Praising in Abu Al-Hassan Tahami's Poems

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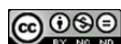
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ABSTRACT

Hassan Tahami is one of the poets of the Abbasid period. Novelty of interpretation, emotional expression and coverage of various contents are some of the characteristics of his poetry. He praises about 30 peoples of rulers and princes of Al-Jarrah; including Hassan bin Mofarraj, Mofarraj Ben Daqfal and two of his children, Abby Maqrebi Wazir, Mohamed Ben Nasibi, and so on. Tahami often turned to exaggeration in his commends praising, but Nasib and lyricism of his odes are truly beautiful, pleasant and Sensational; and sometimes there are signs of innovation. Although his poetry was written often about to praise the people; however, wisdom and aphorismit has always been used in his poems. This article has been written by the aim to examine praise in Hassan Tahami's poems.

Key Words: Hassan Tahami, the Abbasid Era, Praise, Forgiveness.

INTRODUCTION

One of the characteristics of the pre-Islamic Arabs is to be proud of their fathers, forebears and tribal elders; thus to do this they write and compose poems.They praised their fathers and their elders and paid satire and derision about other tribes; so the history of praise in Arabic literature returns to the days of ignorance (the pre-Islamic Arabs). After rising of Islam and started the mission of Prophet Muhammad, peace be upon him and his progeny, praise of him and then the Caliphs was widespread; therefore, panegyric writing spread in the era of the Umayyad caliphs. The Umayyad Caliphs to stabilize position and legitimize their ruling, as well as forging Hadith, also wanted the poets to praise them, and this trend continued in the Abbasid era.

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Abbasid exaggerated about scholars and poets and respect them a lot; gather with them and assign them to higher positions. Also, in some big cities of the country the perused the Abbasid Caliphs and the rulers of the cities were in compete with each other in attract the poets. Eulogy was widespread; and this is counted as one the significant literary characteristics of that era. Some of great poets as Bohtari, Ebn Al-Rumi, and Ebn Al-Mohtaz were before Motnabi, and Abu Foras, Al-Sharif Al-Razi, Abu Al-Hal-e Al-Moarri, Ebn Nabat-e Al-Saadi, Mahyar Al-Deylami and Abu Al-Hassan Al-Tahami after Motnabi were busy with panegyric and eulogy (Foran, 1990: 14). In terms of literary, eulogy means a speech or piece of writing that praises someone or something highly, by the good and beautiful traits.

Talk about the history of the praise and eulogy among humans as a poetic techniques is very difficult and certainly, like poetry, its initiation is unknown. The human desire to eulogizing their orientation is an instinctive thing and basically every one enjoyed of self praising and with pleasure likes to be praised and appreciated by the others; as if the generosity, courage, chivalry, justice, charity and so on moral virtue given to someone, he/she would have a happy face and mind and may be a source of pride to him, although it is not in him/her virtues (Tabrasi, 1933: 1/12) Obviously, eulogy examples is not common in humans and other animals, but they're only his own attributes, such as wisdom, modesty, justice and courage; so each poet that praise someone based on such attributes, praised him/her truly and if praise him/her in another way, the poets walked on the wrong way (Alqeirowani, 1959: 131/2)

However, for the motivation of praising, admiration and addressing of another human has been said a lot in books which are limited and listed in four factors: amazing, acknowledgment, fearing and doing business.

The Importance and Necessity of the Research

Hassan Tahami is one of the well-known poets of the Abbasid era. Without a doubt, on his era, praising and eulogy reached its peak and there is no poet who to achieve wealth or reputation didn't pay to praise Amir or a highness. On that period, the court of the rulers and princes were full of professional and merchant poets. Abu Al-Hassan Tahami's poetry certainly is no exception of that. However, his panegyric ode, regardless of the form of eulogy poems contains instructive words and moral percepts as well. Hence, it is necessary to study specific ways of Hassan Tahami's poetry and eulogy.

Research Questions

Research Questions are:
- What is the status of eulogy and panegyric poetry in Abu Al-Hassan Tahami's poems?
- What methodology he has taken in panegyric poetry?

Praise in Tahami's Poems

Although most of his poems have been composed about praise, he has been always used wisdom and aphorism too. Everywhere and on every occasion, Tahami combine eulogy with instructive words and moral percepts to compose a good poem respectively. Tahami in a beautiful ode pay to praise Abu Omar Mohammed Ibn-e Hussein-e Baboli, which is discussed in this article.

Tahami begins his ode with describing lover and her beauty and addressed his beloved and says:

صَدَدْتَ إذْ عَادَ رَوْضُ الرَّأَسِ ذَازَهَرَ   الشَّيْبُ عِندكِ ذَنْبُ غَيرُ مُغْتَفَر

(التهامی، 1986 : 178)

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When the garden covers by the blooms [graying hair (aging)], you turned me [and I came to the conclusion that] old age in the mind of you, is an unforgivable sin. He condemned aging and graying hair that is the cause of distance and separation from his beloved person so pray and seek to destroy it:

<div dir="rtl">

لا دَرَّ دُرَّ بَيَاض الشَّيبِ إنْ لهُ   في أعْيُن الغِيدِ مِثْلُ الوَخْز بالإبر

(همان)

</div>

Showing imagination and poetry processing, Tahami by composing some beautiful verses try to describe her beloved; and at the beginning of the ode writes a lyrical romance:

<div dir="rtl">

يَخْنسنَ بَيْنَ فُرُوج المعْلَمَاتِ كَمَا   يَكْنسنَ بَين فُرُوع الضَّال وَالسَّمُرُ

(همان)

</div>

[Beauties] are hidden among the marked holes as [roe] is hidden between the branches of cedar and Samar [fear from predators].

<div dir="rtl">

فَبَاتَ يَجْلُو لنَا مِنْ وَجْهِهَا قمَراً   مِنَ البَرَاقِع لوْلا كُلْفةُ القمَر

(همان)

</div>

Under the guise appeared cheeks like moon (of lover) for us [her cheeks are as beautiful month] if it did not spot on month.

<div dir="rtl">

وَرَاعَهَا حَرَّ أنفاسي فقُلتُ لـهَا   هَوَايَ ثارٌ وَأنْفاسي من الشَرَر

(همان : 179)

</div>

Warmth and heat of my breath surprised him and I told her that my love is like a fire and my breath is flare and spark of my heart fire.

<div dir="rtl">

وَزَاد دُرَّ الثَّنَايَا دُرُّ أدمُعِهَا   فالتفَّ مُنْتظِمٌ مِنـهُ بمُنْتَثِر

(همان)

</div>

Gem of her teardrops, expands the pearl teeth (by seeing the lover spittle poured with tears) and saliva and tears were mixed together.

<div dir="rtl">

فمَا نكرْنَا مِن الطّيف المُلِمِّ بِنا   مِمَنْ هُوَيْناهُ إلا قِلّةَ الخَفر

(همان)

</div>

We took an opportunity by the dream (of lover), by the things we liked; however, we were denied all of them because of modesty.

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<div dir="rtl">

مِنَ الرّضَابِ اللّذيذِ البَاردِ الخَصِرِ
(همان)

بَاتَتْ تُبيحُ لَنَا مَاالا تَجُودُ بهِ

</div>

Taking a chance for me to eat her delicious and cool saliva [make pleasure of that] but [at the other times such an opportunity for me] didn't make to exist.

<div dir="rtl">

وَالجَوَُّ رَوضٌ وزَهْرُ اللَّيلِ كَالزَّهرِ
(همان)

فَسِرْتُ أَعْثُر في ذَيلِ الدَّجَى وَلَهاً

</div>

After I had gone, while [from the intensity of love] in the edge of dark I was gaga and mad; the wild weather was as a garden and evening star like blossom [was shining].

Unique Love

After describing the beauty, glory and tranquility of the night and comparison with her beloved person, Tahami again paid to praise her to reach the goal of eulogy:

<div dir="rtl">

فقلت خبركِ يغنيني عن الخبرَ
(همان : 182)

قالت أنساك نجداً حبٌ مطرف

</div>

[My beloved] said: new love will take from you the land of freedom. I reply, there is no need to news but your news. In a debate between him and beloved person, he points out that his love is unique and except love for God and her, there is no sense of love at all for others:

<div dir="rtl">

فكيف أهوى بلا سمع ولا بصر
(همان)

أخذتِ طرفي وسمعي يوم بينكم

</div>

[My Love] on the day of departure, you take my eyes and ears too; so without eyes and ears, how could I fall in love with [the others] anymore.

<div dir="rtl">

هل فيه غَيرك من أنثى ومن ذَكر
(همان)

وقد أخذتِ فؤادي قَبلُ فاطلعي

</div>

Before [eye and ear] you stole my heart, then see, could you find any man or woman except yourself?

<div dir="rtl">

إلا هواك فلا تبقي ولا تذري
(همان)

فإن وجدت سوى التوحيد فيه هوى

</div>

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Except the love of Allah, if you find any sense of love but to you, then no [interest and relevance of me] left for you.

الطول منه وحسن الليل في القصر
(همان)

بيضاء يسحب ليلاً حسنهُ أبداً في

[Meet the] white and beautiful woman [lover] at night cause to happiness by its extension (when night becomes longer, longer happy with her visit) and night less [her beauty in a short period of night] (and covers it).Then Tahami composed again verses about the benefits and beauty of his beloved, finally he mention ambition of her:

في اللون والريح والتفليج والأشر
(همان)

يحكي جنا الأقحوان الغضَّ مبسمها

Fresh lips [of beautiful beloved] in color and smell and the gap between them and the sharpness are like chamomile [her teeth comprised to the sharp leaves of chamomile].

ما كان يزدادُ طيباً ساعةَ السحر
(همان : 183)

لو لم تكن أقحواناً ثغرُ مبسمها

If teeth and his mouth were not like chamomile, at dawn, the smell of her doesn't rise.
The poet by composing the below verse tries to describe the beloved characteristic; on that he comparison her beauty and glory among pretty, slim and tall girls as the superiority of Abu Omar's hands over the rain and said:

كفّا الرئيس أبي عمرو على المطر
(همان)

لها على الغيد فضلٌ مثل ما فضلت

Her superiority over beautiful and good looking girls is like as the vantage of Abu Omar's hands over the rain.

Forgiveness and Magnificence of the Praised Person

Words such as generosity, magnificence and freedom has significant place in the poems of this poet. The importance which he gave to these concepts; hence, in almost all his description, he attribute generosity and magnificence for the praised person; i.e., the donation and beneficence.

It can be said he stated this issue outstandingly and describe this feature of human being in a distinguished manner; and not only satisfied with this but try to encourage the other to attribute by them:

فهل يباريهما في الجود بالبدر
(همان)

وهبُة باراهما في غُزر نيلهما

His forgiveness (the praised person) is more than both of them (Beautiful Girls and rain) in diversity and abundance. Her forgiveness is equal to give thousands of dirhams.

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في قالب المجد لا في قالب البشر	ذو صورة أفرغَ الرحمنُ صيغتها
(همان)	

She (the praised person) has the form and the image which the Lord shed and shaped her in glory and eminence not in human form.

ومالهُ وثناهُ العض في سفر	فمجده ونداه المحضُ في حضر
(همان)	

Her pour forgiveness and eminence is in his house (i.e. heart) [not elsewhere]; her wealth, adoration and admiration are in her nature and traveled [to anywhere] (forgiveness and eminence do not separated from her, but his wealth by donating to people separated from her and scattered among the people).

In the following verses, Tahami stated the high amount of generosity and goodness of his praised person that this forgiveness and kindness takes in secret; and also said the esteem of a young woman depends heavily in her covering and modesty; therefore the value of a good work is in which it shall be hidden from the sights (of people):

كما يزيد بهاء الخود بالخفر	يزيد معروفهُ بالستر منزلة
(التهامى، 1986 : 185)	

The value of her goodness increases by hiding from the sight (of people) as the esteem of a young woman increases heavily with the severity of her modesty.

ترقرقَ الماءِ في الهنديَّة البتر	ترى مياه الندى تجري بأنمله
(همان)	

Watch giving water which is streaming on her fingers as like shining water over Hindi's sharp sword (her forgiveness is for those who raised her and her sword is for those who hate her).

Honor and Eminence of the Praised Person

Adoration of honor and eminence of the praised person is another issue which is significant in Tahami's poems. Literally, the word of glory has been praised. Glory means dignity, honor, greatness and kindness inherited from the ancients.

He praised the patience and meekness of the beloved and believes that patience and decisive character have valuable results; he says older people has more experience, and more than the others deserve patience and meekness, so they shall be appreciated and praised them by everyone. He believes a decisive character of a man shows his strong character:

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إن الفرند دليلُ الصّارم الذكر   وماء وجه ينبّي عن صرامته

(التهامى، 1986 : 183)

Honor and dignity shows her strong character as the sword because of the strong tempered steel and iron is good. Tahami describes his beloved like the sea and even higher than it. In his view, the sea sometimes will be stormy, but his praised would always be smooth and clear:

والبحر منبعثٌ بالصفو والكدرَ   بحرٌ ولكنهُ تصفو موارده

(همان)

[She is] the sea, but her heart is smooth and clear; [But she does not like the sea because] the sea [waves are sometimes] smooth and sometimes dark.

The poet resembles his beloved forgiveness as the sea greatness and it's precious and points out the sea gives precious pearls, therefore Abu Omar's granting are as precious as the pearls:

فليس يُنكر قذفُ البحر بالدّرر   لا تنكرنَّ نفيساً من مواهبه

(التهامى، 1986 : 184)

Certainly not deny the virtue of precious gifts of him, as it cannot deny throw pearls by the sea.

The poet knows Abu Omar dare and brave by his precious gifts. In other words, he believes Abu Omar is strong when granting and his hand and heart not shake of that:

محلّ دانِي الندى مستحكم المرر   صعبُ الإباء ذليلُ الصفح مبتعد الـ

(همان)

[He] was very refusal, patient and out of reach and his granting is close to courage.

Uniqueness

The describing praised person by Tahami has unexampled and unique:

لقد طلبت محالا ليس في القدر   يامن يرومُ لهُ شبهاً يشاكلهُ

(همان)

You who want to find a similar person and example like him, [do not bother yourself because] you want an impossible things and it's not in your patience and ability.

By his look, Abu Omar is a mean to identify the origin and his generosity. The poet says, generosity and decency is a sign of his good principle, as the favorite smell testimony for a good fruit:

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عرفتُ آباءه الشمَّ الكرامَ به   كذاك يعرفُ طيب الأصل بالثمر
(همان)

I knew his noble and generous ancestors because of him, as the original and fragrance known by its fruit.

Praising the Tribe of Beloved

The poet describes the beloved tribe and reminds greatness, generosity and goodness of ancestors of the praised person:

قوم علواو أضاءوا الأفق واتصلت   أنواؤهم كفعال الأنجم الزُهر
(همان)

[They] were people who rose and [with their good deeds] bright the horizon and their shining reached [to the earth at dark nights] like the stars.

Then, Tahami admired visiting and seeing the beloved closely and describes it as a source of pride for himself:

قد كنت أهواهُ تقليداً بمخبره   فصرت أهواهُ بالتقليد والنظر
(همان)

I loved him [Already] by the narrative of others, but [now] I love him by hearing and seeing.

وكنتُ أكبره قبل اللقاء لهُ   فازددت للفرق بين العين والأثر
(همان)

Before meeting and see him, I thought him great (I bow) [but now I respect more than it was] and seeing him [my respect to him] because of there is a lot difference between seeing with the eyes and narrative.

The Praised Courage

Other issues which Tahami consider a lot to about the praised person are bravery and courage of him/her:

لولاهُ لم يقض في أعدائه قلمٌ   ومخلب الليث لولا الليثُ كالظفر
(همان : 186)

If he did not, no pen would judge about his enemies [in describing the hitting strikes] (do not hurt the enemy) if the lion don't exist its claw would be like as a nail.

فيه المنى والمنايا كالشجاع به الدرَيا   قُ والسمُّ جمَّ النفع والضرر
(همان)

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There is wish and death in his mind (the praised) as a courageous man (both benefit and harm) and (like a viper snake) stored venom and antidote.

<div dir="rtl">

في الـهام أو سمُر الأرماح في الثغر   ما ضرّ إلا وضلت بيضُ أنصله

(همان : 187)

</div>

Only loss and hit in the battle [with the enemies] his arrows would get to their heads [of enemies] and spears get to their mouth [will be leave it on].

<div dir="rtl">

ضرب كما حفّت الاعكان بالسّررَ   وغادرت في العدى طعناً يحفُّ به

(همان)

</div>

[This swords and spears] make strikes over the enemies which covered its affects, so that the belly meat covered cord.

Failure to Describe the Praised Person

In some cases, Tahami's language and his words fail to praise; therefore, he says splendor, greatness, honor and forgiveness of him has more scope than it to describe by words. Language has not the capacity of describing your greatness and fails to mention your generosities.

<div dir="rtl">

في سلكِ لفظٍ قريبِ الفهم مختصر   يارُبَّ معنىً بعيدِ الشأو أسلكه

(همان)

</div>

Ironically, I want praise you by words so in a series of short term and in order to simply understanding it, I will compose it.

However, he believes that to describe the greatness of the praised person pick up the best word and states, but he again mention that they're fail to describe him:

<div dir="rtl">

ما بين منزلة الإسهاب والخصر   لفظاً يكونُ لعقد القول واسطة

(همان)

</div>

I choose words which mediated, long and short (between them).
In his circle of thoughts, the words and granting would be equal:

<div dir="rtl">

والجود فالتقيا فيه على قدر   إن الكتابة سارت نحو أنملهِ

(همان)

</div>

Words go toward the [granting] of her fingers and by donating met each other (the words spoken in praise of you are near to your granting).

And goes to somewhere that knows the pen in the hand of the praised as like spear and as the spear in her hand is obedient, pen is also subservient for the praised:

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عكساً كعكس شعاع الشمس للقمر   تردَ أقلامهُ الأرماحَ صاغرةً
(همان : 188)

His pen, obedient the spears and vice versa returns it that reflected [it] as a reflection of sunlight on the moon. Tahami believes the blackness of pen and ink refines clear meanings and noble traits of the praised:

إن الظلام ليجلو رونق السَّحر   يجلو بياضَ المعاني سودُ أحرفها
(همان)

Whiteness and clear meanings, polished blackness letters; and expressed that the beauty and the freshness of the morning, bright the darkness.

However, he apologized again because of the words that he used to describe the praised; and says that he tried to use the highest and most beautiful words and arrange them in appropriate shapes and utilized the best meanings of the term:

من المحاسن ما في أحسن الصُّور   وفي كتابك فاعذر من يهيمُ به
(همان)

[Oh Praised] by the words [related to your praise] accept the excuse of someone who will randy towards its beauty, [because those words] in the most beautiful form [have written].

CONCLUSION

First, contrary to what is thought to be the poet and flatter of princes and rulers or from the appearance of his poetry such an interpretation has realized, but Abu Al-Hassan Mohammed Tahami do not only the flatter of the rulers, but even among his flattering and praising speak about moral percepts for the rulers and princes; so for any occasion which he composes odes without exception used advice, wisdom and preaching and include them to his beautiful states which shall be praised and appreciated.Second,Tahami includes many of the themes of moral and legal concepts on his poems as human dignity, honor, greatness, tolerance, forgiveness (granting), instability of world, denounce of poverty and ignorance; therefore and undoubtedly you can consider him as poet of wisdom and taught from his wisely advices and tips; hence, they shall be attached to valuable philosophy of Arabic poetry.

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RESEARCH ARTICLE

Determining Best Advertising Media in Banking System based on Customers Need using a Multiple Criteria Decision Making Approach: Case Study of Mellat Bank in Iran

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ABSTRACT

Today, the numbers of banks are increasing. This has led to creation of a competitive environment for attracting customers, service offering and modern banking solutions. One of the most important methods of attracting customers is effective advertising using media. This study attempts to find best advertising media according to customers' needs. For this purpose we used multiple criteria decision making approach. The statistical population of this study was management branches of the free trade-industrial zones of Mellat Bank in Iran. Customers were categorized as retail, private, commercial, and corporate banking customers. pairwise comparison using AHP method, the most effective criteria were identified, and then advertising media were ranked. The results of the criteria analysis showed that *offering credit services* was the most important criterion in finding the best advertising media. We found that *online advertising* was the first rated advertising media.

Keywords: advertising media, customers' needs, multiple criteria decision making, Analytic Hierarchy Process,

INTRODUCTION

Banks as the manufacturing organizations supporters play an important role in the success or failure of an economic system(Lazarus and Folkman, 1984). Increase of the number of banks in one hand, and the increase of competition rate in attracting customers on the other hand, has caused the bank managers to take various steps towards making

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their advertisings effective. In today's world, advertising does not mean cost but if we think about the advertising achievements, we will realize that an organization is successful that is able to put more efficient and creative advertisings on its agenda. Nowadays, organizations are looking for a way to differentiate themselves from the other organizations, and create a positive image in customers' minds. Actual product or service is only one aspects of what is required to meet the needs. The way of product offering, the place where the product is offered, and the image of the product in the customer's mind are as important as the product, and if they are ignored, selling a product or service will fail(Kotler and Armstrong, 2004). If banks can target customers' fundamental and essential needs, and find an easy, useful solution to meet the needs by advertising, an increased number of customers and loyalty will be resulted in long term. According to the major changes in banking industry, change of thoughtabout development and marketing new banking products using innovation has led to the promotion of bank's status in banking network as well as increase in market share. Besides developing some strategies for attracting new customers, banks should retain their current customers, and make a permanent relationship with them. If the Customer Relationship Management(CRM) system be designed and implemented accurately, it will lead to full understanding of customers.

Stevenson(1989) identified generic basic needs of customers using financial services as follows:
- (a). The need for money(loans)
- (b). The need to a return on money (saving and investment)
- (c). The need to move money (money transmission)
- (d). The need to manage risk(insurance)
- (e). The need for information
- (f). The need for advice or expertise

Harrison (1994) determined five levels of a hierarchy of financial needs of customers as foundation products, emergency cash reserves, risk management, growth to offset inflation and risk& tax protection. Rundle-Thiele (2005)introduced fourstatuses for the customers who may be: loyal and profitable, loyal but not profitable, profitable but not loyal, and neither loyal nor profitable.*European Foundation for Quality Management* (EFQM) presented a model called European customer satisfaction index (ECSI) to measure the satisfaction of customers with seven latent variables which are: image of the organization, customer expectations about the organization, perceived quality of the products and services of the organization, perceived value of the quality/price relation, treatment of the complains, and customer loyalty.If the sum of thesevariablesbe more or equal to the cost that customers pay for, it can be expected he/she is satisfied with their purchase. To attract customers to bank, some criteria should be considered, because attracting anyone as customer is not profitable for the bank. These criteria can be:affordability, ethics, reputation, worthiness, qualification, occupation, and bank interest protection.

According to the intense competition amongbanks, rapid growth of markets and fast changes in customers' behaviors, advertisement is considered to be a main tool in customer awareness of the products and services. Advertising is any paid form of nonpersonalpresentation and promotion of ideas, goods, orservices by an identified sponsor. It involves the use of such media as the following: Magazine and newspaper space, Motion pictures, Outdoor (posters, signs, skywriting, etc.), Direct mail, Novelties (calendars, blotters, etc.), Radio and television, Cards (car, bus, etc.), Catalogues, Directories and references, Programs and menus, & Circulars. Due to the unique effects on audiences, various media bring different responses. Many advertisers follow five M's of advertising: mission, money, message, media and measurement. A most common used communication model that helps organizations to motivate customers by advertisements in purchasing products or services isAIDA model whichstands for attention, interest, desire, and actionused in marketing and advertising coined by Elias. St. Elmo Lewis in the late 1800s which helps marketing managers develop effective communication strategies and communicate with customers in a way that better responds to their needs and desires.

Since advertising is a costly job, it is necessary to be chosenand prioritized achieveeffectiveness,so in this paper, according to the customer and experts' points of view about the effectiveness of common advertising media in bank

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performance, the aim is to prioritize advertising media based on banking needs of customers using multiple criteria decision makingapproach.

MATERIALS AND METHODS
Decision-making

In fact, decision-making is one of the most important and essential management tasks, and achieving organization goals depends on its quality such that such that according to Herbert Simon (1977), decision-making is the essence of the management. According to him, decision-making andmanagement are similar terms. Drucker (1987) believes that the emphasis of the future management is on decision-making process and its understanding. According to Rausch(2005), effective decision-making involves the following steps:

i.   Defining issues to be addressed
ii.   Identifying alternatives
iii.   Finding relevant information
iv.   Evaluating the alternatives
v.   Selecting the most desirable alternative
vi.   Implementing the alternative
vii.   Monitoring the progress of the implementation towards the desired outcome

Two important techniques of decision making are Multiple Criteria Decision Making (MCDM) and Fuzzy Multiple Criteria Decision-Making(FMCDM).

Multiple Criteria Decision Making

In MCDM methods, which have received considerable attention in recent decades, instead of using one criterion of optimality, multiple criteria are used (Bashiri et al, 2011).MCDM consists of a finite set of alternatives, from among of which the decision-makers should choose, evaluate or rank an infinite set of criteria. There are several methods for solving MCDM problem such as VIKOR method, Analytic Hierarchy Process (AHP). MCDM is used due to four following reasons:It is logical and understandable;its computational processes are easy;It allows access to the best alternatives of each criterion in a simple mathematical formula; and the importance of criteria can be investigated by weighting figure(Wang and Chang,2007).

Fuzzy Multiple Criteria Decision-Making

In traditional MCDM, criteria weights are determined but due to ambiguity and uncertainty of decision-maker statements, presenting data certainly is inappropriate. Since the human's judgments cannot be estimated bythe exact numerical values and are usually ambiguous, traditional MCDM method cannot be used to solve such decision-making problems.

In recent years, considerable attempts have been made to solve such ambiguities and uncertainties, leading to use fuzzy set theoryin MCDM methods (Tseng et al, 2011). From when Bellman and Zadeh (1970) developed the theory of decision behavior in a fuzzy environment, various relevant models were developed, and have been applied to different fields such as control engineering, artificial intelligence, management science, and Multiple Criteria Decision Making (MCDM) among others. The concept of combining the fuzzy theory and MCDM is referred to as fuzzy MCDM (FMCDM). The concept of combining fuzzy theory with MCDM refers to the FMCDM(Wu et al, 2009) .

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Analytic Hierarchy Process

One of the first MCDM methods is Analytic Hierarchy Process. AHPwas first developed by Saaty(1980). It is based on three principles: constructing the hierarchy; priority setting, and logical consistency.First a complex decision problem is decomposed into alternatives in the hierarchy. Then, priority of these elements is determined by a pairwise comparison judgment matrix.In AHP, multiple pairwise comparisons are based on a standardized comparison scale of nine levels range from 1=equal importance to 9=extreme importance.The result of the pairwise comparison on *n* criteria can besummarized in a *(n ×n)* evaluation matrix *A* in which every element *aij* is the quotient of weights of the criteria.Relative priorities are given by the right eigenvector (ω) corresponding to the largest eigenvector(λ_{max})as below:

$$A\omega = \lambda_{max}\omega \qquad (1)$$

When pairwise comparisons are completely consistent, the matrix *A* has rank 1 and $\lambda_{max} = n$. In that case,weights can be obtained by normalizing any of the rows or columns of *A*.

In next step we should check the consistency of the pairwise comparison using consistency index (CI) defined as below:

$$CI = \frac{\lambda_{max} - n}{n - 1} \qquad (2)$$

Final consistency ratio (CR),is calculated as the ratio of the CI and the random consistency index (RI) shown as:

$$CR = CI / RI \qquad (3)$$

The number0.1 is the accepted upper limit for CR. If the final consistency ratio exceeds the number, the evaluation procedure hasto be repeated to improve consistency(Wang and Chang, 2007).In this study, for AHP analysis, we used *Expert choice* software.

Methodology
Statistical population

The main aim of this study is to prioritizing the advertising media based on the customers' bank needs in Mellat bank located in Iran using MCDM approach. Thestatistical population was consisted of 25 senior managers, experts and professionals in Mellat Bank. Censustechnique was used for sampling since participants wereunknown. Saaty(1989) believed that 10 experts are enough to conduct a study based on the pairwise comparison. In addition, Khorramshahgol andMoustakis (1988) suggested a total of 5-10 experts. In this basis, finally we selected 5 experts as study sample.

Data collection

Library and field studies were applied to collect data usingtwo questionnaires:
1. 43-item inventory based on 5-point likert scale for determining most important criteria;
2. Expert inventories (a, b): (a) to weight the main criteria and (b) to prioritize items.The questionnaires werebased on the 9-point ratio scale introduced by Saaty(1978) designed by AHP method using pairwise comparison. By use of this model, the relative importance of criteria is rated according to Table 1.

For testing their validity, we used opinions of professors and experts in the study area, or reviewing similar questionnaires. Also we tested their reliability using Cronbach's alpha whose value obtained as 0.825 which shows their high reliability.

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Main study criteria

Four types of customers were identified as the main criteria in hierarchical tree model including customersof private, retail, commercial and corporate banking. These four main criteria first had 42 subcriteria. Since its number is high, we used questionnaire No.1 applying decimal weight and normalized phase in EXCEL. After exporting, the most weighted criteria were chosen, and finally 17 criteria were selected. The final tree model is shownin figure 1 where criteria are used to prioritize advertising media with 4 groups of customers and 5 media.

Collected data analysis

To analyze data collected by the questionnaire, the criteria were weighted using AHP method in Expert Choice software, and the alternatives were prioritized. The steps of this method are presented completely in the next section

RESULTS AND DISCUSSION

In this study, as mentioned before, we used Expert choice software to prioritize advertising media. After creating tree diagram in software, data collected by the questionnaire were entered into pairwise comparison matrix. In this process, it would be better to use geometric mean to convert the participants' points of view into a unit number. It should be noted that prioritization consisted of three stages: (a) Prioritizing customers in selecting advertising media, (b) Prioritizing the criteria related to each customer in selecting advertising media , and (c) Prioritizing each advertising media based on the customers' needs considering the criteria

Prioritizing types of customers

Table2shows the inputs for prioritization of each customer. As can be seen, inconsistency ratio is 0.05 which should be about 0.1 or less. According to these inputs, relative weights of four types of customers were determined shown in figure 2.

According to Figure 2, customers of corporate, private, commercial, and retail banking respectively, are important in finding best advertising media.

Prioritizing the criteria related to each customer

Tables 3 to 6 show the inputs for prioritization of criteria for each customer.
According to above tables, relative weights of criteria for each customer were obtained using the software.Figures 3 to 6 depicts priorities of the criteria.

Determining best advertising media

Different alternativeswere compared with different criteria, their relative weights werecalculated, and criteria wererankedconsidering their weights in comparison with subcriteria'sshown in table 7.

Based on table 7, we can say that "offering credit services" has the highest importance in determining best advertising media by customers in banking system.According to this table, the result of finding best advertising media is as follows:

Face-to-face advertising (A5) <radio advertising (A2) < newspaper and magazines (A4) = TV advertising (A1) < online advertising A3

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Accordingly, Mellat Bank'spriorities in using media for advertising to communicate with customers more efficiently are illustrated in Figure 7

As can be seen in Figure 7, *online advertising* has the highest priority for the study bankin order to communicate with their customers (81%), and face to face advertising were the least important method for them (9%).

CONCLUSION

The aim of this study was to prioritize the advertising media including TV, radio, internet, newspapers and face-to-face advertising considering the customers' needs in Mellat bank based on MCDM method. Participants were 25 senior managers, experts and professionals in Mellat Bank.First 4 types of customers were defined including retail, private, commercial, and corporate banking customers. Using AHP method, we found out that corporate banking customers were the most important types of customers for finding best advertising media.

In the current study, the important criteria were also identified for determining the priority of advertising media in banking system, and by using fuzzy MCDM, theywere ranked in order to be helpful in making customers aware of products and services resulting in gaining competitive advantage between banks due to rapid growth of market and rapid changes in consumer behaviour. We weighted the most important criteria using AHP method and conducting pairwise comparisons. Accordingly, 17 criteria were identified. Our results showed that offering credit services tailored tothe current affairs of the companieswas the most important criterion related to corporate banking system. This indicates that this sector of financial services has allocated a considerable part of the assets. Also the criterion of pose services had the least importance with respect to our goal.Finally, after performing AHP technique in*Expert Choice* software, the prioritization of five media wasdetermined as following: 1- online advertising, 2- TV and newspapers (shared palce), and 3- face to face advertising.

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Table 1.Scale of relative importance using AHP

Intensity	Definition
1	Equally preferred
2	Weak
3	Moderately preferred
4	Moderate plus
5	Strongly preferred
6	Strong plus
7	Very strongly preferred
8	Very , very strong
9	Extremely preferred

Table2.Comparing the relative importance with respect to prioritizing customers

	Retail banking	Private banking	Commercial banking	Corporate banking
Retail banking		3.554	1.38	7.114
Private banking			1.31	5.809
Commercial banking				3.737
Corporate banking	Incon:0.05			

Table 3. Comparing the relative importance with respect to retail banking customers

	Investment saving accounts	Personal and mortgage loans	Debit credit cards	Pose services
Investmentsaving accounts	-	1.488	2.07	4.21
Personal and mortgage loans	-	-	6.434	6.544
Debit credit cards	-	-	-	1.055
Pose services	Incon:0.09			

Table 4.Comparing the relative importance with respect to private banking customers

	Wealth Management	Asset retaining and growth	Retirement plans
Wealth Management		7.74	4.34
Asset retaining and growth			1.325
Retirement plans	Incon:0.08		

Table 5.Comparing the relative importance with respect tocommercial banking customers

	Liquidity Management	Types of Financing	Types of credit cards	Types of payment cards
Liquidity Management		1.333	6.015	4.801
Types of Financing			4.317	5.004
Types of credit cards				3.31
Types of payment cards	Incon:0.08			

Table 6.Comparing the relative importance with respect to corporate banking customers

	Offering credit services tailored tothe company's affairs	Various and special financing packages	Granting credit lines to the organization	Working capital facilities	Foreign exchange services	Financing
Offering credit services tailored tothe company's affairs		3.708	1.732	2.59	1.236	2.048
Various and special financing packages			2.231	2.943	1.968	1.316

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Granting credit lines to the organization				1.158	1.065	1.848
Working capital facilities					1.427	1.495
Foreign exchange services						1.848
Financing	Incon:0.08					

Table 7.Relative weights and priority of consumers, criteria and subcriteria in finding best advertising media in banking system

Main criteria/ weights	Relative weights of subcriteria		Final weights
Retail banking customers /0.073	Investment saving accounts	0.374	0.027
	Personal and mortgage loans	0.443	0.0.32
	Debit credit cards	0.101	0.007
	Pose services	0.081	0.006
Private banking customers /0.17	Wealth management	0.743	0.126
	Asset retaining and growth	0.128	0.022
	Retirement plans	0.129	0.022
Commercial banking customers /0.127	Liquidity management	0.46	0.058
	Types of financing	0.361	0.046
	Types of credit cards	0.115	0.015
	Types of payment cards	0.063	0.008
Corporate banking customers(investment) /0.63	Offering credit services tailored to the organization's current affairs	0.298	0.188
	Various financing packages	0.216	0.136
	Granting credit lines to the company	0.126	0.08
	Working capital facilities	0.111	0.07
	Foreign exchange services	0.102	0.065
	Financing (short-term, mid-term and long-term)	0.147	0.093
Total score		4	1

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Figure 1. Tree diagram of the study criteria and subcreteria
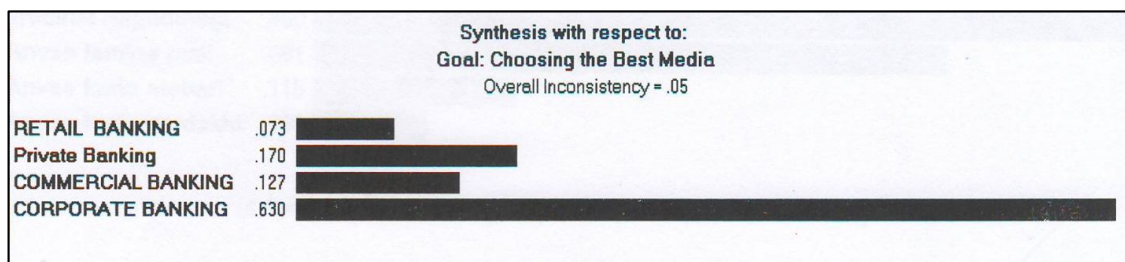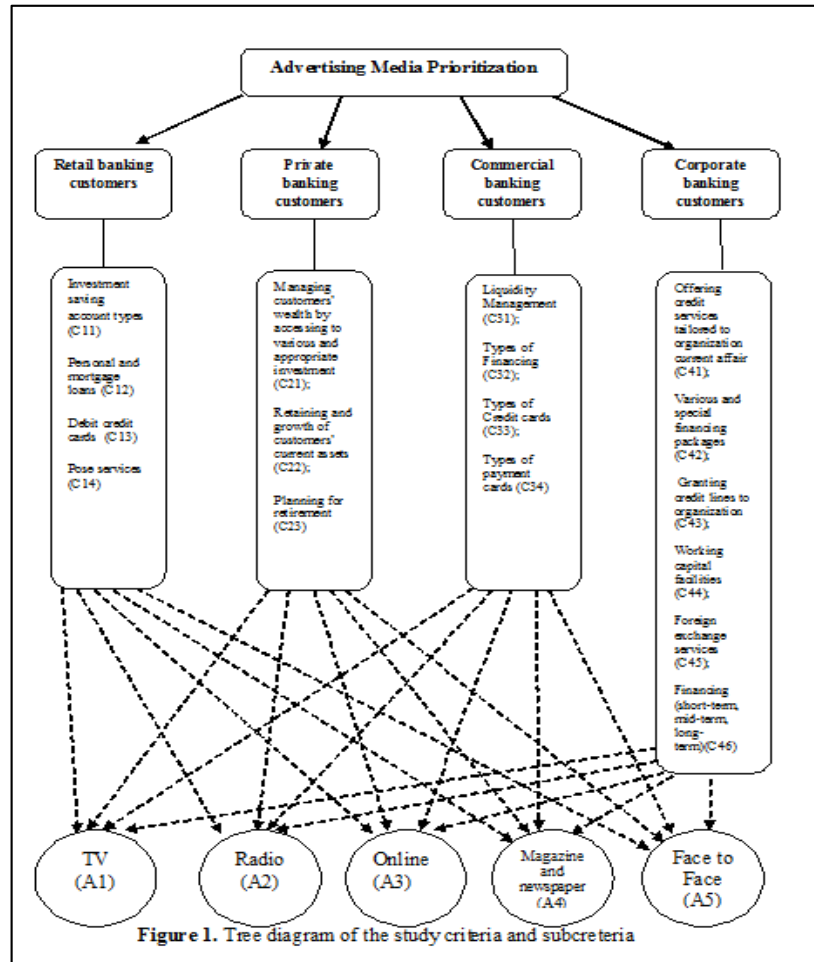
Figure 2.Priorities of the customers' type with respect to goal

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Synthesis with respect to: RETAIL BANKING
(Choosing the Best Media > RETAIL BANKING (L: .073))
Overall Inconsistency = .09

Investment saving accounts	.374
Personal and mortgage loans	.443
Debit credit cards	.101
Pose services	.081
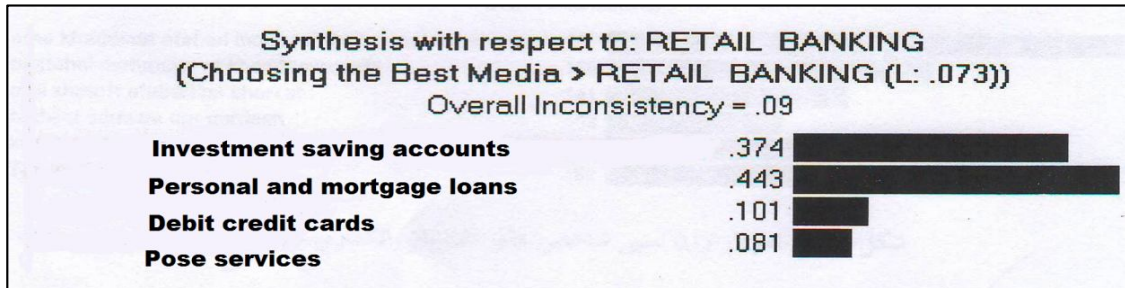
Figure 3.Priorities of the customers'criteria with respect to retail banking type

Synthesis with respect to: Private Banking
(Choosing the Best Media > Private Banking (L: .170))
Overall Inconsistency = .08

Wealth Management	.743
Asset retaining and growth	.128
Retirement plans	.129
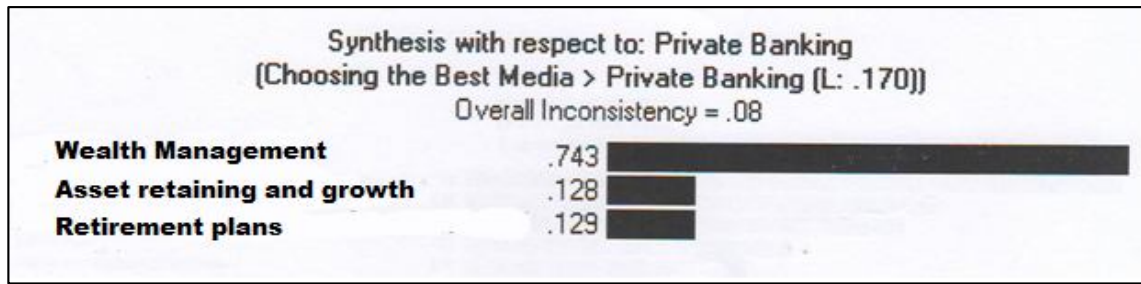
Figure 4.Priorities of the customers' criteria with respect to private banking type

Synthesis with respect to: COMMERCIAL BANKING
(Choosing the Best Media > COMMERCIAL BANKING (L: .1)
Overall Inconsistency = .08

Liquidity Management	.460
Types of Financing	.361
Types of credit cards	.115
Types of payment cards	.063
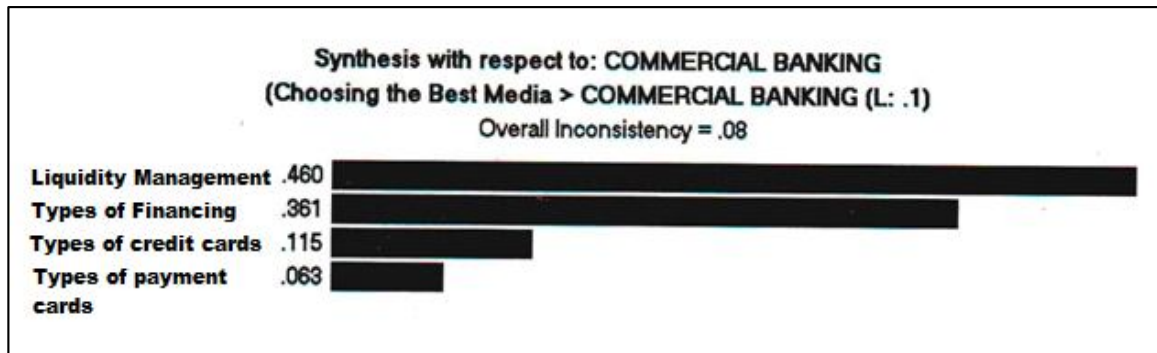
Figure 5.Priorities of the customers' criteria with respect to commercial banking type

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Synthesis with respect to: CORPORATE BANKING
(Choosing the Best Media > CORPORATE BANKING (L: .63)
Overall Inconsistency = .08

Offering credit services	.302
Various financing packages	.189
Granting credit lines to the organization	.141
Working capital facilities	.103
Foreign exchange services	.114
Financing	.152
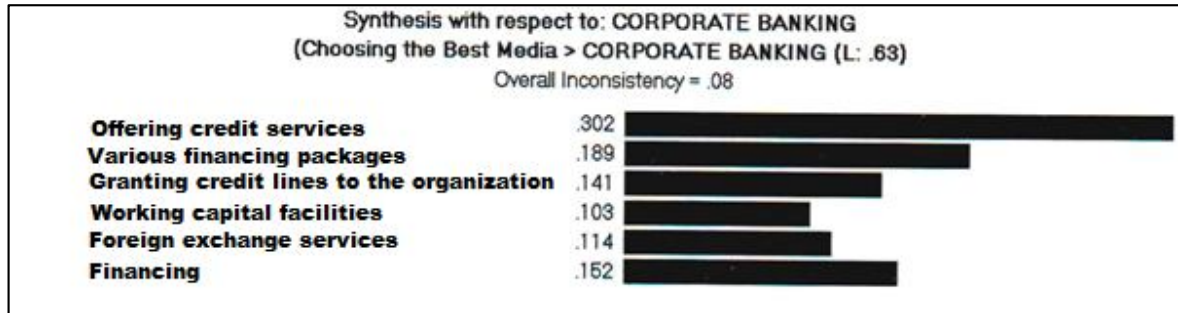
Figure 6.Priorities of the customers' criteria with respect to corporate banking type

Best advertising media

Tv	Radio	Online	Newspaper and magazine	Face to face
0.52	0.21	0.81	0.52	0.09
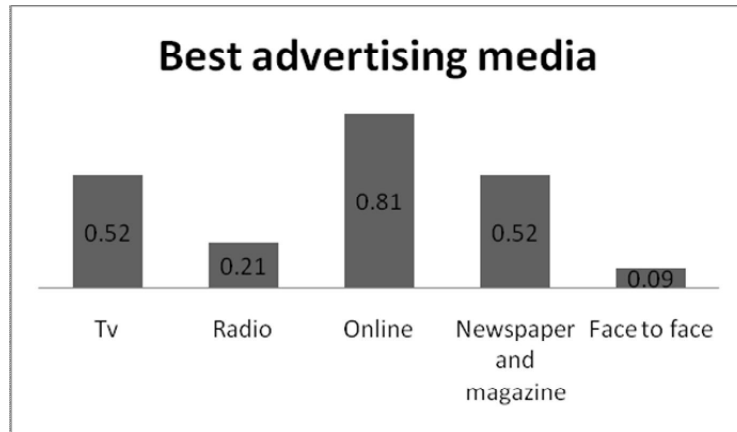
Figure 7. Diagram of most preferred advertising media in banking system

RESEARCH ARTICLE

Effect of Demographic Characteristics on Customer Satisfaction with Electronic Service Quality through Clustering: A Case Study of Social Security Organization

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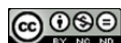
ABSTRACT

Organizations, today, have quickly turned to information technology. Insurance companies are also in line with the evolving automation process and actively provide electronic services to their customers. The important thing is that whether customers are satisfied with these electronic services, and whether all customers with different demographic characteristics such as age, education, income, etc., should be treated equally to attract their satisfaction, or whether these differences will influence the level of customer satisfaction with provided electronic services. This paper uses data mining techniques to improve decision making in various functions of electronic services for insurance companies to provide services tailored to the characteristics of different customers. This study is focused on incentive packages which are automatically offered by the system to the most qualified customers. Initially, customers are clustered based on their profiles. A fuzzy clustering technique is used in this study. Each cluster is formed by customers who have common characteristics based on their historical transactions, and need electronic services proportional to their circumstances.

Keywords: clustering, quality, Social Security Organization

Hasan Shabani and Parham Azimi

INTRODUCTION

Information technology (IT) is evolving rapidly. The Internet has led to the automation world where automated systems have enabled interactive user interfaces. One of the requirements for improving the automated systems is learning and adaptation which are possible using data mining techniques. Insurance companies are in line with this evolving automation process and actively provide electronic services to their customers. During the last 10 years, electronic world has witnessed the emergence of many automatic recommending systems which can provide users with a personalized service recommending different types of products and services. This service allows users to choose the product or service they are interested in, including service packages. In modern competitive world, it is essential to keep up with expectations of consumers, which itself is important to achieve proper quality services. Quality is achieved when the customer needs and expectations are met and these service features need to be measured. In recent years,

the concept of electronic or web-based service quality has emerged with the birth of e-commerce and the ability to monitor and enhance the quality of electronic services has become important (Büyüközkan & Çifçi, 2012). The point here is that, various clients with various age, income and education may have different expectations on electronic insurance services. This will influence their satisfaction with services delivered to them. For maximum utilization of the advantages of electronic services, it is essential to deploy different applications of ICT. Planning for deployment of these applications will not be effective without assessment. Therefore, assessment of electronic service quality is a strategy which allows us to become aware of the quality of different ICT applications and improve the conditions using this feedback (Zahedi & Biniaz, 2008). Services and the quality of services provided to people in Social Security Organization (SSO), as a large complex service organization and the most important insurance department in Iran, are prominent. The views of clients determine the quality of provided services. SSO has always taken effective steps to enhance performance and improve the outcomes in order to take advantages of the latest technologies. Nowadays, advanced technologies absorbed through technology transfer have been of great importance in the basic insurance industry. More than any other time, SSO needs to use electronic services. This study clusters customers according to their common characteristics to evaluate different groups of customers in terms of their satisfaction with the provided electronic services and offer solutions and recommendations on the way these services are provided relative to the characteristics of different clusters. Thus, this study analyzes the concept of electronic service quality (E-SQ) in SSO. Based on differences of clusters, this study suggests accurate decisions to provide better e-services.

Theoretical Background

E-service quality: some scholars have defined e-service quality based on different theoretical assumptions. Some defined service quality as customer perceptions of relative advantage of the organization and its services. Some other defined the quality of services received as a global judgment or attitude dependent on superiority of a service provided. They noted that the judgment of the quality of services reflect the level and direction of the difference between observation and customer expectations (Rajdeep, S., 2010).

SERVQUAL model: SERVQUAL scale acts as a superior method for measuring customer expectations of service quality and includes five scales (physical facilities, reliability,responsiveness, warranty and guarantee, and empathy). Each of these scales has many dimensions which are addressed in the form of statements existing in the standard questionnaire (Martínez & Martínez, 2010). These dimensions involve:

- Physical facilities include working facilities and equipment and communication products. All these provide a picture based on which the customer evaluates its quality.
- Reliability refers to the ability to provide reliable service in order to meet customer expectations.

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- Accountability refers to the tendency to cooperate and help the customer. This dimension of service quality emphasizes the sensitivity and awareness regarding the requests, questions and complaints of customers.
- Warranty and guarantee indicates the competence of staff to induce a sense of confidence to the client toward the organization. Particularly, this dimension of service quality is important in services with a higher risk.
- Empathy means that people are treated depending on their conditions; so that, customers are encouraged that the organization understands them and they are important for the organization.

Parasuraman et al. (2005) developed a new material based on SERVQUAL model for measuring the quality of electronic services. This material is called ES-QUAL scale which addresses different dimensions of electronic service quality. These dimensions include efficiency, system availability, fulfillment, privacy, responsiveness, compensation, and contact.

Literature Review

Parasuraman et al. (2005) developed a new material based on SERVQUAL model for measuring the quality of electronic services. This material is called ES-QUAL scale which addresses different dimensions of electronic service quality. These dimensions include efficiency, system availability, fulfillment, privacy, responsiveness, compensation, and contact. In this paper, a multi-item scale called ES-QUAL is developed for measuring the quality of services provided by the websites where customers shop online. Analysis of experimental data show that the two measures are needed to measure the quality of these electronic services:

1. **Public ES-QUAL scale** is a 22-item scale in four dimensions: efficiency, system availability, fulfillment, privacy.
2. **E-REC-QUAL** is only used for customers who have encountered a problem when receiving service. The scale consists of 11 items in three dimensions: responsiveness, compensation and contact.

The measures were well validated.

Zeithaml (2002) showed that the quality of electronic services would be improved only through understanding customer needs and assessment. Thus, it is very important to measure the quality of service. Zeithaml et al (2002) believe that a basic condition of e-service quality management is to know how customers understand the quality of services. They emphasize that studies on the quality of electronic services must target the perception of customers on the services provided. Siu and Mou (2005) used SERVQUAL model based on which they developed a material to measure quality of internet banking service. Their model consisted of four criteria including credibility, efficiency, problem handling and security. In the literature, there are other studies which have addressed electronic service quality based on SERVQUAL model, including Bressolles and Nantel (2008), Dolatabadi and Pool (2013) and Ariff et al (2013). Shi et al. (2001) used data mining techniques to predict the future behavior of credit card holders in portfolio management. Han et al. (2014) used the data mining techniques to predict disaster assessment and disaster prevention systems to support decision-making. Morales and Wang (2010) examined the performance of data mining techniques to determine a series of proper variables and predict the cancel rate for booking service revenue management.

MATERIALS AND METHODS

The methodology of this study is shown in Figure 1. In the first and second stage, the model parameters are determined. These variables are grouped in two different categories. The first group identifies various dimensions of electronic service quality which are used to define a scale for measuring the quality of electronic services by SERVQUAL model. The second group involves demographic variables and income for classification of different customers or users, which determines the various classes of e-service users in SSO. In the third stage, a questionnaire

is developed based on the results of the first and second stages. The target population of this questionnaire includes different users of SSO e-service system. The number of samples is determined using the Cochran formula. Then, the questionnaire is distributed between users and the data is collected. Next, the validity and reliability of the material is analyzed. The analysis is conducted by Cronbach alpha reliability test and repeatability test in SPSS. The design and structure of the clustering problem is determined. Then, clustering techniques are performed and the results are compared and tested for similarities. The purpose of this comparison is to compare validity and accuracy of the results from clustering customers. Users are classified according to the variables identified in step 2 through K-means and Fuzzy C-means classification procedures

E-SQ survey is designed in two parts as follows.
- Part I: information of respondents including age, monthly income (RS) and education.
- Part II: items related to the quality of electronic services.

The items of the second part are discussed in two parts:
- Part I (ES-QUAL): In this part, respondents express their views regarding electronic services by a number between 1 to 5 (1 for strongly disagree and 5 for strongly agree). This part involves efficiency, system availability, fulfilment and privacy.
- Part II (E-REcS-QUAL): this part is related to feedback of users who have encountered problems using electronic services and had to receive their services by other means. Responsiveness, compensation and contact are used to evaluate the feedback of users.

RESULTS

In this section, results are presented in three parts. First, results of the questionnaire, descriptive variables and verification and validation tests of the results will be presented. Then, the results of k-means and fuzzy c-means will be provided for classification of SSO e-service users.

The studied group includes SSO e-service users. According to current knowledge of the author, it is estimated that 500 thousand people use electronic services. To determine the sample size, Krejcie and Morgan table and Cochran formula can achieve the desired result. If N = 500000, tolerable error = 0.1, and p = 0.35, the calculated sample size will be n = 87. However, 96 questionnaires were completed in this study. The questionnaire developed in the first stage was confirmed by experts using content test. In this case study, the data was collected from 9600 users according to 3 demographic variables and 7 variables relating to the quality of electronic services. Table 1 shows descriptive statistics of the data collected on 3 demographic variables. Customers aged between 20 and 73 years. Their salary is between 600 and 5500 thousand Tomans. Information relating to education varies from Diploma and lower, Advanced Diploma, Bachelor, Master and PhD. Education is marked with numbers between 1 and 5 (1 for illiterate and 5 for doctorate).

Table 2 shows descriptive statistics of the data collected on 7 variables related to quality of electronics services.

The internal consistency or reliability is measured by coefficient of reliability. Reliability ranges from zero to +1. The zero represents unreliability and 1 represents perfect reliability (Chadwick et al., 1984; Kerlinger, 1986). As previously noted, there are 7 variables related to the quality of electronic services, each of which is measured by a number of questions. For reliability, different questions of an item should measure a single concept.

This questionnaire was completed by 9600 users; based on the score of 96 selected questionnaires, internal consistency is determined using Cronbach's Alpha. SPSS software, V15, is used to process data. There are 8 questions for efficiency (Cronbach's Alpha = 0.917; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item. There are 4 questions for system availability (Cronbach's Alpha = 0.917; the values >0.7 indicate efficiency);

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the reliability is strongly confirmed for this item. There are 6 questions in the questionnaire for fulfilment (Cronbach's Alpha = 0.892; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item. There are 3 questions in the questionnaire for privacy (Cronbach's Alpha = 0.788; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item. There are 4 questions in the questionnaire for responsiveness (Cronbach's Alpha = 0.868; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item. There are 2 questions for compensation (Cronbach's Alpha = 0.824; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item. There are 3 questions for contact (Cronbach's Alpha = 0.845; the values >0.7 indicate efficiency); the reliability is strongly confirmed for this item.

The repeatability is that if a measurement material is administered several times to a single group of people in a short space of time, to what extent the results will be close (Chadwick et al., 1984; Kerlinger, 1986). In order to test repeatability, the questionnaires were divided into two equal groups to check repeatability using test-retest (Chadwick et al., 1984; Kerlinger, 1986). In this study, repeatability was tested using the software SPSS V15 and calculating the Intra-class Correlation Coefficient (ICC). This test was performed separately for 8 items of quality of services; the results were as follows. To test repeatability, responses of the first 48 users were analyzed by the second 48 users; the ICC test results are presented in the following table. Obviously, ICC repeatability was 0.073 for single measures and 0.884 for average measures, both of which are significant at 95% confidence level.

Classification of customers

To classify users, the Fuzzy C-means and K-means algorithms are used. The first problem of these methods is the number of classes. To solve this problem, consider two important things: classification error and calculation cost. The higher the number of classes, the lower classification error; on the other hand, calculation cost and computation time increase as the number of classes increases. Thus, the best number of classes comes when there is a balance between the cost of classification error and the cost of calculations. Table 3 shows the different costs of classification per number of different classes in Fuzzy C-means algorithm. Note that the processing cost per unit increase in the number of classes is considered 150,000. Classification error is proportional to the objective function of fuzzy C-means algorithm described earlier. The last column in the table shows the total costs of classification error and processing.

Figure 2 shows the different costs of classification per classes. Obviously, the total costs reached its minimum when the number of classes was considered 4; therefore, the best number of classes is 4 for classification of SSO e-service users. The results of classification are presented below for four different classes

Once the optimal number of classes is determined in the fuzzy C-means and K-means algorithms, the algorithms are encoded to form different classes of users. To run the algorithms, MATLAB software is used.

Table 4 summarizes the preliminary results of classification for 30 sample users by the K-means and fuzzy C-means algorithms. Fuzzy C-means algorithm forms four different fuzzy classes because of its fuzzy modeling type and its output is the degree of membership of a user to different classes. These results are presented in the first four column of Table 4. For example, the degree of membership of the user 1 to the class 1 and 2 is 0.43 and 0.46, respectively, and its degree of membership to other classes is zero. The last column in Table 4 shows the absolute classification of users based on K-means algorithm. In this algorithm, the user 1 belongs to the class 2. However, the same result can be expressed with respect to the result of fuzzy C-means algorithm in which the user 1 has the maximum degree of membership (0.46) to the class 2.

Now, the user classification problem leads to four different classes of users by fuzzy C-means and K-means algorithms; the centers of these classes are given in Table 5. In the Fuzzy C-means algorithm, four classes are formed; for example, the center of class 1 is where the average age of users is 58.1 years, the average income is 11.4 million

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IRR and the average education is 1.9 (diploma or lower). There are 3091 users in this class. In class 2, the average age of users is 40.7 years, average income is 18.4 million IRR and the average education is 3 (BA). There are 2745 users in this class. The center of class 3 is where the average age of users is 26 years, average income is 12.3 million IRR and the average education is 2.9 (BA). There are 2328 users in this class. Finally, the average age of users in class 4 is 53.7 years, the average income is 37.2 million IRR and the average education is 4 (Master and higher). There are 1436 users in this class, which is lower than other classes. A similar classification is done by K-means algorithm in which the centers are very close to the classes formed on fuzzy C-means algorithm.

Although the centers of classes are very similar in the fuzzy C-means and K-means algorithms, there are some minor differences. To ensure that there are no significant differences between the centers of these classes, a pilot project is performed in which the centers of the classes of K-means and fuzzy C-means algorithm are compared. In fact, the null hypothesis of no difference between centers of classes is tested. Therefore, it is assumed that there are two treatments, namely Fuzzy C-means and K-means algorithm, in which the observations are centers of the classes. Because centers of classes point out heterogeneous variables such as age, income and education, the paired t-test is used to compare the two algorithms.

This test called as Paired Samples Test in SPSS was conducted and the results are given below. Clearly, there is a very strong significant correlation between these two algorithms. The correlation value is close to 100%. Moreover, the mean difference is -0.09167 between the centers of classes in two algorithms, which is not significant in 0.05. Therefore, it can be concluded that there is a negligible insignificant difference between these two algorithms. That means, the two algorithms confirm the results of each other; thus, their results are reliable and the rest of analyses can be performed based on these classifications.

Because there is a good agreement between the two algorithms, the obtained mean centers can be calculated as final centers of classes. The results are presented in Table 6.

Table 7 shows the average service quality variables in different classes. Class 1 has the lowest level of satisfaction with efficiency. The average age is the highest in class 1. The lowest income and education levels belong to class 1 (see Table 6). However, this class of users felt poor efficiency using electronic services. This is perhaps due to the improper design of user interface proportional to the ability and knowledge of this class of users. Definitely, improved designs can also improve the quality of services for this group of users.

DISCUSSION AND CONCLUSION

Regarding availability, users of different classes were satisfied with the system availability. Again, the lowest satisfaction belongs to class 1. For fulfilment, the least satisfaction is observed in Class 2; however, class 3 and 4 are not highly satisfied too. Note that there are users with high income and high education in class 2 and 4. The familiarity of these groups of users with electronic services is in higher levels; expectedly, they demand various expectations of electronic services. By the increasing growth of quantity and quality of electronic services, the expectations of users have grown rapidly. Hence, the SSO e-service management needs to focus on the needs of this group of users and define improvement projects by better recognition of these needs.

For privacy, the lowest satisfaction belong to the class 4; in this case, other improvement opportunities can be identified. Members of the class 4 have the highest income and high education level. This group demands privacy and they are not currently satisfied with the status quo. Naturally, this group is more sensitive to its privacy; thus, it is essential to improve privacy. The same is true for responsiveness, compensation and contact.

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As shown in Table 7, different classes of users are variously satisfied with different aspects of quality. For example, the class 4 is well satisfied with availability but not with privacy and compensation. The same condition can be found for other classes of users. Class 2 is well satisfied with responsiveness, but not with fulfilment. Generally, each of the seven variables measure one aspect of service quality; therefore, it is natural to have unequal satisfaction of users. The problem is to find a way to calculate a point or a degree of overall satisfaction for each single user. In the future work, the main component analysis will be used to solve this problem.

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Table 1: Descriptive statistics of the data collected on 3 demographic variables

Descriptive statistics	Age	Salary	Education
Minimum	20	600	1
Mean	42.6	1758	3.1
Standard deviation	13	1084	1.1
Maximum	73	5500	5

Table 2: Descriptive statistics of the data collected on 7 variables related to quality of electronics services

Descriptive statistics	Efficiency	System availability	Fulfilment	Privacy	Responsiveness	Compensation	Contact
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Mean	3.39	3.79	2.60	2.95	3.31	3.01	2.89
Standard deviation	1.19	1.00	1.17	0.98	1.12	0.99	1.16
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Table 3: Different costs of classification

Number of classes	Classification error	Processing error	Total cost
2	1334338	300000	1634338
3	699113	450000	1149113
4	442260	600000	1042260
5	334795	750000	1084795
6	274567	900000	1174567
7	222134	1050000	1272134
8	172535	1200000	1372535

Table 4: Results of user classification

User	Degree of membership to classes in fuzzy C-means				K-means class
	Class 1	Class 2	Class 3	Class 4	
User 1	0.43	0.46	0.07	0.04	2.0
User 2	0.40	0.07	0.21	0.32	1.0
User 3	0.02	0.01	0.02	0.95	4.0
User 4	0.46	0.13	0.35	0.06	1.0
User 5	0.44	0.22	0.27	0.07	1.0
User 6	0.03	0.01	0.94	0.02	3.0
User 7	0.62	0.07	0.22	0.10	1.0
User 8	0.14	0.08	0.14	0.63	4.0

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| User | Degree of membership to classes in fuzzy C-means | | | | K-means class |
	Class 1	Class 2	Class 3	Class 4	
User 9	0.08	0.04	0.08	0.80	4.0
User 10	0.02	0.01	0.01	0.96	4.0
User 11	0.94	0.02	0.02	0.02	1.0
User 12	0.01	0.00	0.01	0.97	4.0
User 13	0.11	0.82	0.04	0.03	2.0
User 14	0.14	0.78	0.04	0.04	2.0
User 15	0.18	0.77	0.03	0.02	2.0
User 16	0.02	0.97	0.01	0.00	2.0
User 17	0.36	0.12	0.10	0.42	4.0
User 18	0.00	0.00	0.99	0.00	3.0
User 19	0.26	0.06	0.11	0.57	4.0
User 20	0.29	0.22	0.12	0.38	4.0
User 21	0.18	0.05	0.31	0.45	4.0
User 22	0.26	0.68	0.04	0.03	2.0
User 23	0.25	0.08	0.62	0.06	3.0
User 24	0.59	0.32	0.05	0.04	1.0
User 25	0.06	0.90	0.02	0.02	2.0
User 26	0.22	0.69	0.04	0.04	2.0
User 27	0.06	0.91	0.02	0.01	2.0
User 28	0.12	0.04	0.17	0.66	4.0
User 29	0.15	0.08	0.20	0.57	4.0
User 30	0.10	0.04	0.11	0.74	4.0

Table 5: Center of classes

| Class | Fuzzy C-means | | | K-Means | | | Users |
	Age	Income	Education	Age	Income	Education	
Class 1	58.1	11.4	1.9	58.0	12.2	1.9	3091
Class 2	40.7	18.4	3.0	40.1	18.9	3.0	2745
Class 3	26.0	12.3	2.9	26.0	12.0	2.9	2328
Class 4	53.7	37.2	4.0	53.2	38.5	4.0	1436

Table 6: The average demographic variables in different classes

	Average age	Average income	Average education
Class 1	58.05	11.8	1.9
Class 2	40.4	18.65	3
Class 3	26	12.15	2.9
Class 4	53.45	37.85	4

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Table 7: Average service quality variables in different classes

	Efficiency	Availability	Fulfilment	Privacy	Responsiveness	Compensation	Contact
Class 1	2.7	3.4	2.2	2.9	2.8	3.1	2.7
Class 2	3.3	3.7	1.8	3.3	3.6	3.7	3.5
Class 3	3.5	3.4	2.1	3.9	4.1	4.3	4.2
Class 4	2.8	4.1	2.1	2.6	2.5	2.3	2.5
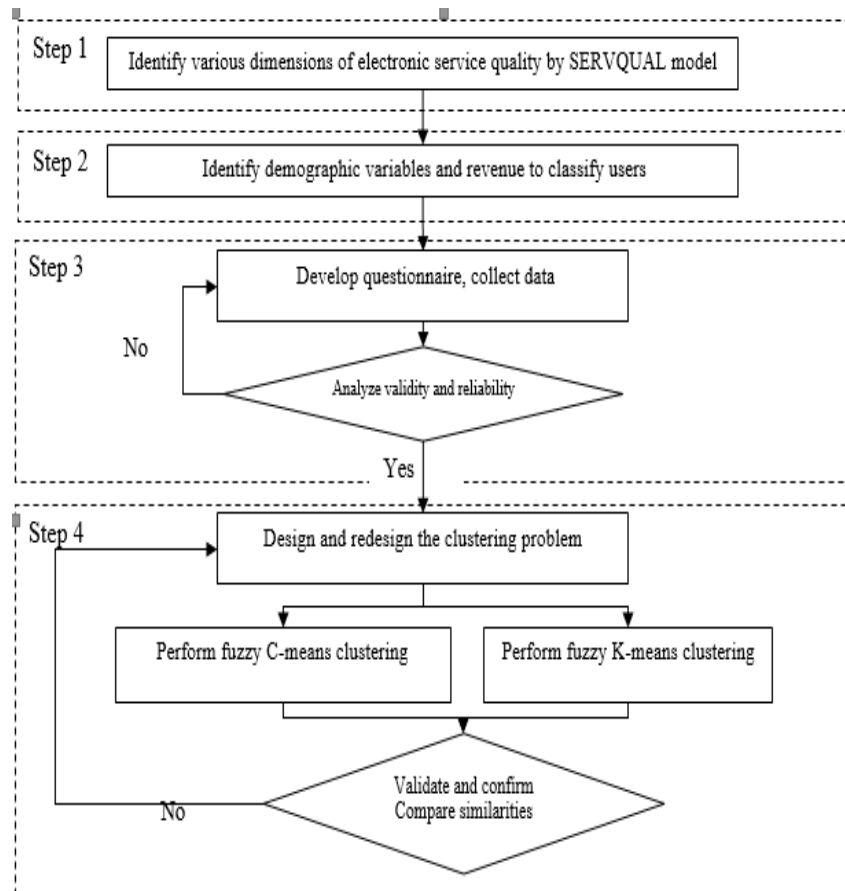
Figure 1: Integrated algorithm proposed to evaluate the electronic service quality

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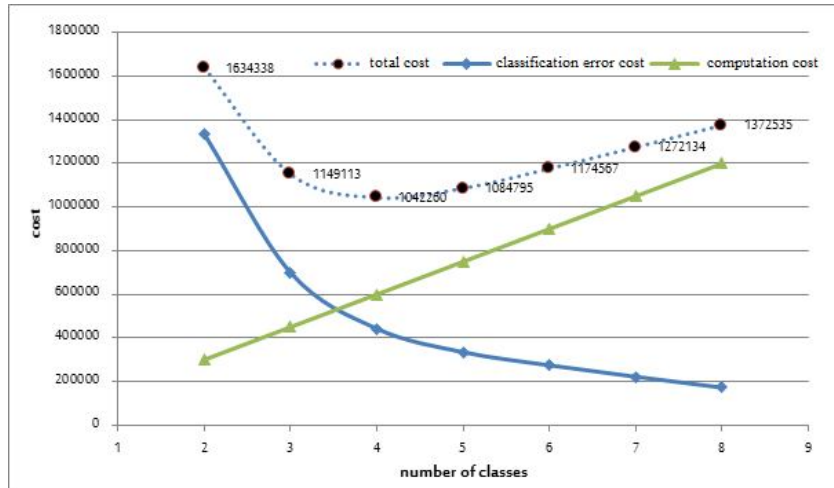
Figure 2: Different costs of classification per number of different classes

RESEARCH ARTICLE

Effect of Theranekron on the Cows with Retained Fetal Membranes

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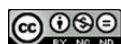
ABSTRACT

Retained fetal membranes (RFM) in cattle are one of the most frequent problems in the dairy industry of many countries including Iran. Due to research about the effect of Theranekron(manufactured by the Richter Pharma Company- Austria) treatment on thetime of placental release in RFM cows, a total number of 100 RFM cows in the dairy herds of Tabriz with similar nutrition and management systems were assigned to two groups from January 2013 to January 2014. In the group A (Control group, n=50) cows received the classic treatment of RFM cows (including of penicillin + streptomycin, calcium borogluconate and vitamin AD_3E. In the group B (Treatment group, n=50) cows received classic treatment plus Theranekron injection 10 ml subcutaneously on the days 2nd and 5thpostpartum. The mean times for placental release were8.4±2.38 and 7.14±1.9 days for groups A and B respectively.The difference between two groups was statistically significant (P≤0/05).In conclusion, placental expulsion in RFM cows could be accelerated by the Theranekron treatment.

Key words: Cow, Dairy, Theranekron, RFM, Calcium

INTRODUCTION

One of the most important post-partum diseases in dairy cattle is retention of fetal membranes (RFM) (Stephen, 2008). Retained fetal membranes (RFM) in cows are defined as the failure to expel the fetal membranes by 12–24 h after calving (McNaughton and Murray, 2009).

It is more likely to occur following abortion, prolonged gestation, twinning, dystocia and cesarean section. It is a severe multiple disorder that impacts the dairy cow industry. The frequent occurrence of metritis and delayed

involutionof uterus after RFM was identified as the main reason for reducedfertility in cows with RFM (Drillich et al., 2006; Beagleyet al., 2010).The incidence in healthy dairy cows is 5%–15%, whereas the incidence in beef cows is lower.(Hashem andAmer, 2009).A failure in the separation of cotyledonary villi from the cryptsof the maternal caruncles results in RFM (Weithril, 1965).The etiologyof this disorder however, is yet to be completely understood.Complex metabolic disturbances during the prepartum periodhave been proposed to be the probable reason of RFM.However, cows with retained fetal membranes are at increased risk of developing metritis, ketosis, mastitis, and even abortion in a subsequent pregnancy. Cows that have once had retained fetal membranes are at increased risk of recurrence at a subsequent parturition.(Michal et al., 2006).A variety of methods havebeen used in the treatment of bovine RFM, although theefficacy of many of these treatments is questionable.Manual removal of the placenta remains a commonpractice despite numerous studies that fail to demonstratea beneficial effect on reproductive performance ormilk yield (Moller et al, 1967; Dyrendahl et al, 1977; Kulasekar et al, 2004). However this method is not harmful after day 8th of parturition (Hamaliand Karimi, 2008). Recent prospective studies comparingmanual removal and intrauterine antibiotic therapyalong with systemic treatment of febrile cows found nodifference in reproductive outcomes when comparedwith the use of systemic therapy of febrile cowsalone (Drillich et al, 2007; Drillich et al, 2006). The implication of these studies is that intrauterinetreatments can result in additional time, cost, and unnecessary antibiotic use without improving reproductiveoutcome.

The purpose of the research was to investigate the effects of Tarantula cubensis extract (Theranekron) on the time of placental expulsion in the cows with retained fetal membranes.

MATERIALS AND METHODS

A total number of 100 RFM Holstein cows (Fig. 1) in the dairy herds of Tabriz (north-west of Iran) with similar nutrition and management systems were assigned randomly into two groups from January 2013 to January 2014.Cows fed by hay, corn silage, straw, soybean and mineral supplement and every cow that failed to expel her placenta by 24h postpartum, included in our experiment. In the first group, A (Control, n=50) cows received the classic treatment of RFM cows (including of penicillin + streptomycin, calcium borogluconate and vitamin AD_3E. In the second group, B (Treatment, n=50) cows received classic treatment plus two SC injections of Tarantula cubensis extract (Theranekron, 1:100 / D2, Richter Pharma, Austria) on the days 2 and 5 postpartum. Then,the time of placental release for every cow recorded as carefully.

RESULTS

The mean times for placental release were calculated as 8.44 and 7.2 days for groups A(Control) and B(Treatment) respectively (Table 1 and Fig.2). The results compared by **Student's t-test**using SPSS software, version 16.0 (SPSS Inc., Chicago, IL, USA). Differences between two groups were statistically significant (P≤ 0.05).

DISCUSSION

In dairy cattle, retained placenta can be considered a puerperal syndrome having a potentially multifactorial etiology and posing a substantial risk factor for postpartum uterine diseases such as metritis and endometritis(Laven and Peters, 1996; Han and Kim, 2005).

The odds of developing retained placenta markedly increase in cows developing negative energy balance and showing an acidotic shift in acid-base balance before calving. During the two weeks prepartum, the elevated plasma non-esterified fatty acids concentration andketonuria of grade ≥ 2+indicative of negative energy balance and the decreasing urinary net acid-base excretion suggestive of the acidotic shift of acidbase balance are metabolic indicators

highly suitable for characterizing the risk of development of retained placenta. Retention of fetal membranes is mediated by impaired migration of neutrophils to the placental interface in the periparturient period. The impaired neutrophil function extends into the postpartum period and probably mediates the recognized complications of retained fetal membranes (**Könyves** et al, 2009). Few effective therapeutic approaches emphasize the importance of preventive treatment for retained placenta in cows. LeBlanc, et al. (2006) have proposed that developing prevention strategies to fight against related diseases (e.g., subclinical mastitis, ketosis, rumen acidosis, and endometritis) would be of more value for a herd, and retained placenta is a prime example of a disease for which prevention strategies might well be a more efficient and possibly more effective long-term health management strategy than common treatment measures.Consequently, a retained placenta is often associated withdelayed uterine involution and subsequent impairedfertility (Sandals et al, 1979; Halpern et al, 1985; Curtis et al,1985; Holt et al, 1985; Olfati and Moghaddam, 2013). Many common therapies have not been shown to beeffective in facilitating the release of the retained placentaand/or improving subsequent reproductive performance; these treatments include manual removal, antibiotic and hormonal therapies(Beagley et al, 2010).Hamali and Karimi(2008) showed that the manual removal of retained placenta in the cows is effective only after 8 days of parturition. Collagenase therapy using umbilicalinjections shows promise as a valuable approach in acceleratingthe expulsion of the retained placenta; however, it isnot considered practical for widespread use because of its cost (Eiler and Hopkins, 1993).Theranekron is an alcoholic extract of the venom of Tarantula cubensis which remains active in pharmaceutical compounds for a considerable time. Many systemic effects such as antiphlogistic, demarcative, necrotizing action were described for Theranekron (Stampa, 1986; Aldabagah et al, 2011) but there are few reports on Theranekron effects about retained fetal membranes in cows.Our results indicated that placental release in the cows with retained fetal membranes could be accelerated by the Theranekron administration on the days 2 and 5 postpartum. The important question is: the placental expulsion how long is shortened by the Theranekron administration? The answer is: 1-2days, in other word, comparison of animals with retained fetal membranes in two groups (Control vs. Treatment) showed that the cows which received Theranekrontreatment, expelled their placentas 24-48 h earlier than the cows did not receive such treatment. Therefore, it is completely depends on the veterinary practitioners decision with regarding to the medical expenses' whichthey decide to use Theranekron for accelerating the retained fetal membranes in the cows or not.

On the other hand, for unknown reason we noticed that the period of placental expulsion in heifers with or without using the Theranekron often 1-2 days longer than of cows.

In conclusion, according to our results treatment of RFM cows with Theranekron could accelerate the placental expulsion in affected cows.

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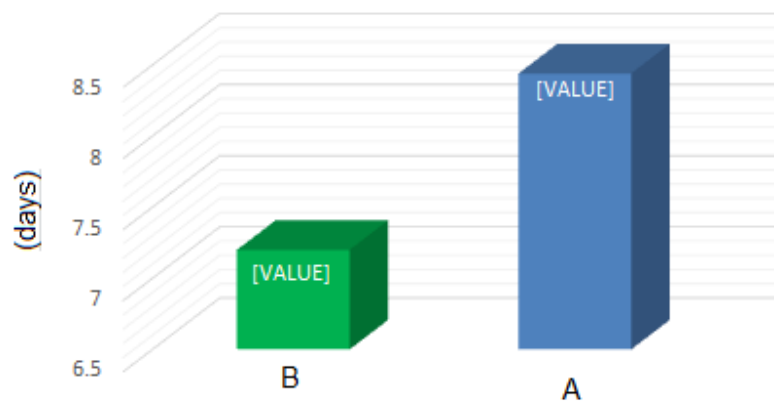**Fig1. Retained fetal membranes (RFM) in a cow**

Fig2.Mean times for placental expulsion in two groups A (Control) and B (Treatment) (days)

Table1. Mean times for placental expulsion in two groups with and without Theranekron treatment

Group	A(Control)	B(Theranekron)	Total
Number of cows	50	50	100
Mean time for placental expulsion	8.44	7.2	

RESEARCH ARTICLE

Economic Valuation of Arasbaran Forests' Non-use Values in Iran

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ABSTRACT

Covering an area of around 148,000 hectares, Arasbaran forests are located in the northernmost parts of East Azerbaijan and Ardabil provinces in Iran. Arasbaran have provided unique treasures of environmental resources in the northwestern Iran due to rare plant and animal species they host as well as intact and broad landscapes within them. The present study aims to estimate non-use value of Arasbaran forests using contingent ranking method. Data was gathered through questionnaires filled by 334 visitors and citizens from ten cities in three provinces: East-Azerbaijan, West Azerbaijan and Ardabil. Based on the valuation method used in this study, the ranked ordered logit regression model was applied. Results showed that option value is the most and the existence value is the least important values of the forests Based on the results, respondents' level of education, income, number of annual visits from the forests and their friendly attitudes towards Arasbaran forests had significant positive impacts on WTP of respondents for the values of the forests. Results of the present study can be served as proper guidelines not only for policymaking and planning purposes, but also to attract public participation in the course of conservation and sustainable use of the valuable resources.

Key words: Arasbaran forest, contingent ranking, ranked ordered logit, I economic valuation, non-use values

INTRODUCTION

The total areas of East Azerbaijan's forests are about 188,000 hectares in which about 164000 hectares of forest belongs to Arasbaran. The area of 148,000 hectares of this forest has been reported as conservational and protected forests. (Approximately 78,560 hectares-about 56% of the area-are specified as protected forests). With respect to Arasbaran's specific climatic conditions, the existence of 1072 species of plants and 97 species of would have been reported in the area; therefore, it is supported as a reserve of "Biosphere" by UNESCO since 1976 and is one of the ten Biosphere reserves in Iran. Arasbaran with its beautiful nature, pleasant landscapes, historical monuments and places of power has a powerful potential to attract tourists. Medicinal plants in the region with significant value, as one of the pillars of regional development can be of particular importance (Department of Natural Resources in East Azerbaijan, 2003).

There are various divisions of the economic value of natural resources such as forests. However, considering the characteristics of Arasbaran forest, the economic values of forests can be divided into two general categories: a) Use values and b) non-use values. A) Use values are means of three categories:

1- Direct consumption values consisting of production value (Such as firewood).
2- Indirect consumption values, which are: information functions consisting of "recreation value," "research and educational value," "historical value" and "aesthetic value."
3- Non-consumption values consisting of "refugium function" (Protection of animal species) and "regulation function" (Regulation of gas, conservation of water and soil).

b) The non-use values are divided into three categories:
1) Existence value (The value that a person gives to an environmental resource's existence, even without using it),
2) Bequest value (The value of the forest resources for future generations) and
3) Option value (the value which a person gives to an environmental resource for future possible usage of it) (Heal et al 2005, Watson 2007, Pascual et al, 2010, Pak et al, 2010).

Due to extensive use of wood for coal production in the past, the present situation of the forests is delicate and fragile, and they are in the danger of demolition (Department of Natural Resources in East Azerbaijan, 2003). According to estimates presented by the World Bank, the net present value cost of damages caused by deforestation and degradation of forests in the Caspian Sea in Iran, which is the loss of benefits and functions of the forest in 2002, is about 760 $ and 147 million dollars respectively, which is 0.8 percent of Iran's GDP in this year (World Bank, 2005). Arasbaran forests are one of the natural treasures, which are located in Iran's North West region and like any other natural sources consist of non-use values. The overall purpose of this study is to estimate the non-use value of Arasbaran forests which could reveal the importance of these forests for society even in the case of not using them.

Due to the importance of economic valuation of environment, including the forests, many researchers have addressed this issue. In some studies, Contingent Valuation Methods have been applied to estimate the economic value of forests and other environmental services (Sattout et al. 2007, Khodaverdizadeh et al. 2008, Barala, et al. 2008, Mollaee, 2009, Pattison, 2009, Jahanshahi and Mousavi, 2011, Tao et al., 2012).

 Some other researchers have used the choice experiment for environmental valuations. (Meyerhoff et al. 2009, Taylor and Tongo 2010, Wallmo and Lew 2011, Cerda et al. 2013, Salehnia 2011). In other studies, contingent ranking approach is applied for economic valuation of environment (such as: Garrod and Willis 1997, Kumar and Kant 2007). In some studies, to assess the recreational value of the environmental services, the travel cost method is used (such as: Hayati et al. 2011, Chae et al. 2012). While some studies have used two valuation methods and tried to compare their results in valuation of environment (like: Sayyadi et al. 2005, Bateman et al. 2006, Mogas et al. 2009).

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Results from literature review indicate that despite the various effects of variables in the studies, briefly, factors such as demographic, economic and social variables associated with each studied resource's characteristics, besides respondent's environmental attitudes could influence respondent's willing to pay (WTP) for different features of environmentalresource.

The emphasis of this study is estimation of non-use value (the option, existence and bequest value using the Contingent Ranking (CR) method, which seems to be compatible with the general behavior of a consumer which is based on ranking of preferences and choosing between them. Therefore, The rank-ordered logit model, which is also suitable for CR method and is introduced by Beggs et al(1981) is applied in this study

MATERIAL AND METHODS

non-use functions of Arasbaran forests

If there was a direct market for environmental goods and services, using the normal pricing methods to value environmental services, would be possible. However, the lack of a suitable market for many environmental functions including non-use services, makes usage of these methods almost impossible.

In the present study, the contingent ranking method is applied to measure non-use values of forests. In this approach, the respondent is asked to rank his choices according to his preferences from the most important to the least important alternatives. For this reason, ranking data, could offer more information comparing with the choice experiment (in which respondent is asked to choose between deferent alternatives). However, this method is more complicated compared to other methods. Contingent ranking method could result in welfare- adapted estimations, provided that the status quo option is one of the alternatives in the choice series. So that in the case the respondent does not interested in any of improvement alternatives, could choose that one (Liu and Wirtz, 2010).

Implicit price of each attribute is the final rate of substitution between non-monetary and monetary attributes, and it is calculated from the ratio of the non-monetary factors to the monetary one:

$$M\arg inal\,WTP = -\left[\frac{\beta\quad non-monetary}{\beta\quad monetary} \right]$$

(1)

The first and most important step in multiple valuation techniques, including contingent ranking, is designing of choice cards. To this end, the main attributes of the resource and the level of each attribute are identified; then the cards and henceforth the questionnaires are designed according to the characteristics of the test. In practice, attributes are selected from reviewing of previous studies or interviewing with the experts group (target group). It should be noted that the prices paid for the studied resources are one of the reviewed attributes and through the monetary factor, it is possible to estimate the willingness to pay for each attributes of the forest. Furthermore, the levels of each attribute are identified through the exploratory studies, literature reviews and interviews with the target groups. The statistical design theory is used for level composition and formation of appropriate scenarios to present to the respondents. Complete factorial design is one of the available options at this stage.

However, because of a large number of compounds in this technique, alternative methods such as "Partial factorial design" is used in which the number of possible combinations are greatly reduced. Table 1. shows the selected attributes in valuation of Arasbaran forests' non-use services. As it can be seen, the non-use values of Arasbaran forests are divided into three attributes with two levels. In this regard, the six alternatives and three choice set was determined that were gathered in one trio-blocks. The SAS 9.2 software was used for designing the cards. Each choice

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set, includes the existence and non-existence conditions besides one status quo option. Also is observed that the existing, option e and bequest value have two levels (important or not important), while the bid price has three levels.

Figure 1, shows a sample of the selected cards to calculate non-use values of Arasbaran forests.

Ranked ordered Logit model (exploded logit regression)

The exploded logit regression conducted in many marketing researches. This model, in fact, is the expanded conditional logit model of McFadden (1987) which is presented by beggs et al (1981) in the economic literatures. The model was developed by Hausman and Rudd (1987) and presented entitled Ranked ordered logit model. The Basic techniques of this model are based on random utility model (RUM) (kummar and count, 2007).

It is supposed that respondent i derive utility U_{ij} for each forest value j, which includes a systematic component μ_{ij} and a random component ε_{ij} :

$$U_{ij} = \mu_{ij} + \varepsilon_{ij} \qquad (2)$$

The respondent i would rank the forest attribute j upper than forest value k, providing that $U_{ij} > U_{iik}$. The error terms ε_{ij} is supposed to be independent and identically distributed, and assuming that:

$$\Pr ob(\varepsilon_{ij} < t) = \exp\{-\exp(-t)\} \qquad (3)$$

Therefore the odds of ranking j higher that k could be explained through:

$$\exp\{U_{ij} - U_{ik}\} \qquad (4)$$

The utility's systematic component U_{ij} can be specified through a linear function of a set of explanatory variables X_i s as below:

$$U_{ij} = \beta_j X_i \qquad (5)$$

In which the X_i vector contains some variables which describe respondents' characteristics yet they do not differ among various attributes of the forest. Also β represent coefficients' row vector which should be estimated. The coefficients for those variables would differ among forest values, moreover one of the β_j vectors needs to be set equal to 0 for the identification achievement (the selection of the reference forest value is arbitrary). The model is equipollent to the common multinomial logit regression model. although, the name "exploded logit" name is applied to indicate an observed rank ordering of J forest attributes and could be regarded as an "explosion" into J-1 independent observations, in a way that if $U_{i1} \succ U_{i2} \succ ... \succ U_{ij}$, it can be expanded as: $U_{i1} \succ U_{ij}$, j = 2,...,J و

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$U_{i2} \succ U_{ij}$, $j = 3,...,J$ و ... و $U_{ij-1} \succ U_{ij}$ (Salomon, 2003). Therefore, the data are considered to be a sequence of choices, in which the forest attribute or value with the highest preference is chosen over all other forest attributes, while the value with the second highest preference is picked out over all but the first one, and this can be continued like above. This explosion is possible through the independence assumption from irrelevant alternatives (IIA) which is also known as Luce's choice axiom, which indicates that the relative preference for any two forest attribute is indifferent to the choice set's other features (kummar and count, 2007).

The random utility model connotes the following likelihood L_i for a single respondent as below:

$$L_i = \prod_{j=1}^{j} \left[\frac{\exp\{\mu_{ij}\}}{\sum_{k=1}^{j} \sigma_{ijk} \exp\{\mu_{ik}\}} \right]$$

(6)

in which the $\sigma_{ijk}=1$, if $Y_{ik}>Y_{iJ}$, and $\sigma_{ijk}=0$, otherwise.

The statistical population of this study, is approximately 334 people, which are chosen randomly between visitors of the Arasbaran forests and also citizens of ten neighborhood cities (all were within a radius of 250 km from the forests), from three abutting provinces: West Azerbaijan, East Azerbaijan and Ardabil. It should be noted that the sample size is calculated using the formula introduced by Orme (1998).

RESULTS AND DISCUSSIONS

Statistical characteristics of respondents are presented in Tables 2. The mean of age variable represents a middle-aged population of respondents. The majority of study subjects were married men and individuals with small families. The mean of annual gross income indicates a normal income for the majority of respondents, which have less than one visit per year from the forests. The ars variable indicates individuals' friendly attitude toward Arasbaran forests. (Index of friendly attitude towards Arasbaran). The index was consisted of 10 speeches to measure respondents' friendly attitudes towards the forests, such as ignoring some utilities for safeguarding them. Each speech is evaluated through codes from 5 (very important) to 1 (not important). Mean of this variable indicates relative importance of Arasbaran forest from respondents' point of view. Furthermore, the variable edu represent the education level of respondents, which is an ordinal variable identified as: 1=Illiterate, 2= Primary School, 3= Junior high school, 4= Senior high school, 5= Associated Diploma (AD), 6= BSc, 7=Msc and 8=PhD. Mean of this variable states that most respondents have academic education levels.

Table 3, shows the result of estimation of ranked ordered logit regression to non-use values of Arasbaran forests. The variable exist, opt and beqst show the importance of existence value, option value and bequest value for the respondents, respectively. Furthermore, the variable **P**, shows the bid price.

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To infer the effects of individual variables that influence people's willingness to pay, the ranked ordered logit model with interactions of the bid price (p) with these factors was also estimated, which the results of estimation of both models are presented in the table 5.

According to the result, importance of each attributes has a positive effect on respondents' WTP, as expected. Moreover, based on the interaction model results, respondents' level of education, their income, their number of annual visits from the forests and their friendly attitudes towards Arasbaran forests have positive effect on WTP of respondents for the forests' non-use values. Using equation (1), the monthly, annual and total WTP for each value is calculated and the results are presented in the table 6.

As it is presented in the table, the option and the existence values are the most and the least important values, respectively. The same ranking results were obtained through the direct ranking question of the attributes which was asked from the respondents in the questionnaire. According to the conditions of the region which is unsuitable for public transportation and comfortable visits, yet, the importance of option vale is expected.

CONCLUSION

Table 4 reveals that public willingness to pay for non-use values of Arasbaran forests is a large amount of money. This issue shows the great importance of environmental valuation especially the non-use values of these Forests.

The study's results showed that is considerable amount of money. This issue could be helpful in the policy making for the improvement of forests condition, since the people's aid, considering the present situation of Iranian economic, could provide a major amount of money for preserving the environmental resources including Arasbaran forests.

The positive relation between income and WTP indicates that improvement of income in forested areas could help to better the habitant conditions. In this respect suitable policies and employment programs along with policy makings which support the environmental protection programs are suggested.

Furthermore, since based on the results the number of annual visiting of forests positively could increase the WTP for forests values, making opportunity for people, preparing tours and encouraging people to visit the forests, not only could increase the tourism income of region, but it also can help to preserve the forest and gather public aids to conserve them.

Finally since the study shows a significant link between respondents' positive tendencies towards Arasbaran forests, assisting NGO's formation regarding environment, especially forests, and related subjects, along with encouraging them to do activities to develop society's awareness of environmental resources and their values, besides disadvantages of deforestation and other environmental damages, is another suggestion; since the philosophy and nature of such organizations is to raise these kinds of information in the society or do activities like that. Besides them, governmental activities, like special TV programs, or advertisement billboards in appropriate places to augment society's knowledge towards natural treasures like forests is suggested.

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Table 1. The studied Attributes and their levels of Arasbaran forests

Non-use value of Arasbaran forests			
10000	Bequest value	option value	Existence value	Value
20000	important	important	important	levels
30000	Not-important	Not-important	Not-important	

Table 2. Variable definition and sample statistics

Variable	definition	Mean	SD	Min	Max
Respondent's Income (Rials)	inc	5343000	740.761	250	6000
Age of respondent	age	40.396	7.70	23	71
Gender(1=male, 0 otherwise)	gndr	0.73	0.445	0	1
Level of education	edu	5.86	1.01	4	8
Family size	fmlsz	3.46	1.3	1	7
Number of annual visits	vst	0.63	0.73	0	3
Index of respondents perspectiveon forests	arsb	3.71	0.68	2	5
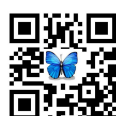
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Table3: Estimation result of rank-ordered Logit model non-use values of Arasbaran forests

Rank-ordered logit regression with interactions		Rank-ordered logit regression		Variable
Standard eror	coefficient	Standard eror	coefficient	
0.0000878	***-0.0013	0.0000273	**-0.000193	P
0.062	**0.143	0.060	***0.117	exist
0.065	***0.623	0.064	***0.606	opt
0.045	***0.218	0.046	***0.119	beqst
0.000011	***0.0000321	-	-	pedu
0.000000013	***0.000000037	-	-	pinc
0.000021	***0.00016	-	-	pars
0.000017	***0.000076	-	-	pbaz
LR chi2= 801.77*** , Pseudo-R²=0.39		LR chi2= 391.02*** , Pseudo-R²=.36		

***: $P<0.01$, **: $P<0.05$, *: $P<0.1$

Table4: Results of WTP extractingand ranking of non-use values

İmportence of bequest value	İmportence of option value	İmportence of existant value	values
1914.79	5477.40	1262.55	Ind. monthly WTP(Rials)
22977.48	65728.89	15150.6	Ind. annual WTP(Rials)
185.05	529.35	122.01	Total WTP(million Rials)
2	1	3	Ranking of values

Alternative C	Alternative B	Alternative A	attributes/ levels	
None of these things are important to me and I am not willing to pay any price for it.	Importance	Importance	**Existent value** The valuefor the existence ofthe forest, notto use it	Question 1
	Importance	Importance	**option value** The value of forests for future uses	
	Unimportant	Importance	**bequest value** The value of forests for use of future generations	
	10000	50000	**WTP(Rials)**	
○	○	○	Please selectfrom 1 to3 above,you will prefer **(1 is the best)**	

Figure 1: Examples of chosen cards for the calculation of non-use values

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Investigation Strategies and Contexts of Protective Agriculture Development in Qazvin Province

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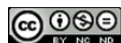
ABSTRACT

The present study was conducted to evaluate the development of conservative agriculture practices in Qazvin province. The present study was a non-experimental, descriptive and causal relationship method. In this research, data was collected by questionnaire which was filled by farmers in the County Agricultural Service Center, randomly. The questionnaire was composed of five main parts which were: individual and production characteristics (13 items), social characteristics (10 items), and awareness of protective agriculture (5 items), characteristic of agricultural operations (22 items) and extension (14 items). The number of samples was 384 farmers whom were selected based on the total number of beneficiaries of the agricultural sector in the Qazvin province. Data was analyzed by using computer software SPSS ver.21 and descriptive statistics, Pearson correlation, Spearman correlation, Mann-Whitney and Kruskal- Wallis test. Of 25.49% farmers used protective agriculture in abundance. Of 74.51% of farmers used protective agriculture moderate to low. Correlation between knowledge and application of protective agriculture and social characteristics were direct and significant (P <0.05). Correlation of application of protective agriculture and age of the farmers was significance and indirect, but had direct significance correlation with the use of bank credit (P<0.05). There was no significance correlation between application of protective agriculture and farmers' degrees. The results of this study showed that awareness of Qazvin farmers in related of protective agriculture were low. As a result, implementation of protective agriculture, low tillage and no tillage farming operations were performed at a lower level.

Key words: Protective Agriculture, Knowledge, Performance, Low Tillage, Qazvin

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INTRODUCTION

Soil erosion is considered as a serious threat to human well-being and even to survival of human. In areas that soil erosion is not controlled, soil depth decreases and loses its fertility gradually. Soil erosion, is not only the cause of poor soil and abandoned farms and in this way, leaves irreparable damages, but it is the cause of the sedimentation in waterways, dams, ports and reduces their intake capacity, bring about great losses. Soil erosion and replacement of non-arable lands with Lands with soil fertility has caused migration of thousands of villagers to the cities. Therefore, there is no doubt that progress and sustainable agriculture requires the application of appropriate and effective methods to prevent or reduce the amount of washing and wasting soil.

Due to the limitations of water and land resources, high evaporation, fewer rainfalls ; almost one third less than the global average, low soil organic materials in Iran, the number of tillage and planting operations of the production process, especially given the limitations of consumption energy, especially in dry lands vulnerable to the erosion of agricultural land, especially dry land and breadth of the land, the need for sustainable production and food security in the long term, the most important things that a fundamental way to solve them is going through conservation agriculture (Tang et al., 2005).

Conservation agriculture means planting crops with minimum soil movement and keeping the residue of the previous crop plants and based on three foundations, including non-turned soil, or least possible soli movement; keep the residue of plant and crop rotations. It is the combination of farming practices that protect soil and water resources during the growth of the crop. One advantage of this system is to reduce seed bank of weeds in the soil and lessen the spatial and temporal pollution of weeds. Predators and micro-organisms are caused by remaining of the remnants and ecosystem changes, their presence and activities is more than traditional culture;destroy many the weed seeds in the soil.

The most important goals of conservation agriculture in the view point of Hobbs et al., 2008 include:
- Preventing surface evaporation and maintaining soil moisture storage.
- Conserving soil from wind and water erosion.
- Increasing the water productivity (the water-based agricultural production).
- Increasing the fertility and organic materials of soil.
- Improving soil conditions for growth of root.
- Reducing energy consumption in tillage and planting operations (reducing the consumption of fossil fuels).
- Reducing production costs and increase net profits.

The main purpose of this study is to identify factors effecting the development of conservation agriculture in Qazvin province, which includes sub-goals such as recognition of the descriptive characteristics of farmers in Qazvin, setting indices of agricultural protection and scrutiny of its application in Qazvin province and finally analysis the influential factors.

Due to problems of conventional tillage including soil clods of soil, high energy consumption, time consuming, being costly, destruction of soil structure, creating ripples in the field, increase water intake, wind and water erosion of soil, reduction of soil organic materials, creating a hard layer and etc. have caused that the utilization of conservation tillage methods that conserve soil moisture, increase soil temperature in the autumn and balance in the summer, increase soil fertility, premature product in the two cultivations, reducing tillage and residue management plant at the soil surface is extended. Any attempt to reduce the intensity of tillage, reduced tillage depth or loose soil without reverting it, it is a conservation tillage. In this system, all or part of the crop residue (minimum 30%) is kept in or near the soil surface,keeping crop residue on the surface or near-surface soil tillage is a technique to maintain soil moisture, prevent leaching of soil particles caused by blows Rain on the slopes and water erosion is reduced, also

reducing the severity of destroying soil tillage system of high fragmentation and displacement of soil particles and prevent and reduce wind erosion. Reduced tillage and no-tillage arecommon methods of conservation agriculture.In the reduced tillage operation is done based on the type of plant and the amount of crop residues to a sufficient depth (15-8 cm) for placement of fertilizer and seed and mixture of the surface layer with the remains. In no-tillage method, notillage operations are done and only put fertilizer and seed planting machines into the soil. In no-till method crop residue is free on the soil surface. Tillage techniques in different parts of the world are localized according to soil conditions and climate of each region and the benefits for which the region are used (Hemat and Mosaddeghi, 2001).

Benyt and Afory (1993) said the promotions of appropriate methods to control weeds and improve simple equipment are the most important factors for farmers to accept conservation agriculture. Acceptance of conservation agriculture insmaller farms was higher than larger farms.

Along and Martin (1995) in their study, examined the relationship between the adoption of sustainable agricultural practices by farmers of Iowa with different variables such as age, education, history, agriculture, farm size, access to sources of information and understanding of the compatibility of the innovation. They concluded that the adoption of sustainable agriculture practices with farmers' access to sources of information and understanding of compatibility innovation is a significant positive relationship.

Giridhary and Gopal (2003) studied social, organizational and ecological factors affecting the acceptance of protection operations of the land in the fields Nepal were exposed to erosion. They examined variables such as agricultural extension services, the relationship between farmers, family members have agricultural jobs, education of land management, education of parents and participation in conservation land management practices. Their research showed that factors such as awareness of soil conservation practices, access to information systems, utility operations, soil conservation and land operators tend to adopt soil conservation practices at the farm level was the most important factors in conservation agriculture.

Dumansky et al (2006) in a review examined conservation agriculture and the factors affecting it in South Africa, America, Canada, Australia, and several countries in Asia, Africa and other European countries. In this study, the link between conservation agriculture and no-till farming was studied. The research showed that factors affecting conservation agriculture without tillage involves maintaining a permanent soil cover, promoting, soil microorganisms, promote careful use of chemical fertilizers, pesticides, and other inputs planting, use of compost and organic soil amendment and improvement forest soils in order to increase farm income and soil biodiversity. The results showed that conservation agriculture without tillage is implemented in more than 95 million hectares of agricultural land in the world. The results showed that 47% conservation agriculture without tillage operations are done in southern Africa, 39% in Canada and the United States of America and 9.3% in Australia.

Mac Robert and Rickards (2010) examined the changing conventional farming systems in conservation agriculture without tillage in Mali, Victoria. In the study,social factors were examined; farmers`concern about using conservation agriculture with no tillage farming operations was its profits in comparison withagricultural operations. Promotional methods in conservation agriculture are essential.

METHODOLOGY

This study is an applicable research and its method is non-experimental, descriptive, correlation and scientific which was conductedin survey method. In this study, personal and production characteristics (13 items), social characteristics (10 items), information regarding conservation agriculture (5 items), features of agricultural practices (22 items) and the promotional methods (14 items) were evaluated.

The dependent variable of the development of conservation agriculture is Qazvin (5 items).Cronbach's alpha coefficient was used to calculate the reliability of the method.

Statistical methods

1. **Descriptive statistics:**
Pearsoncorrelation coefficient
Spearman correlation coefficient

2. **Inferential statistics:**
Kruskal Wallis
Mann-Whitney test
Multiple Regression

Regression analysis of the impact of independent variables on the dependent variables of conservation agriculture in Qazvin.

Awareness variables predict conservation agriculture, membership of the cooperation, the land, and type of activity, participation and satisfaction of income, application of conservation farming.

RESULTS AND DISCUSSION

In this study, 384 questionnaires were completed by farmers in the province of Qazvin. 27.09 percent of questionnaires were completed in the city of Qazvin, 9.8 percent in the city of Alborz, 28.6 percent in the city of Takestan, and 8.1 percent in Abyekand 26.6 percent in the city of Bouin Zahra.

The average age was 45.15 years and the standard deviation was 6.9. The minimum and maximum age of the patients, respectively was 70 and 22 years old. People with age group of 49-40 years old have the highest rate (32 percent).

The average agricultural work experience of people was 22.14 years, SD was 7.8 years. The minimum and maximum of the job records, respectively is 4 and 50 years. That person with 10-19 years of work experience in agriculture has the highest incidence (40.4 percent). The least frequent (4.3%) for those whose work experience was less than 10 years. 93.7 percent of farmers surveyed were married and 6.3% were single (4-4). 85.9 percent of farmers were educated, 41.7 percent of them finished the third year of guidance school with the highest frequency. 7.3% of those with a university degree. 14.1 percent of those surveyed were illiterate. 44.3 percent of farmers were engaged in agricultural work. 9.6% of farmers were also gardeners. 44% also worked together in horticulture and agriculture. 38.8 percent of farmers surveyed have less than 10 acres of land that has the highest frequency. Farmers with 19-10 and 29-20 acres with respectively 14.6 and 28.1 percent are the second and third frequency. 12.5 percent of farmers have more than 39 hectares of land.The main product of farmers with 76.8% is grain (wheat, barley and corn) with the highest frequency. Fruit was 14.3 percent. Forage crops 3.1 percent and 2.1 percent for industrial crops (oilseed rape, sugar beet), respectively.

67.2 percent of farmers had agricultural land that has the highest frequency. 15.1 percent of farmers have leased land for cultivation. 15.6 percent of farmers owned land and rented the property. 2.1% of agricultural land was communal. 50.5% of farmers were satisfied with their income to some extent that has the highest frequency. 25.5% of people were satisfied with their income. 8.6% of farmers were also very satisfied with their income. 63.9 percent of farmers had no income except agricultural income and 36.1 percent of farmers had their income from other jobs in addition to

agriculture. 52.1 percent of farmers are members of various rural cooperatives and 47.9 percent were not a member of any cooperation.

In examining the situation of each farmer in his village, 43.2% of farmers who were active in the country that has the highest frequency. 28.4% of them were in the village, like a normal person. 11.5% of them had high status in his village. 35.4%of farmers plow their land 2-1 times. 42.4 percent of them plow the land 4-3 times. 6-5 times plowing was seen in 18.5% of the farmers. 3.6% of farmers plow their land more than 6 times. 24.4% of farmers enter devices 2-1 times a year into their farm. 56.6% of farmers enter devices 4-3 times per year into their own land. 5 or 6 times entry was seen in 13.5% of the farmers. 8.9% of farmers enter their devices into arable land more than 6 times a year. 8% of farmers plow their land deeper than 20 cm. 57.1 percent of farmers plow their land 30-20 cm deep. 40-30 cm depth in the plow of the land was seen in 31.2 percent of farmers. 3.8% of farmers plow their land 50-40 cm depth . 7.3 percent of planting methods was manual and semi-mechanized and fully mechanized farming, respectively was 59.6 and 33.1.

4.5 percent of farmers use natural methods to control pests and plant diseases. 17% of farmers use manual methods to control pests and plant diseases. Semi-automated and fully automated control pests and plant diseases was 65.4 and 13 percent, respectively. 2.6 percent of farmers use natural ways to control weeds in their fields. 18.5% of farmers use handy method to control weeds. Semi-automated and fully automated control weeds were62.5 and 16.4 respectively. 7.9% of the harvest methods used by farmers were manually and semi-automated and fully automated were 39.6 and 52.5 respectively. 14.1percent of farmers in Qazvin with tillage compound (combinat), 64.8 of farmers have a chisel plow, 35.7 of farmers have a crushing stalk, 34.1 percent of farmers have slot opener, 9.6 percent have a row cleaner, 9.6% of farmers have direct planting seed, 16.9 per cent with a cultivator and 18% percent with chisel ploughs respectively.

Type of irrigation of 49.2 of percent farmers was waterlogging, 24.2 percent was Faroese, 6.7 percent was passageway irrigation, and 13.8% of the leak pressurized irrigation, 24.7 percent was drop irrigation and 7.5 percent wassprinkler irrigation.

The study finds that the average of the dependent variable (the application of conservation farming Qazvin province) is equal to 2.83.And mean of the variable is 3 and its view isestimated 3.29 with standard deviation of 0.782.The minimum and maximum use of conservation agriculture is equal to 1 and 4.75 and the amount is low.

The adjusted coefficient of determination is equal to 0.53 it means the variables that have been entered into the regression model explained 53% of variance using conservation agriculture (R2ad = 0.531). In other words, 53.1 percentage of changes in the dependent variable is explained (the application of conservation agriculture) by the six variables.Regression coefficients table shows the values of the variables of conservation agriculture awareness, membership in cooperation, the land, type of activity and participation with possibility of 0.01 and variable of income with possibility of 0.05 are significant.Besides standard and non-standard variable coefficients awareness of conservation agriculture is respectively 0.405 and 0.420 with standard and non-standard variable rate multipliers respectively -0.321 -0.206 membership cooperatives and coefficients of standard and non-standard variable rate -0.200 and -0.005 and land respectively. The standard and non-standard variable coefficients of 0.178 and 0.216 respectively type of standard and non-standard and variable coefficients of 0.176 and 0.160 respectively participation and consent of the income variable coefficients, standard and non-standard, respectively are equal to-0.097 -0.066.

According to standardized coefficients, the variable of awareness of conservation agriculture has more predictive power andif one unit is added to the variable of awareness of conservation agriculture, the application of conservation agriculture increases 42 percent. And if the unit of membershipin cooperationis reduced,21 percent of applying conservation agriculture is reduced.If one unit of the land is decreased, 20% of the application of

conservation agriculture is lessened and if a type of agricultural activity is increased, rate of 18% will be added to the application of conservation agriculture. If one unit is added to the participation rate, 18% will be added to the application of conservation agriculture.If a unit of satisfaction is reduced,　　-0.066 percent revenue decline to use conservation agriculture is decreased. The relationship between independent variables and the dependent variable multiple linear regression (using conservation agriculture), the model was obtained.

$$Y = 1.43 + 0.405X_1 - 0.321X_2 - 0.005X_3 + 0.178X_4 + 0.176X_5 - 0.07X_6$$

In which

Y, conservation agriculture
X1, awareness of conservation agriculture
X2, membership in the cooperation
X3, the Land
X4, type of activity
X5, participation
X6, satisfaction regarding income

CONCLUSION

More than 80 percent of farmers surveyed in this study were smallholder and less than 30 hectares. Small pieces of farm land in the province are one of the obstacles to the implementation of conservation agriculture. Because the implementation of conservation agriculture, integrated land will be the first step. 33 percent of the planting operation has less than 17 percent of operation and nearly 52 percent of the operation of harvest are mechanized and semi-mechanized and the rest of them are done manually which includes a multiplicity of instruments and low mechanization in the province. Several entrances of tractors into the fields (more than 4 times during the growing season) are as well other problem.

In the province of Qazvin agricultural protection was very low. Machines combinat, row cleaners, seed direct planting, field cultivator and chisel ploughs existed only in less than 20 percent of farms. Some devices, such as direct seeding seed and combinatthe main instruments which were in less than 15 percent of farms. Other devices, such as light and chisel plow chisel ploughs were in less than 40 percent of farms.

In the province of Qazvin pressurized irrigation was very low so that the pressurized irrigation sprinkler was in less than 6 percent of farms. The pressurized irrigation drip and leak was less than 25 and 14 percent, respectively. This causes a sharp increase in water consumption. The most cultivated crop is corn; among other crops cornrequires high amount of water and traditional irrigation of is caused more water shortage.

Another problem in the implementation of conservation agriculture is low levels of fallow lands in a way that more than 50 percent of farmers put a quarter of their land in fallow only, and the rest the of land was planted. This leads to soil erosion and compaction of soil more and more and further deplete soil organic materials. One of the problems is non-return crop residues in arable land. More than 60 percent of crop residue is fed to animals, and or in order to control pests and diseases were burned. The farmers to make maximum use of crop production, crop residues for feeding animals are collected or sold to other people to do it. This causes loss of soil organic material and soil erosion and increase water consumption.

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Low-tillage farming operations less than 15 percent of farmers had adequate information. Or no tillage operations in more than 70 percent of farmers had low or moderate awareness. The importance of preventing soil erosion and conserve irrigation water was less awareness. The results of this study showed that farmers' knowledge in Qazvin Province of conservation agriculture is low and thereby also the implementation of conservation agriculture and low tillage and no-tillage farming operations run at a lower level in throughput.

The implementation of conservation agriculture on agricultural lands is much more than smaller farms. A plurality of protective equipment and agricultural machinery in the province is low and few people knew of their application. As the amount of pressurized irrigation in the province was down and machines move into the fields several times, and on the other side plant debris get out of the fields, the conservation of soil and water is so low which requires the necessary measures and authorities` interference in this case.

Implementation of conservation agriculture was higher in the cities of Takestan and Alborz than Qazvin, Buin Zahra was Abyek.
There was no difference in terms of conservation agriculture between married and single people.
There was no correlation between the degree of farmers and the application of conservation agriculture.
The order of implementation of conservation agriculture in terms of type of activity was farming + gardening more than farming and gardening.
Implementation of conservation agriculture in terms of type of main product was higher in cultivation of summer crops, farming and gardening than forage crops, industrial crops, cereals and fruit.
Implementation of conservation agriculture in terms of land ownership was the same in ownership of the land, leased, rented and shared.
By increasing the satisfaction of income, also the utilization of conservation agriculture increased. The application of conservation agriculture among those with non-agricultural incomes and people with no income other than agriculture were the same.
The application of conservation agriculture in the members of cooperation was more than non-members.

The results showed that most parts of the farming lands in province are consist of smaller pieces of arable land and the main agricultural activity in them was also the cultivation of crops. More than 60 percent of farmers and farmers are less than 49 years old. Nearly 95 percent of farmers have more than 10 years of farming experience and more than 80 percent of them were literate. Farmers' participation in social issues also was relatively high percentage (60-40 percent). However, the relatively low awareness of farmers about conservation agriculture in the province of Qazvin was low by way of the high and very high awareness in this area was nearly 18 per cent of the population which was very low comparatively. Low tillage and no-tillage farming operations had the same way, having a lot of low information about tillage and no-tillage farming operation was 14.3 and 23.1 percent respectively. Farmers had so little information about preventing soil erosion (approximately 30%). All of these issues reflect the importance of conservation agriculture in the province. One of the reasons of the low agricultural especially combinat and seed is the lack of information. The results showed that awareness of conservation agriculture with farmer's age has the inverse correlation (P. Value <0.05), so that young farmers have a greater awareness of conservation agriculture to older farmers. This reason could be partly due to the awareness of younger farmers. As well as the awareness of conservation agriculture have a direct correlation with the amount of land (P. Value <0.05), so that farmers with larger plots of arable land are more aware of conservation agriculture, and vice versa. In The larger landowning many experts and technicians are used, which automatically increases the awareness of conservation agriculture. Significant association between the uses of conservation agriculture with knowledge of conservation agriculture is also another reason. Karimi`s Results (2000) was similar to the present study. He found that the age, agricultural job records and debt have significant negative relationship with adoption of agricultural technology of conservation agriculture. Omani (2000) also found that between the ages of wheat cultivators, records of wheat cultivation and adoption of low input sustainable agriculture, there was a significant negative correlation which was consistent with the results of the present study. Younger farmers are more prepared and have more information in comparison with

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older farmers to do conservation agriculture. Knowledge of soil conservation practices, access to information systems, the benefits of soil conservation practices and land operators tend to adopt soil conservation practices at the farm level is the most important factor in conservation agriculture (Giridhary and Gopal, 2003). Hossein et al (2010) also found that increasing the amount of education raises the adoption of conservation agriculture with no-tillage. Leading farmers do not need to be educated to adopt conservation agriculture without tillage. The possibility of change and acceptance of farmers under the age of 35 is higher than the probability of acceptance of other farmers. This study showed that application of conservation agriculture in Qazvin province was relatively low. Great practical application of no-tillage farmers were observed in 7/11 percent. Heavy use of agricultural implements protection is between 5.12% and 6.28%, respectively. The low percentage of small farmers has low-tillage or no tillage implements. As well as the function of conservation agriculture with farmer's age and was inversely correlated (PValue<0.05), so that farmers use conservation agriculture among younger than older farmers. As well as the application of conservation agriculture with the use of bank credits and direct farmer was a significant correlation (PValue<0.05), as the increase in bank credit, as well as greater use of conservation agriculture.

But the relationship between the farmers` work experience and conservation agriculture and the framing land were not significant and meaningful. Also, in more than 65% of features, agricultural land plows more than 4-3 times. A plurality of entrances of devices to farming land was also higher (more than 4-3 times in more than of 70%). Plows are mostly (over 90%) was more than 30-20 cm. Mahboobi et al (2004) also showed that there is significant correlation between the use of technology, knowledge and methods of soil management and conservation by farmers regarding the farmers and farm characteristics, features of technology and agricultural purposes that are in the same direction with the results of present study. Torshizi and Salami (2007) also showed that awareness of the effects of agriculture and land conservation and education are the most important factors of conservation agriculture operations that is partially in the same line with present results. While Wisdom and Andreas (2010) showed that the first factor in the implementation of conservation agriculture is the price of cultivated crops and after that some other factors such as large or small family, level of education of parents and changing costs in the implementation of conservation agriculture that does not match with the results of effective conservation agriculture. It can be said that the implementation of the conservation agriculture inaddition to characteristics of farmer and type of land, climatic factors, depends on type and price of the product.

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Table: 1

variables	The Cronbach's Alpha
Social participation	$\alpha = .947$
Information regarding conservation agriculture	$\alpha = .925$
Application of conservation agriculture	$\alpha = .924$

Table2: Table of correlation relationships between variables

status	Sig.	Study of the relationship		Scale	independent variable
Rejected	053/0	Pearson coefficients (-0 / 099)	Development of conservation agriculture	relative	Age of Farmer
Accepted	778/0	Pearson coefficients(014/0)		relative	Agricultural history
Rejected	53/0	Spearman coefficient (-0320/0)		Ratings	Education
Accepted	261/0	Pearson coefficients(-058/0)		relative	The amount of agricultural land
Accepted	017/0	Pearson coefficients(095/0)		Ratings	Consent of income
Accepted	001/0	Pearson coefficients(376/0)		Ratings	The participation in the work in the village

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Table: 3

Variable	B (Standard rate)	The standard error of B	Beta (nonstandard rate)	T	P
Awareness of conservation agriculture	405/0	052/0	420/0	783/7	000/0
membership of the cooperation	-321/0	067/0	-206/0	825/4	000/0
the land	-005/0	001/0	-200/0	638/4	000/0
type of activity	178/0	036/0	216/0	991/4	000/0
Participation	176/0	058/0	160/0	043/3	003/0
satisfaction of income	-066/0	030/0	-097/0	-207/2	028/0
Constant number	429/1	232/0	-	169/6	000/0

RESEARCH ARTICLE

An Approach to the Identification and Evaluation of Urban Public Spaces (Qtarchyan Street of Sanandaj) Emphasized on Women Population

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ABSTRACT

The structure of modern cities is the result of processes which began from many years ago and formed based on different powers such as time and economic, political and social force. The structure and texture responds for different historical periods and city is where the needs and will of its inhabitants are expressed. This study seeks to highlight the importance of safety of streets in relation to recognizing the elements and qualities of spatial and perceptual organizations in streets and their role in women's sense of security in society. City spaces as a field for living should be able to prepare a safe, healthy and sustainable environment according to similarities and differences between individuals and social groups, age and sex. And give an appropriate response to the needs of all sections of society and to meet the minimum requirements. Urban areas should provide facilities for all people, so that from the standpoint of physical and sensory characteristics it will be compatible with characteristics of all operators and to be usable for them.

Key words: structure, identification, public spaces, women, Sanandaj

Ayoob Murad Khani *et al*

INTRODUCTION

Development of effective and dynamic urban spaces is of the main issues that concern architects and planners. Today's social life and urban spaces as the ventricle attempted, have different aspects but it seems rare in our country, except some issues of urban planning that has emphasized on theoretical points and less attention has been paid on people, their activities and spaces(Seixas & Albet i Mas, 2010). As all we know, for uunderstanding and clarification of various aspects of impression on the urban context of social relationships and contacts Possible civilian presence in more desirable areas of the city provides the space and dimensions and human body are desirable(Leontidou, 2010).

METHODOLOGY

The present study has an assumption that the spatial and perceptive organization is effective on the sense of security of women. And the role of quality of spatial organization is stronger space resolution is effective. This study is a descriptive survey and it has quantitative and adaptive strategy. Also, we have used documents and questionnaire was used(Carmona, de Magalhães, & Hammond, 2008). Preliminary studies in the field as well as to investigate the location and physical issues that have been studied in Qtarchyan Street of Sanandaj.

Security and spatial and Perceptual Organization in the streets:

Aplyard explains the goals of urban environment part of life, in seven kind that are access to facilities, identity, and public life of the community, the authenticity and meaning, social justice, self-reliance and mentions The street is a tool to achieve any of these goals(Thompson, 2002)For Sitte, the most fundamental sense is the centrality of space. Paul Zvkr inthe book of (City and Square) says, to create an artistic space is due to create an organized and limited space(Carmona et al., 2008) more practical solutions in creating a sense of security on the streets, include the following:

1-To create resolution: New construction should have this spatial quality. The continues spaces, with some signs that can help us. The role of building and how to enter it should be understandable from outside(Leontidou, 1993, 2010).

2. The visual permeability: permeability system of public spaces is due to the number of ways and potential access which is considered to pass from one point to another. This potential ways must be clear and visible. Small blocks, compared with larger blocks enhance visual permeability and public awareness and provide a greater use of options(Alatas, 2006).

3. Planning intersections: The condition of intersection and their design details is due to the kind of streets that are connected together; the survey by Oscar Newton showed that the distance of 90 meters from the block of intersection is suitable for most situations.

4-readablity: the quality that provides a place to be understandable. It is at two levels: physical forms and aspects of physical activity pattern. Lynch explains the physical aspects on 5 key elements. The five elements are: paths, nodes, edges, signs, spheres(Leontidou, 2010).

5. Physical adjustment and function: To the extend the functional role of the street is important, the need to adapt the organization particular and emphasis on legibility and readability of the application form is important, too. So,the consistency of the form with the type and density and importance is emphasized.

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The meaning of functions and categories of public spaces

Social life in the cities is not limited only to meet the material needs of citizens; In addition to the general requirements to meet the material needs of residents, the other immaterial and spiritual needs that have a kind of behavior and interaction between citizens is considered. By increasing the level of social welfare and urban development (until the 1960s, which was largely based on the material needs of city dwellers) notice of urban planners and administrators was focused on the public spaces of urban cities, where space in addition to meeting the financial needs of individuals was related to the possibility of exchanging views, ideas and thoughts, behavior, conflict, action, even in the realm of human emotions and dialogue was provided. In addition, the development of public spaces for citizens to interact and communicate with each other indirectly, in creating a culture of discipline and make use of public facilities which affect Concurrent great and good governance in cities(Alatas, 2006).

In addition to this, open spaces create a sense of trust and confidence, to help people and improve social cohesion. In fact, these spaces are more than places just for fun. What today raised these spaces serious is the need of residents, compared to the predecessors. Urban environmental conditions, and high-crowded, small place, with a variety of sound and the environment pollution has the economy that resident to leave the isolation of urbanization and access to the wider environment and interact with more open spaces and interact freely, make it possible to meet the public and provide an informal talk with a lower cost.

It is also urban open space for residents and an effect of collective life and meets the social needs of their citizens. In this space encapsulation social encounters are face to face. Citizens understanding of space and scale are so that it provides the variety of space variables. Addressee of the space range of social classes, age groups and so on(Thompson, 2002). So, the public space is not only a physical sense, but also the interaction of citizen engagement and urban activity that takes place in the city(Grimm et al., 2008). Today, it is believed that successful public spaces are spaces with different feature of today's age, sex, which can realize their will and their various activities.

Security in public spaces in the city (from Western scholars and theorists viewpoint)

Zvkyn in the book of culture of cities says that spaces are not safe enough for people to be involved in creating a public culture(Zukin, 1998). In response to fear of victimization makes many people avoid the dangers that this can lead to people not only avoid a specific place, but also public spaces(Streeck, 2005).

Sanandaj

Sanandaj is the center of Kurdistan province; this city is third most populated city after Urmia and Kermanshah among Iran's Kurdish cities. Also in this city political-Ideological authority by employing urban engineers and designers has sought for a functional system in order to supply maximum reproduction condition of dominant authority. It's here that administration; building and urban development should be studied. For example at the center of and old part of the city, "Sirus" street that has been constructed to cross this old part, so as to bring this part under the control (Map 1).

Qtarchyan region

This region is located in the South West of old region from one side toFerdowsi Avenue and from south to Keshavarz street and Marduk avenue. Qtarchyan is one of the oldest and big regions of the city. In addition to the main center, also have two sub-centers. The constructions are located in green spaces, religious places, the bathroom, cultural landmarks, schools, secondary schools and activity centerslike new sports facilities, office telecommunications, hotels and catering facilities, and various branches of the bank in the streets of this region (Map2).

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The motion patterns of the region

Mardukh is the only major pattern passing through the center of the region to other neighborhoods in the bond market and mosque. The region is also due to the large extent of the sub-center which is located on a hill. Its topography makes it the most routes to follow, step out of the ground which vehicle access to the area is difficult. The most difficult region is in the northern parts of the texture is crowded. Other parts of the region have a relatively open structure.

The effect of Urban spaces on the cultural aspects of a city and woman population over the city

The functional role of urban spaces as places of public activities and interactions of urban areas has always existed from time immemorial times. So that the activities of any age can be recognized by urban spaces and urban spaces through the activities and interests of citizens, or vice versa so there is a close relationship between the development of cultural, social and political life of a city and its urban spaces(Bacon & Blyton, 2006).

However, as color, light, form and govern the architecture of a space can even feel happy or sad attitude to the space. So, environment affects its inhabitants, urban open space is generally inducing freedom and civil rights, Where the deep sense of rage in there, do not be slow, indifferent, and without a doubt most urban spaces, cause cultural and political movements (Table 1-2).

Urban areas should provide facilities for all people, so that from the standpoint of physical and sensory characteristics compatible with all operators amusable for them. This need is investigated, especially in the cultural sense. Space can create a sense of disorientationor they can attract them to it so that they find the space as a field for their social life. On the other hand, if the space is not used because of convenience or fear, the public sphere disappears(Bagnasco, 2000). Crime prevention through environmental design can be a targeted approach to reduce crime in the artificial environment of the city that are effective in increasing social capital, quality of life, and increase citizens' satisfaction and thus improve welfare. Women due to cultural issues or insecurity can spend limited time outdoors and this is one of the serious limitations to their social activities and their presence in urban areas. Insecurity of women in urban areas limits their full participation in society restricts and In addition to the psychological trauma of the families, affects the whole community(Montgomery, 2008).Atmosphere of mistrust and lack of communication makes the citizens to show off their fears. Some urban spaces provide even more context of fear. Lack of adequate lighting in the streets, homeless and addicts sleeping in the streets and no sidewalks along highways are examples of them. The spaces of seeing and being seen in more places and in addition provide little chance to escape Provide less potential for criminal activity. Urban planners should pay attention to this point that build cities to handle this kind of needs. Relaxed urban atmosphere is maintained primarily by unconscious and complex social networks and standards among people.Eyes should always look at the street. The eyes of those whom we naturally know as real owners of streets. Sidewalks should be used on an ongoing basis and looking at the streets should be thought. Thus, by use of public participation we can prevent from happening Drama of barbarism. Crime increase with size of the city not with the population. The urban population means lack of physical space that would be both strength and oversight. If activities are combined and street design will reinforce the sense of security, especially for women and girls. If the security in urban environments grows larger, it enhances social communication between individuals in a community(Montgomery, 2008).They can build their own network of relationships and a sense of belonging to the community will be build. Increase social relations in networks between women will bring social capital. Emotional attachment as a fundamental element of social cohesion is the key factor of regional control because it makes sense for the community. The feeling of belonging to the community makes people feel they are in control of their community and society thinks about them and provides their security. Broad and active participation of women in the city provides an essential prerequisite and vitality, justice and public safety. Some residents of urban areas that provide more fear, makes the urban environment and its inhabitants free of any social link and feel less

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sense of security in regions in which the signs of neglect and failure and massed trash and unplanned building and broken windows are seen. In other words, in areas which the access to crime is easier, people avoid from social participation. So, this can provide the field for crime and it is the sign that resident are not interested in being involved in crime and handle it. So, the ricked environment brings more fear(Thompson, 2002).

CONCLUSION

Urban spaces are knots (nodes) and roads which while surrounded, should have activity and cheerfulness; such spaces should have particular and special physical and conceptual features to create cheerfulness and preserve it(Reichenbach, 2012). urban designing is a science that plans "improving the environment quality according to the people's and expert's behaviors and comprehensions creation and building urban space should be in harmony with human's functions and activities; also it should have all necessary conditions for human attendance [8] . This is an emphasis on urban landscape as an objectivity that indecently exists without human and perceived by him. Landscape of a city contains various information that could be categorized in two groups: Physical structure and in addition to physical structure, activity and attendance complete the appearance of a city attendance of different layers of community, creates another landscape of city which physical factors(elements) can only prepare "space" for people attending. For example a valuable work causes the presence of many tourists there and then various activities will begin. So, in addition to the aesthetics of structure, the existence of functions causes cheerfulness and attendance of people in urban spaces.

Penetration of some activities from stores into urban space is an effective agent (factor) for cheerfulness of urban space(Warner & Hefetz, 2002). For example customers seats in outer space of restaurants. Bindley M.A of architecture and planning(Reichenbach, 2012). Declaration of "urban landscape and appearance" meeting in many community (society), there are a lot of registered data about roughness (rudeness). This data are usually collected in order to clarify the relation between public space and rudeness (roughness) against women.

Because there are not enough security, in bigotries (metropolises) although the urban spaces are attractive and interesting but also are full of nostalgia, insecurity and horror and therefore for women urban spaces in comparison with men have less attractiveness (attractively)(Grimm et al., 2008). It's the quality of urban spaces function that confines women and confronts them with horror and insecurity. Socially it restricts women's activities attendance and freedom.

Women and men different biological features which affect (impress) on their relation to space. They expect the space, some special facilities which should be proportional to their physical and psychological needs and facilities their routine activities. Male is the source of space planning and space regulation, so the basic need taken into consideration would not meet women's needs and this has influence on women's relation to and utilization from space.

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Map 1: Location of Sanandaj
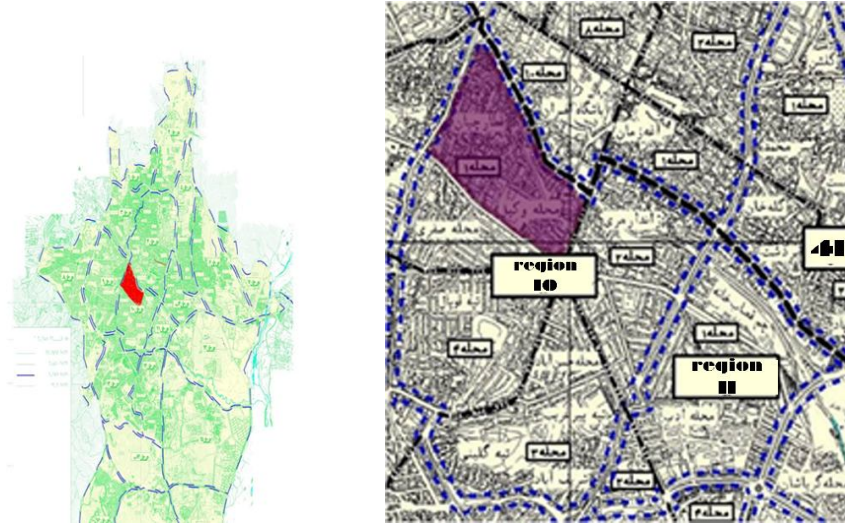
Map2: Location Area Qtarchyan

Table 1- The activity type–Attendance percentage and companionship type in urban spaces

The most companion type	The most times alternation in using these spaces	Participation percent	Activity type	Row
With friends	much	45	fun	1
With friends	low	35	dialogue	2
With family	Very much	60	purchase	3
With family and friends	Very low	15	rest	4
alone	Very low	5	studying	5
With friends	Very low	10	sport	6

Table 2-The weakness of women in using urban open spaces

The lack of safety in urban open spaces	1
The state of no variety of equipment and convenience for women	2
The lack of suitable urban spaces for women	3
The lack of easy use of spaces	4
The lack of suitable cultural use of space	5
The lack of suitable transportation system for women in urban spaces	6

RESEARCH ARTICLE

Study the Curriculum Literacy of Principles of Schools of Tehran in Education Year of 92-93

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ABSTRACT

This research intended to study the curriculum literacy of principles of schools of Tehran in education year of 92-93. Hence, a sample of 250 members of school principles of three educational period of primary, secondary and high school were selected with cluster random method via multistage. The data collection tool was the researcher's questionnaire of curriculum literacy. The reliability of the questionnaire was achieved 0/866 by Cronbach's alpha method. The achieved data were analyzed in two levels of descriptive and inferential. The result has shown that the school principles of school of Tehran have adequate teaching methods though they have inadequate curriculum literacy. Among the indicators of the targets of curriculum, the principles have suitable capability in using educational targets while they have less ability in development of educational goals. From the indicators of curriculum literacy indicators, the principles are literate in terms of adapting of the contents and activities of school books with general, partial and behavioral goals while they are less literate to interpret and analyze the school books scientifically. Among the indicators of literacy of teaching methods of curriculum, the principles are more literate in determining the difference between traditional and active methodologies, and they are less literate in the ability of preparation and selection of subjects and educational medium. From the indicators of literacy of educational assessment of curriculum, the principles are more literate in terms of familiarity with different assessment methods, and they are less literate in terms of revision methods of education.

Key words: Curriculum Literacy, Principle, Schools, Tehran

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INTRODUCTION

The educational system of any country requires principles who acquire high skills and experiences to perform the national educational curriculum effectively. Thus, improving the curriculum literacy of principles is of the basic necessities of national educational system. Literacy is an approved ability in communication skills that enables people to behave appropriately in a certain way in a society with their potential ability based on their age and individually (Bawden, 2007). Literacy program based on an independent approach can lead illiterate people toward better performance in economical field and keep them dependent scientifically forever. According to the independent approach from texture, it can be said that literacy is a simple cognitive skill which can be learnt. As a person learns playing with ball, hunting birds or setting fire, he can also learn to read and write. According to this approach, those who have mastered over these skills can use them to influence others and achieve a position (street, 1984).

Such a kind of interpretation of literacy is common in many countries though the achieved education is not consistent with the targeted one. However, some of literate people have higher economical and cognitive status comparing with illiterate in the framework of this approach. It is simplistic to think that all literate people have higher cognitive status and better financial status .Also, it cannot be assumed that all the people who are not literate in the scale of this approach are lagged who have low cognitive ability and financial problems since we frequently face with literate people who cannot even have effective performance in their own profession. What is predicted by the independent approach of texture is not always true in real life circumstances. This approached changed into another approach of literacy during 1970 and 1980s which is now acceptable in the field of education which is called an ideological approach to literacy (Danayetoosi and Kiamanesh, 1388). In this approach, literacy is referred to a collection of abilities which is too further than reading and writing .Instead of the mere meaning of reading and writing of texts, it means encoding and decoding of information in all the forms which are used by human being (multi-task literacy of verbal, narrative, audial, oratory, visual).It also considers the influence of technology and new methods of information processing. In another word, achieving literacy requires a large scale of skills and knowledge which is crucial for using its information and their procession as well as reaction towards the available technology in a society. Moreover, the multi-task ability of literacy is based on the ideological approach of a society influenced by its social-cultural aspect or more clearly affected by its values, targets and goals which cannot be without any direction (street, 1984). Such literacy is not only variable based on the time and place but also it challenges the political relations. Thus, the subject of critical literacy arises. Critical literacy is an application of language which emphasizes the empowering role of literacy in reforming the individual's world. Achieving such literacy requires understanding of social and cultural variations, sensitivity towards them, and understanding this point that the meaning of each forms of communication (verbal, oratory and visual) depends on the cultural and social context, the purpose and the audience (the curriculum framework of Western Australia from preschool level to 12th, 1998).

The main feature of critical literacy is the knowledge of the relation of language and power. In another word, achieving to political resources is possible by forming language skills. This means that language control and relation empower people and depower others. Also, language can be used to effect on others behavior and employ language knowledge and its performance for controlling others (Gutierrez, 2008). Any individual with such literacy, collecting suitable information, organizing and defining specified targets use it as a tool to achieve desired goals and production of knowledge. This person can think about his mistakes and use his literacy to correct them The official declaration of UNESCO in united nation organization (2012-2013) about literacy decade raise a new interpretation of literacy. In this declaration, multi-task and multi-aspect literacy was considered (Sheifer, 2003). According to UNESCO, literacy does not merely mean reading and writing but multiple abilities and skills which communication abilities are the heart of it. For instance Green (1998) and Lanc shier (1997 reported by Shifer, 2003) classified different types of literacy or abilities as follow: Operational literacy ,that means ability of reading and writing in multi-fields Cultural literacy, that means understanding issues considering their contexts.Critical literacy, that means ability to participate in social tasks and attempt to reform and improve the.key aspect of any educational programming is the definition of literacy first and second, determining the best teaching method of literacy according to the facilities of

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each country. Educational programming forms literacy and determined its transferring method to the people of society (Lydykt, 2007). Today, educational programming is not only a declaration about appropriate literacy and achieving methods of educational goals but the necessary knowledge and skills for participating in economic and social world. The emphasis on literacy is that globalization in social and economic fields made the issues related to literacy programming more complicated than offering an educational programming. This does not mean that literacy programming is only programming of improvement of teaching methodology of one specific written literacy but understanding and conceptualizing of literacy, education context, education texture, as well as different aspects of literacy (written, verbal, audial, oratory and visual) should be considered. School principals shall have high awareness and knowledge of curriculum program and its indicators to perform the targeted programs effectively. If they do not acquire such knowledge, the practice of the intended curriculum fails. School principals shall have multi-aspect literacy. Exploring the literature of multi-literacy, it can be concluded that one aspect of school principals, literacy is curriculum literacy that means having enough knowledge about curriculum to practice it successfully. This research attempts to explore the literacy of school masters of high schools in Tehran in education year 92-93 according to ideological approach. To what extend the school principles of Tehran acquire curriculum literacy and what are their weak and strong points of educational curriculum; what solutions are needed to elevate their curriculum literacy? Thus, this research is seeking to answer such a kind of questions.

Statistical population

The statistical population of this research includes all the school principles of primary, secondary and high schools of Tehran in education year of 1392-93 which their total number equals to 2550 according to the report of educational administration of Tehran. Sample volume: since the variance of the statistical population is not clear in this research, it is essential to have a primary study over the people of society to determine the variance of that society. Hence, one group with 30 people was chosen randomly from statistical population, and a questionnaire was distributed among them, and after extraction of the data related to the replies of the group the statistical sample of the research was selected by the help of Cochran formula (Hosseini, 1382).Therefore, the minimum sample volume of this research was 250 members from the distributed 260 questionnaires which 250 were flawless and analyzed.

Sampling method: that is multi-stage cluster random sampling in a way that the principles were selected among the primary, secondary, and high schools of Tehran randomly. Data collection tool: A questionnaire based on curriculum literacy made by the researcher was used in this research according to the topic and its methods.Curriculum literacy questionnaire is a self-made questionnaire of the researcher which is compiled based on four basic principles of curriculum as aims, content, educational Imethods, and assessment methods. This questionnaire has 47 questions which are responded as Five point Likert scale. Table 1 illustrates the correspondence questions of curriculum literacy and its indicators.

Answering to this question, the internal consistency method was used. In this method, the consistency or uniformity of the component parts of a test is emphasized (Seif, 1384). Cronbach alpha coefficient was used to calculate the internal consistency of the questionnaire made by the researcher. The reliability refers to the accuracy of measuring tools during time or repeated used of tools or tests. In another word, reliability refers to this point that to what extend measuring tools reach to similar results in similar conditions and it is related to partial measuring error. There are multiple methods to determine the stability. Determining the stability of the questionnaires, Cronbach alpha coefficient was employed and internal consistency of items and stability of the tools for ensuring. Cronbach alpha coefficient was used to assess the stability of the questionnaire. Calculating Cronbach alpha coefficient requires that the variance of samples of each classification of questionnaire questions and the total variance are calculated (Sarmad et al, 1379). Reliability means the stability degree of test scores which is achieved by retesting of specific persons in the same or variable conditions. Validity of test answers to this basic question that what the test is measuring and to what extend it is efficient in this regard (Fathi Ashtyani, 1391). The validity and reliability of the questionnaire of

curriculum literacy: In this research, reliability is calculated by Cronbach alpha coefficient which the total reliability and its indicators are offered in table2-3.

Data analysis method

The data analyses of this research were performed in two levels of descriptive statistics and inferential statistics. In the descriptive statistic , abundance , percentage, average, standard deviation were used while for inferential level,the single-sample t test ,independent t test, One-way analysis of variance, and Friedman's non-parametric test were employed. Data collection method: the researchers go the permission first according to the regulation of educational administration of Tehran to enter to the schools and practice the tests on the principles according to their gender and field based on the demographic table designed by the experts of high school. Distributing the questionnaires, some principles were randomly selected by presenting in the schools according to their dispersion and sampling methods. The questionnaires were distributed after explanation for the principles in terms of research targets and answering methods to the questions.

RESULTS

Overall question: How much is the curriculum literacy of the school principles of the schools of Tehran?
The results of table 3 indicates that the curriculum literacy of school principles of schools of Tehran is significantly (P<0.01) more than average (μ=3).This finding indicates that the curriculum literacy of school principles of Tehran is in good condition.

First question: How much is the educational aims of school principles of schools of Tehran?
The results of table 4 indicates that the educational aims of school principles of schools of Tehran is significantly (P<0.01) more than average (μ=3).This finding indicates that the educational aims of school principles of Tehran is in good condition.

Second question: How much is the literacy of educational contents of school principles of schools of Tehran?
The results of table 5 indicates that the educational content literacy of school principles of schools of Tehran is significantly (P<0.01) more than average (μ=3) .This finding indicates that the content literacy of school principles of Tehran is in good condition.

Third question: How much is the literacy of educational methodologies of school principles of Tehran?
The findings of table 6 illustrate that the literacy of educational methodologies of school principles of Tehran is significantly (P<0.01) more than average (μ=3).This finding indicates that the teaching methodology literacy of school principles of Tehran is in good condition.

Question 4: How much is the literacy of educational assessment of school principles of Tehran?

The findings of table 7 illustrate that the literacy of educational assessment of school principals of Tehran is significantly (P<0.01) more than average (μ=3).This finding indicates that the assessment literacy of school principles of Tehran is in good condition.

DISCUSSION AND CONCLUSION

The results of the assessment of the research hypothesis are offered as follows:

General question: How much is the curriculum literacy of school principles of Tehran? The result of the general hypothesis of the research indicates that the curriculum literacy of school principles of Tehran is in good condition.

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First question: How much is the educational target literacy of school principles of Tehran? The result of the first hypothesis of the research indicates that the educational target literacy of school principles of Tehran is more than average. This finding shows that the educational target literacy of school principles of Tehran is in good condition.

Second question: How much is the educational content literacy of school principles of Tehran? The result of the second hypothesis of the research indicates that the educational content literacy of school principles of Tehran is more than average. This finding shows that the educational content literacy of school principles of Tehran is in good condition.

Third question: How much is the educational methodology literacy of school principles of Tehran? The result of the third hypothesis of the research indicates that the educational methodology literacy of school principles of Tehran is more than average. This finding shows that the teaching methodology literacy of school principles of Tehran is in good condition.

Fourth question: How much is the educational assessment literacy of school principles of Tehran? The result of the fourth hypothesis of the research indicates that the educational assessment literacy of school principles of Tehran is significantly (P<0.01) more than average. This finding shows that the educational assessment literacy of school principles of Tehran is in good condition. The results of analysis of educational literacy indicators illustrated that all the indicators of educational target literacy of school principles of Tehran is more than average. This finding indicates that educational target literacy of school principles of Tehran is in good condition. All the indicators of educational literacy of school principles of Tehran are more than average. This finding shows that the content literacy of school principles of Tehran is in good condition.

All the indicators of educational methodology literacy of school principles of Tehran are more than average. This finding shows that the teaching methodology literacy of school principles of Tehran is in good condition. All the indicators of educational assessment of school principles of Tehran are more than average. This finding shows that the educational assessment literacy of school principles of Tehran is in good condition.

The analysis of the importance order of the indicators of educational literacy demonstrated that the teaching methodologies of the school principles of Tehran is in the first ranking, the educational assessment literacy is in the second ranking, the educational target literacy in the third ranking, and educational content literacy is in the last ranking. The analysis of curriculum literacy and its indicators based on Demographic variables indicated that educational curriculum literacy and its indicators are not different among the male or female school principals of Tehran. This finding indicates that the curriculum literacy and its indicators are the same among the male or female school principles of Tehran.

Curriculum literacy and its indicators, educational methods and assessment methods are not different among the single or married school principles of Tehran. This finding indicates that the curriculum literacy and targeted indicators, teaching methods and assessment methods are the same among the single and married school principles of Tehran but educational content indicator is different among the single and married school principles of Tehran. Educational curriculum literacy and its targeted indicators ,assessment methods of school principles of Tehran are not different based on their education though the indicators of educational content and teaching methodology is different according to their education. Content literacy and teaching methods of school principles of Tehran who have undergraduate education is less than principles with bachelor or master degree.

Curriculum literacy and its targeted indicators, content and teaching methods of school principles of schools in Tehran are not different based on their educational level but educational assessment indicator of the principles is different based on their educational level. The educational assessment literacy of school principles of Tehran who are at the secondary school is less than principles who work in high school. The curriculum literacy and assessment

methods of school principles of Tehran is not different in terms of their age but the indicators of targets, content and teaching method of school principles of schools of Tehran is different in terms of their age. The educational target literacy of principles who are more than 50 is more that the principles who are less than that. Also, the educational content literacy of principles who are less than 40 is more that older principles.

The teaching methodology literacy of principles who are more than 50 is more that the principles who are less than that. The curriculum literacy and its indictors expert educational content is different among the school principles of Tehran based on their working experience. Curriculum literacy and its indicators such as educational targets, teaching methods, and educational assessment of school principles of Tehran who have more than 20 years working experience is significantly more than principles who have less working experience. But the indicator of educational content of school principles of Tehran is not significantly different based on their working experiences. Totally, the results of the research have shown that the school principles of Tehran have suitable curriculum literacy thought they are lower than others in terms of other areas of curriculum literacy. The principles are in good condition in terms of teaching methodology literacy and they have unfavorable condition in terms of content literacy. Among the indicators of educational target literacy, the principle are able to use educational behavioral literacy and they have less ability on compiling educational targets. Among the indicators of educational content literacy, the principles have the highest literacy in terms of adjusting the content and the activities of textbooks with general, specific and behavioral targets while they are less literate in analytic power of school books. Among the indicators of teaching methodology literacy, the principles are more educated in terms of differentiation of traditional and active teaching methods while they are less literate in terms of preparation and selection of teaching resources and medium. Among the indicators of educational assessment literacy, the principles are literate inn terms of familiarity with different sorts of assessment but they are less literate in terms of revision methods of literacy. The applicable suggestions based on the findings of this research are offered as follow: according to the result of the first question of the research, it is suggested that some suitable education shall be offered to raise the principles, literacy of compiling educational targets. According to the result of the second question of the research, it is suggested that some suitable education shall be offered to raise the principles, literacy for scientific analysis of the school books. According to the result of the third question of the research, it is suggested that some suitable education shall be offered to raise the principles, ability to prepare and select educational materials and medium. According to the result of the fourth question of the research, it is suggested that some suitable education shall be offered to raise the principles, literacy of educational revision. Some research suggestions are offered as the results of this research: studying curriculum literacy by qualified method that means using interview technique for collecting information, studying the curriculum literacy of school teachers, comparing educational curriculum literacy of school principles and teachers. Comparing the educational curriculum literacy of principles of educational zones. Applicable suggestions: According to the result of the first question of the research, it is recommended that some suitable education shall be offered to increase principles, literacy in terms of compiling educational targets. According to the result of the second question of the research, it is recommended that some suitable education shall be offered to increase principles, literacy in terms of scientific analysis of school books. According to the result of the third question of the research, it is recommended that some suitable education shall be offered to increase principles, literacy in terms of preparing and selecting teaching material and educational medium. According to the result of the fourth question of the research, it is recommended that some suitable education shall be offered to increase principles, literacy in terms of revision methods of education. Research suggestions: According to the results, it is suggested: studying curriculum literacy by qualified method that means using interview for collecting information, exploring educational curriculum of school teachers.

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Table 1. Distribution of correspondence of questions of curriculum literacy and its indicators

	Number of questions	questions
Educational aims	14	14 - 1
Educational content	7	21 - 15
Educational methods	13	34 - 22
Assessment methods	13	47 - 35
General questionnaire	47	47 - 1

Table 2. Reliability coefficient of curriculum literacy questionnaire and its subscales

	Number of questions	Reliability coefficient
Educational aims	14	0/922
Educational content	7	0/846
Educational methods	13	0/906
Assessment methods	13	0/928
General questionnaire	47	0/964

Table 3. A summary of the results of single-sample t test of curriculum literacy of school principles

	Number	Mean	Standard deviation	μ=3		
				t	df	Sig.
Curriculum Literacy	250	3/80	0/49	25/67	249	0/0001

Table 4. A summary of the results of single-sample t test of educational aims of school principles

	Number	Mean	Standard deviation	μ=3		
				t	df	Sig.
Educational aims	250	3/81	0/51	24/89	249	0/0001

Table 5. Summary of single-sample t test of educational content literacy of school principles

	Number	Mean	Standard deviation	μ=3		
				t	df	Sig.
Educational content literacy	250	3/64	0/63	16/07	249	0/0001

Table 6. Summary of single-sample t test of educational methodology literacy of school principles

	Number	Mean	Standard deviation	μ=3		
				t	df	Sig.
Educational methodology	250	3/90	0/54	26/29	249	0/0001

Table 7: The summary of single-sample t test of educational assessment literacy of school principles

	Number	Mean	Standard deviation	μ=3		
				t	df	Sig.
Educational methodology	250	3/85	0/60	22/27	249	0/0001

RESEARCH ARTICLE

The Effect of Different Levels of Savory Essential Oil in the Drinking Water of Broilers on Performance, Carcass Parameters and Some Blood Metabolites

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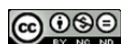
ABSTRACT

This study was aimed to investigate the use of savory essential oil on performance, carcass parameters of broiler chickens. Four hundred and twenty day old broiler chickens (Ross 308) was used in a completely randomized design with 6 treatments and 5 repetitions. The experimental groups consisted of control, Tween (a solvent for dissolving savory essential oil in it and then water) to the amount of 1000 ppm, 100, 200, 300, 400, savory essential oil ppm were mixed in tween in drinking water for broiler chickens during the growth period. The results show that adding savory essential oil to the drinking water of broiler chickens at ages 7 to 42 days makes a significant decrease in live weight and feed intake by broiler chickens compared with the control group (P<0.05), but in the final and whole period, the effect of adding savory essential oil to the drinking water of broiler chickens doesn't have any significant effect on the relative weight of the carcass breast, thighs, lymphoid organs' relative weight, bursa of fabricius, thymus and spleen. Treatments had no effects on blood parameters of glucose, creatinine, uric acid and cholesterol. Based on the results of this investigation it seems that savory essential oil in drinking water had negative effects on broiler performance.

Key words: Savory essential oil, broiler, performance, carcass and blood parameters.

INTRODUCTION

Increasing population and tendency to urbanization, shortage of critical factors such as food, water and even the air will follow. It is evident that providing enough resources for current population has been associated with some limitations. Global dimensions of food security are diverse and broad. Although some countries in terms of nutritional indicators show ideal digits, food poverty in many developing countries has become a serious problem. Despite having significant structural reforms that have been achieved in the production sectors, nevertheless Iran with a population of about 75 million far from optimal food system. On the other hand, given that 60-70% of the poultry's production cost is related to feed, providing feed for poultries is important. In order to providing the food requirements of the world population, it doesn't seem the perfect solution to increase the area under cultivation of crops and increasing the number of livestock units due to existing limitations. Therefore, the efficient use of available feed resources is the solution that it seems more appropriate. Also use of antibiotics in this regard has dating back for more, but use of it in poultry's ration due to concerns about resistance of pathogens factors to antibiotics, it has been removed from the rations of poultries and other farm animals [3, 4, 7, 8 and 9].

In Europe, removing the antibiotics from poultry rations causes death and disease, especially those Necrotic Enteritis, and reduce the performance [3 and 7]. Enzymes, probiotic, prebiotic, essential oils, and organic acids are alternatives that gradually were recommended by scientists [1, 2, 5, 6, 9, 10, 11, 12, 13, 14, 15 and 16].

Some medicinal plants by having effective components such as phenols, terpenoids, extracted volatile oil, alkaloids, lectins and etc, they have antimicrobial effects, improve digestion, reduce lipid concentrations and cholesterol levels and antioxidant properties, and ultimately to improve poultry growth [13, 14, 15 and 16]. In different studies, different forms of drug plants have been studied such as their powder and essences, but among of conducted studies on plant or savory essential oil have been more limited and due to the difference between the grown savory essential oil compounds in different regions, need to explore a variety of native plants and their effects on various parameters of broiler chickens becomes obvious. Savory is an annual grass with green leaves covered with dark gray narrow cross, flowers are small, white or dark red . The essential oil of this plant is about 30 to 35 percent. This plant contains effective consisted of Carvaecrol, 40 to 50 percent Thymol, Alph-beta Pinene, and Linalool [4].

Cross et al (2007) have been studied five plants, savory (Satureia Hortensis), Yarrow rosemary, Marjoram (a rate of 10gon10 kg) and their essential oil(a rate of 1g on 10 kg) on growth and digestibility in 7 to 28 days broiler chickens. The essential oil of thyme (Thymus vulgaris) and yarrow plant have the greatest effect on performance, while the savory (Satureia Hortensis) and Yarrow essential oil had little effect. Jang et al (2007) have been studied the effect of a mixture of essential oil including Thymol and Carvaecrol in both 25 and 50 mg levels on secretion of digestive enzymes. Essential oils increased trypsin, Alpha-amylase, and pancreas' activity than the control group and the group was contained antibiotics. Lee et al (2003a) concluded that effect of Thymol and carvacrol on plasma lipids of 200 mg per kg broiler chickens, decreased triglycerides and plasma phospholipids and had not any effect on HDL.

The goal of this investigation was to study the effect of the use of savory essential oil in drinking water on performance traits, carcass associated parameters, relative immune system organ weight and blood metabolites of broiler chickens.

MATERIALS AND METHODS

In this experiment 420 one day old broiler chickens (Ross 308) with 6 treatments and 5 repetition in a completely randomized design was placed on 30 groups. During the testing three types of starter, grower and finisher ration for days 0-7, 8-21 and 22-42 respectively during 42 days was fed to broiler chickens. To make savory essential oil soluble

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in water at a ratio of 2 to 1, it was mixed with a substance called Tween. Tween possible effects are considered on performance and studied indicators of an experimental treatment that broiler chickens were fed into the treatment alone with Tween in the experiment. All factors such as temperature, light, water, ventilation and vaccination were similar for all treatments and based on local veterinary office.

Supplied per kg of vitamin mixture : Vitamin A: 7.2gr; Vitamin D: 7. gr; Vitamin E: 14.4gr; Vitamin K3: 1.6gr; Vitamin B1: 0.72gr; Riboflavin: 3.3gr, Pantothenic acid: 12gr, niacin: 12160 mg; Vitamin B6: 6.2 mg; Biotin: 0.2 gr; Vitamin B12 - 0.6 gr; choline chloride 440.

Supplied per kg of mineral mixture: manganese (oxide): 64 gr; iron (FeSO4) -100 gr; zinc (oxide): 44 gr; copper (CuSO4):16 gr; iodine (calcium iodate): 64 gr; selenium (1%): 8 gr; cobalt :0.2 gr.

Performance

At the end of each period, the weight of all chickens in each experimental unit was measured by scales with accuracy of 5 grams. To calculate the body weight of broiler chickens in each experimental unit by digital scales with accuracy of 5 grams at the end of days 7, 21 and 42, were weighed. Consumed feed on daily basis and the chicks were weighed and it placed to chickens. Changes in consumed rations are measured from starter ration to growth ration and from growth ration to final ration, then remaining feed was deducted from the amount of consumed feed. If there are losses in the experimental unit, the amount of consumed feed was corrected according to the live chickens. Feed conversion ratio in 0 to 7, 8 to 21, 0 to 21, 22 to 42 and 0 to 42 days of life were calculated. This conversion ratio was calculated by gain dividing to feed intake for each period.

Carcass parameters

At the end of 42nd day of each treatment of breeding period, 3 randomly selected chickens were slaughtered after weighing. After slaughtering and blood draining, carcass weighed. Then manually feathers done with warm water, then the head and legs separated from the hocks. In this case, the carcass was weighted to calculate the carcass without feathers.

Thighs are divided from the middle to the tight and the drumstick were weighed as a pair of left and right. Each bird's breast muscle was carefully separated with skin and weight were measured and recorded using a digital scale. Because lymphoid organs are somehow representative the immune system, any changes in the relative weight of these parts could indicate as well as change in the efficiency of the immune system. In order to determine the weights of spleen, thymus and bursa of fabricius, these organs are separated and weighed from the abdominal area, the neck area and under the cloac. On 42th day from each treatment, 3 poultry selected randomly and blood samples were taken from jugular vein and the parameters of cholesterol, glucose, uric acid and creatinine were analyzed by Pars Azmoon kits.

Statistical analysis: All data were analyzed using GLM model of SAS [18] (SAS Institute Inc, 2008) for analysis of variance. Significant differences among the treatments were identified at 5% level by Duncan's multiple range tests.

RESULTS AND DISCUSSION

Adding savory essential oil to drinking water of chicken in the ages of 7 and 42 days resulted in a significant decrease in chickens' live weight compared with the control group (Table 2). It also features 21 day weight of chicks fed with

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savory decreased but this decrease was not statistically significant. In 42 days of life, treatment differences increased with increase of savory density in drinking water and the weight loss was higher.

Tween: Tween 1000 parts per million,**Savory 100:** 100 parts per million Savory oil +200 parts per million Tween, **Savory 200:** 200 parts per million Savoryoil +40 parts per million Tween, **Savory 300:** 300 parts per million Savory oil +600 parts per million Tween, **Savory 400**: 400 parts per million Savory oil +800 parts per million Tween.

a-b Comparisons column for each period.

Tween: Tween 1000 parts per million,**Savory 100:** 100 parts per million Savory oil +200 parts per million Tween, **Savory 200:** 200 parts per million Savoryoil + 40 parts per million Tween,**Savory 300:** 300 parts per million Savory oil + 600 parts per million Tween, **Savory 400**: 400 parts per million Savory oil +800 parts per million Tween.

a-b Comparisons column for each period.

The daily weight gain in periods 0-7, 22-42, and 1-42 days, adding Savory essential oil of different levels of drinking water for broiler chickens caused a significant reduction in this parameter (Table 3).

Of course, the 8-21 and 1-21 day periods, adding a savory essential oil to drinking water of broiler chickens caused reduction of daily weight gain, but this reduction was not statistically significant. The highest daily weight gain at 42 days of life is related to the control and treatment of water was added Tween. Tween alone determines the chicks had not any negative impact on performance. In the same period the least amount of body weight and daily weight gain was related to treatments that levels of 200 and 300 parts per million savory was added to their drinking water.

Tween: Tween 1000 parts per million,**Savory 100:** 100 parts per million Savory oil +200 parts per million Tween, **Savory 200:** 200 parts per million Savoryoil + 400 parts per million Tween, **Savory 300:** 300 parts per million Savory oil + 600 parts per million Tween, **Savory 400**: 400 parts per million Savory oil +800 parts per million Tween.

Adding different levels of savory essential oil caused a significant reduction in feed intake treatments than the control group (Table 4). The pattern of feed consumption than savory oil doesn't have a certain pattern, but in general, it can reduce consumed feed by adding savory essential oil to drinking water of chickens.

Tween: Tween 1000 parts per million,**Savory 100:** 100 parts per million Savory oil +200 parts per million Tween, **Savory 200:** 200 parts per million Savoryoil + 40 parts per million Tween,**Savory 300:** 300 parts per million Savory oil + 600 parts per million Tween, **Savory 400**: 400 parts per million Savory oil +800 parts per million Tween.

The impact of adding essential oil of savory in drinking water of broiler chickens on days 0-7, 8-21 and 0-21 is not significant, but in the final and whole period, the impact of the savory essential oil to drinking water and was observed and increased the conversion rate significantly ($P > 0.05$), but this is the exception that has been fed treatment with 400 parts per million savory essential oil that causes significant reduction in conversion efficiency compared to the control group (Table 5). The highest conversion rate corresponding to 100 parts per million, which has been fed by the amount of consumed feed is greater than other treatments.

Impact of savory essential oil on carcass parameters

Adding savory oil levels in drinking water of broiler chickens has not significant effect (Table 6) on the relative weight of the carcass without feathers or even a certain pattern, breasts, thighs. Different levels of the essential oil of

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savory in broiler chickens drinking water had not any effect on the lymphoid organs of weight of bursa of fabricius, thymus and spleen. In this experiment, adding savory essential oil to experimental treatments had not any effect on serum metabolites (data not shown).

Tween: Tween 1000 parts per million,**Savory 100:** 100 parts per million Savory oil +200 parts per million Tween, **Savory 200:** 200 parts per million Savoryoil + 40 parts per million Tween,**Savory 300:** 300 parts per million Savory oil + 600 parts per million Tween, **Savory 400**: 400 parts per million Savory oil +800 parts per million Tween.

According to this research results can be concluded that adding savory essential oil to drinking water of chickens has a negative effect on feed intake, resulting in weight gain of broilers that the major reason for this observation can be reduce water consumption, reduce the rate of digestion feed and in the gut and intestinal microbial population is likely to change. Probably bitter taste of water caused lower water and feed consumption and concluded lower performance [9, 10, 17, 19, 20 and 21].

Of course the reduction in water consumption can be reduced by feeding with savory water disposal helped birds and poultry in order to improve ventilation and it is also useful to reduce coccidiosis disease. Different levels of savory essential oil in drinking water had no effects on blood metabolites in parallel with other investigation [9]. Based on the results of this investigation it seems that savory essential oil in drinking water had negative effects on broiler performance.

ACKNOWLEDGMENTS

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Table 1. Experimental rations related to rearing period			
Ingredients%	**Starter**	**Grower**	**Finisher**
Corn	53.58	56.15	65.65
Soybean meal	40.69	37.46	28.65
Sunflower oil	1.45	2.50	2.33
Di-calcium phosphate,	1.56	1.44	1.01
Shell powder	1.28	1.36	1.15
Salt	0.27	0.3	0.3
Baking soda	0.1	0.03	0
Mineral supplements	0.25	0.25	0.25

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Vitamin supplements	0.25	0.25	0.25
HCL-Lysine	0.19	0.17	0.15
DL-Methionine	0.31	0.03	0.22
Threonine	0.07	0.06	0.04
Metabolizableenergy(Kcal/kg diet)	2850	2950	3050
Crude protein	22.50	21.35	18.15
Lysine	1.38	1.28	1.05
Methionine	0.63	0.6	0.49
Methionine + cysteine	0.99	0.95	0.8
Threonine	0.93	0.87	0.73
Calcium	1.05	0.97	0.86
available phosphorus	0.5	0.46	0.4

Table 2. The effect of savory essential oil on broiler chicken body weight at 42 day (g)			
Treatment	Day 7	Day 21	Day 42
Control	102.00a	503.23	2282.32a
Tween	92.44bc	520.45	2265.81a
Savory 100	93.32bc	514.78	2144.45ab
Savory 200	84.43bc	458.43	2005.08c
Savory 300	88.63bc	470.33	1890.94c
Savory 400	82.27c	467.68	2125.08ab
P-value	0.027	0.45	0.010
SEM	1.32	10.33	28.16

Table 3. The effect of essential oil savory on daily weight gain (g/d/chicken) broilers.					
Treatment	0-7	8-21	1-21	22-42	1-42
Control	14.57d	28.66	23.96	84.72d	54.34c
Tween	13.21bc	30.57	24.78	83.11cd	53.95c
Savory 100	13.35ab	30.10	24.51	77.60bcd	51.06bc
Savory 200	1206abc	28.64	23.11	72.36bc	47.74abc
Savory300	12.66abc	27.26	22.40	67.64a	45.02a
Savory 400	11.75a	27.53	22.27	78.92bcd	50.60
P-value	0.036	NS	NS	0.002	0.008
SEM	0.31	0.63	0.54	1.34	0.71

Table 4. The effect of Savory essential oil in water on Feed intake of broiler chickens (g/d/chicken).

Treatment	period				
	0-7	8-21	1-21	22-42	1-42
Control	140.56cb	685.43bc	825.99bc	3560.12bc	4386.11bc
Tween	131.42bc	697.45c	828.87c	3545.78abc	4374.65bc
Savory 100	130.23b	702.66c	832.89c	3670.01c	4502.90c
Savory 200	129.78b	656.16ab	785.94ab	3300.23ab	4086.17ab
Savory 300	133.32bc	623.54a	756.86a	3190.76a	3947.62a
Savory 400	126.50a	622.31a	748.81a	3280.11ab	4028.92ab
P-value	0.00	0.00	0.00	0.003	0.004
SEM	0.65	11.31	12.13	47.82	55.68

Table 5. The effect of essential oil savory on feed conversion ratio of broiler chickens.

Treatment	0-7	8-21	1-21	22-42	1-42
Control	1.38	1.71	1.64	2.00a	1.92a
Tween	1.42	1.63	1.59	2.03ab	1.93ab
Savory 100	1.39	1.67	1.62	2.25c	2.10c
Savory 200	1.53	1.64	1.62	2.17bc	2.04abc
Savory 300	1.50	1.63	1.61	2.24c	2.09bc
Savory 400	1.53	1.61	1.60	1.98ab	1.90a
P-value	NS	NS	NS	0.00	0.03
SEM	0.39	0.46	0.044	0.039	0.054

Table 6. The effect of essential oil savory on carcass parameters (% BW).

Treatment	parameters					
	carcass	breast	thigh	bursa	spleen	thymus
Control	75.66	21.16	19.24	0.003	0.0011	0.005
Tween	75.29	20.58	18.67	0.003	0.0011	0.004
Savory 100	74.45	21.40	18.95	0.002	0.0010	0.004
Savory 200	76.18	19.85	17.64	0.003	0.0011	0.005
Savory 300	75.73	20.78	18.51	0.002	0.0010	0.004
Savory 400	74.77	20.95	18.05	0.003	0.0011	0.004
P-value	NS	NS	NS	NS	NS	NS
SEM	1.46	0.51	0.43	0.0002	0.0001	0.0000

RESEARCH ARTICLE

The Relation between Attachment Styles, Personality Dimensions and Assertiveness with Extent of Tendency toward Narcotic Drugs

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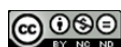
ABSTRACT

Today, drug consumption is more common among young, thoughtful and educated people and the age of using drugs significantly decreased. The aim of this study is to investigate the relationship between attachment styles, personality dimensions, assertiveness and the extent of tendency toward narcotic drugs. The statistical community, in the above–mentioned research, all the students of psychology, art and architecture studying in western Mazandaran Azad universities, who were 2420 in total and of all this number, 237 students were considered to be the sample volume using the available sampling method by the statistic community. The study was a descriptive survey in the area of root-seeking approaches. Instruments included scales to assess adults' attachment styles, the Eysenck questionnaire for adults, the Gambril and Richey's assertiveness questionnaire (1975), and scale of reading for addiction (2006). Our findings indicate that the relationship between the variables of attachment styles, personality dimensions and assertiveness with tendency to drug addiction is considerably significant (P<0.01). In addition, the results of multi-variable regression analysis indicate that the linear combination of attachment styles, personality dimensions and assertiveness is capable to predict the tendency toward drug addiction (P<0.01). Drug tendency based on variables- attachment styles, personality dimensions, and assertiveness- is predictable.

Key words: Attachment Styles, Personality Dimensions, Assertiveness, Narcotic Drugs

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INTRODUCTION

Social and political analyzers believe that narcotic drug is the most important factor of decay and moral decline in cultural invasion and influence. Iran is not only considered as one of the main transit path of narcotic drugs due to its same border with the biggest center of narcotic drug producer but also as a suitable market for the produced drugs of Afghanistan. Unfortunately, the expansion of drug abuse among youth has become more common, and it even includes the educated and intellectuals of the society while the development age has significantly decreased. The quick analysis of the addiction status in 1389 indicated that about 44.6 percent of the addicted population are under 29 (Narenjiha & et al.). The university students of a society are also in danger of being addicted to drugs. The studies related to drug abuse among the students of university offered different data but most of the findings emphasize on the use of illegal drugs among the students of universities (Taremian, 2009). For example, Dehghani & et al. (1389) reported the spread of narcotic drugs 21.5% among university students.

Drug addiction is a bio-psycho-socio-spiritual illness (Galanter, 2006). Answering to this question that why people get addicted to drugs is always difficult since one mere specific problem does not lead a person toward addiction .In fact, a combination of multiple factors pave the ground for tendency to addiction (Shokarzadeh, 1391). Various variables as predictable variables were explored in terms of drug dependency in clinical researches which are divided in four categories: A) Cultural-social factors B) inter-personal factors C) psychological-behavioral factor, and D) Bio-genetic factors (Newcomp & Richardson, 2000; Letteri, 1985).

Studying the previous researches, it seems that other variables including attachment styles, extraversion-introversion character dimension, and assertiveness may have a close relation with tendency to drugs (Mohammadzadeh & et al., 1391; Danesh & Azadi, 1385; Hajhasani & et al., 1391). Sroufe & et al. (2005) defined attachment as follow: attachment can generally mean a shelter of comfort, security of exploration and research, and a source of assurance to a child while he faces anxiety. This pattern can be secure, anxious-ambivalent, and avoidable (Mikulincer & Florin, 2001). Although the starting cause of drug abuse can be simple curiosity, the continuation factor of drug abuse can be related to attachment styles. Departure of security resource section can have connection with dissociation of one's connection with surrounding human resource and his tendency toward drug abuse for escaping from fears, anxiety, In fact, addiction can be defined as an interaction of individual, drugs, and environment. Practically, drug becomes a medium between an individual and environment, and a secure relation with environment is formed by drug. It is interpreted that an individual is secure under the shelter of drug abuse. Williams & Kelly (2005) illustrated in a research that A) teenagers have more secure attachment toward mothers and B) teenagers who have less interactions with their fathers and have insecure attachment have more behavioral problems. Also, Bahr & et al. (1998) in a study titled " Family, Religiosity, and the danger of drug abuse among teenagers" showed that there is a significant relation between attachment to father, attachment to mother, parents supervision, family aggression, drug problems in family and Religiosity with drug abuse and depression. The findings of Mohammadzadeh & et al. (1391) and Jazayeri & Dehghani (2003) illustrated that dependency to narcotic drugs has a direct link with attachment styles (avoidable and anxiety) and a reverse relation with secure attachment style, and predicted it. Nickerson & Nagle (2005) also reported that attachment styles have an important role in psychological adaptation (decrease of anxiety) and probably avoidance of entrance of people to addiction and narcotic drugs. The findings of Kassel, Wardle & Roberts (2007) also emphasized on the potential importance of attachment styles as a dangerous factor for drug abuse among university students.

The character dimension (extrovert-introvert) is also effective on predicting of preparation for addiction. Based on Eysenck's theory, extroverts are those who are excited slowly and weakly while avoidance occurs quickly and strongly which its effect is spread quickly and removed (Carducci, 1998). Extroversion is a tendency to be interested and respond to external objects and participation into social activities (Fortunato & Furey, 2009). Extroversion include the characteristics of socializing, activity, certainty, and courage (Joshanlou & Rastegar, 1385). While one of the

prominent features of introverts is curiosity, and these people are more interested in research (Haghshenas, 1384).There was found a significant relation in the previous research between extroversion-introversion and tendency to narcotic drugs (Danesh & Azadi, 1385; Zargar & Ghaffari, 2009). Also, it was demonstrated in a research that healthy women have higher level of extroversion comparing with addicted women (Vazhir & Hadi, 1385). But Esfandyari Nik (1383) did not report any relation between characteristic features (extroversion-introversion) with beliefs related to drugs.

Assertiveness include the ability of an individual for self-defense and the ability to say "No" to what one does not want to do (Adam Rita, 2010). Various researches showed that there is a relation between the lack of social skills and outbreak of behavioral disorders in future. These problems which are related with weak social performance of individual include Delinquency, school and cognitive performance, skipping school and alcoholism, anti-social behavior and mental disorders (Sabety & Shahani, 1377). In a research done by Zargar & et al. (1387) among the staff of one industrial company in Ahvaz , there was not any significant relation between assertiveness and preparation for passive addiction but the findings of other researches indicate the improvement of predicting of tendency toward addiction by assertiveness (Hajihasani & et al,1391; Jafari & Shahidi, 2009).

According to the above, it can be deduced that addiction cannot be eradicated completely as a social harm but controlled by Wisdom, thought and effort. Since youth caught in the trap of drug addiction are existed from production cycle as makers of today and tomorrow society, they impose a heavy burden on the shoulder of government and people. Thus, the importance of the studies of the features predicting drug addiction is more obvious. Thus, the purpose of this research is the analysis of the relation of attachment styles, characteristic dimensions and assertiveness with tendency to narcotic drug abuse among students of universities.

METHODOLOGY

Population, sample, and sampling method

The statistical population of this research is all the university students (Girls and boys) of Islamic Azad universities of west of Mazandaran in two branches of psychology and art and architecture in different level in the volume of 2420 people in the first educational semester of 91-92 .237 people were selected from Islamic Azad universities of Tonekabon and Ramsar by the use of Cochran's formula of determining the sample volume.The sampling method of this research is assessable.

Tools

Revised adult attachment scale RAAS: Attachment scale was first provided by Collins and Reid in 1990 and revised in 1996. The theoretical bases of this test are attachment theory. The adults attachment scale which explores the assessment of individual of communication skills and his intimate relation style include 18 statements which the respondents express their agreement or disagreement with each of these statements in Likert's scale of 5 degrees. This questioner has three sub-scales: (dependency, closeness and anxiety) which 6 statements were specified for each of sub-scales. The sub-scale of closeness of 6 include: 1,8,9,10,14,17; sub-scale of dependency include: 3,4,7,15,16,18 and sub-scale of anxiety include: 2,5,6,11,12,13 which for statements of 2-3-4-9-10-16-17-18 scoring is reverse. The reliability value of these tests is reported for each of the three sub-scales of independency, closeness and anxiety as 0.68, 0.71, and 0.52, respectively. The reliability was also performed by the use of testing method- retesting as a correlation between two performances on a sample by the volume of 100 people in Iran. The results of double testing of this questioner with intervals of one month indicate that the differences between two performances were not significant, and this test is reliable at the level of 95% (Hamidi, 2007).

Eysenck personality Questionnaire (Adult): this test includes 90 questions which for each there are two options of yes or no. For some cases, the Yes option has 1 score and No option zero score while in other cases Yes is scores zero and No is scored 1. Also ,this questioner test other factors such as Psychoticism P, Neuroticism N, Extroversion E, and lying L. Eysenck tested it on a single group in two different time for determining its reliability and validity, and he could attain its reliability and validity. The coefficient of internal reliability (Cronbach's alpha) was P=0.78, E=0.90, N=0.88, and L=0.82 for men and for women, P=0.76, E=0.85, N=0.85, and L=0.79. Also, by testing method- retesting for double execution of this questioner on one sample of 230 people, the correlation coefficient was reports as follow: For men P=0.77,E=0.83,N=0.76,and L=0.76 and for women P= 0.81,E=0.89,N=0.81,and L=0.80 (Fathi Ashtyani, 1388).

Gambril & Richey's Assertiveness Questionnaire (1975): This questioner has 40 articles .Since some of these articles are not adapted with Iranian culture, the form with 21 and 22 articles are used (the form with 22 articles was used in this research).The results of this questioner are from 22 to 110. The cutting point of this questioner is 55. Those who acquired fewer than 55 are recognized as people with low courage. This questioner is a scale of 5 degrees which the respond of each of the articles is from 1 to 5. The total score of the respondent is considered as assertion of his courage. The achieved reliability rate of this questioner was reported 0.88 by Gambril and Richey (1975). Its validity is approved by experts (Bahrami, 1375).

Addiction Potential Scale: Addiction Potential Scale was made by Weed & Butcher (1992) .some attempts have been done in Iran for its validity. This questioner is an Iranian scale of addiction potential which was made by Zargar (1385) based in the psycho-social condition of Iranian society. This questioner is made of two factors and it has 5 articles of lie detectors. (The questions of active factor: 2, 3, 4, 5, 7, 8, 9, 10, 11, 16, 17, 18, 19, 22, 24, 25, 26, 27, 28, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41; The questions of passive factor; 1, 2, 9, 13, 14, 20, 23, 32, 35; The questions of lie detection: 6, 12, 15, 21 and 33). The scoring of each question is on a continuum of zero (totally disagree) to 3 (totally agree). Measuring the validity of this method, two methods were used. In criterion validity, the questioner of addiction potential differentiated two groups of addicted and non-addicted well. The Validity the structure of the scale was measures 0.45 by correlation with the scale of 25-points of the list of symptoms which is significant. The reliability of the scale was assessed 90% by Cronbach's alpha method which is suitable (Zargar & et al., 1387).

Research Method: Since this research studied the "relations between attachment styles, personality dimensions, and assertiveness with extend of tendency toward narcotic drugs among the students of Islamic Azad university of west of Mazandaran", the statistical model of multi variable and single variable regression and correlation matrix (for analyzing the relation between the research variables with each other) were employed.

RESULTS

Table1: Multi-variable regression for predicting of "the passive factor of tendency toward addiction" by small scales of "attachment styles"

According to the above table and by emphasize on the achieved F, it can be said that there is a significant relation between "the passive factor of tendency toward addiction" with "attachment styles" at the level of α=0/01 .In another word, there is potentiality to predict "the passive factor of tendency toward addiction" by "attachment styles". Thus, it is crucial to introduce the table of regression square for identifying and determining regression squares.

According to multi-variable regression squares with simultaneous entry and also the achieved regression square, it can be stated that there is a significant relation between the sub-scales of "attachment", and "anxiety" with "the passive factor of tendency to addiction". Thus, Increasing of " attachment" and " anxiety" raises " the passive factor of tendency to addiction", and by its decrease ," the passive factor of tendency toward addiction" declines. There is a negative significant relation between the sub-scales of "closeness" with "passive factor of tendency toward

addiction". Therefore, increasing "closeness' makes "the passive factor of tendency to addiction" decreases and by its decline "the passive factor of tendency toward addiction" increases.

According to the above table and by emphasize on the amount of achieved F, it can be stated that there is a significant relation between "the passive factor of tendency toward addiction" with "assertiveness" at the level of α=0/01. In another word, there is a possibility of predicting "the passive factor of tendency toward addiction" by the use of "assertiveness". Thus, it is crucial to offer the table of regression squares for identifying and determining the regression squares.

According to single variable regression square by simultaneous entry and the achieved regression squares, it can be stated that there is a negative significant relation between "assertiveness" with "the passive factor of tendency toward addiction". Thus, increasing "assertiveness" leads to decrease of "the passive factor of tendency toward addiction", and by the decline of it, "assertiveness" raises.

According to the above table and by emphasize on the amount of achieved Fit can stated that there is a significant relation between Eysenck Personality Factors with " Eysenck Personality Factors" at the level of α=0/01. In another word, there is a possibility of predicting " the passive factor of tendency toward addiction" by Eysenck Personality Factors. Thus, the table of regression squares is needed to identify and determine the regression squares.

According to single variable regression square by simultaneous entry and the achieved regression squares, it can be stated that there is a positive significant relation between "Neuroticism" and "Psychoticism" with "the passive factor of tendency toward addiction". Thus, increasing "Psychoticism" and 'Neuroticism" factors lead to increase of "the passive factor of tendency toward addiction", and by the decline of it, "the passive factor of tendency toward addiction "decreases. There is also a negative significant relation between "extroversion" and "the passive factor of tendency toward addiction". Thus, by increasing "extroversion", "the passive factor of tendency toward addiction" decreases and by the decline of it, "the passive factor of tendency toward addiction" increases.

According to the above table and by emphasis on the amount of achieved F, it can be stated that there is a significant relation between " the active factor of tendency toward addiction" with " attachment styles" at the level of α=0.01.In another word, there is potentiality of predicting " the active factor of tendency toward addiction" by " attachment styles". Thus, it is essential to have the table of regression square for identifying and determining the regression squares.

According to the multi-variable regression by simultaneous entry method and the achieved regression squares, it can be stated that there is a significant positive relation between the sub-scales of "attachment" with "the active factor of tendency toward addiction". In a way that, by increasing "attachment", "the active factor of tendency toward addiction" also increases and by its decline, "the active factor of tendency toward addiction" decreases.

According to the above table and by emphasis on the amount of achieved F, it can be stated that there is a significant relation between "the active factor of tendency toward addiction" with "assertiveness" at the level of α=0.05. In another word, there is potentiality of predicting "the active factor of tendency toward addiction" by "assertiveness". Thus, it is essential to have the table of regression square for identifying and determining the regression squares.

According to the multi-variable regression by simultaneous entry method and the achieved regression squares, it can be stated that there is a significant negative relation between the sub-scales of "assertiveness" with "the active factor of tendency toward addiction". In a way that, by increasing "assertiveness", "the active factor of tendency toward addiction" decreases and by its decline, "the active factor of tendency toward addiction" increases.

According to the above table and by emphasis on the amount of achieved F, it can be stated that there is a significant relation between "the active factor of tendency toward addiction" with "Eysenck Personality Factors" at the level of α=0.01.In another word, there is potentiality of predicting "the active factor of tendency toward addiction" by "Eysenck Personality Factors". Thus, it is essential to have the table of regression square for identifying and determining the regression squares.

According to the multi-variable regression by simultaneous entry method and the achieved regression squares, it can be stated that there is a significant positive relation between the factors of "Psychoticism" and "Neuroticism" with "the active factor of tendency toward addiction". In a way that, by increasing of factors of "psychoticism" and "neuroticism", "the active factor of tendency toward addiction" increases and by its decline, "the active factor of tendency toward addiction" decreases. There is a significant negative relation between "extroversion" factor and "the active factor of tendency toward addiction". Thus, increasing "extroversion" decreases "the active factor of tendency toward addiction" and by its decline, "the active factor of tendency toward addiction" increases.

According to the above table and by emphasis on the amount of achieved F, it can be stated that there is a significant relation between "the passive factor of tendency toward addiction" with "Eysenck Personality Factors" at the level of α=0.01. In another word, there is potentiality of predicting "the passive factor of tendency toward addiction" by sub-scales of "attachment styles"," assertiveness, and "Eysenck Personality Factors". Thus, it is essential to have the table of regression square for identifying and determining the regression squares.

According to the multi-variable regression by simultaneous entry method and the achieved regression squares, it can be stated that there is a significant positive relation between "anxiety" and "Neuroticism" with "the passive factor of tendency toward addiction". In a way that, by increasing of "anxiety" and "neuroticism", "the passive factor of tendency toward addiction" increases and by its decline, "the passive factor of tendency toward addiction" decreases."

According to the above table and by emphasis on the amount of achieved F, it can be stated that there is a significant relation between "the active factor of tendency toward addiction" with "Eysenck Personality Factors" at the level of α=0.01. In another word, there is potentiality of predicting "the active factor of tendency toward addiction" by sub-scales of "attachment styles"," assertiveness, and "Eysenck Personality Factors". Thus, it is essential to have the table of regression square for identifying and determining the regression squares.

According to the multi-variable regression by simultaneous entry method and the achieved regression squares, it can be stated that there is a significant positive relation between "anxiety" and "Neuroticism" with "the active factor of tendency toward addiction". In a way that, by increasing of "anxiety" and "neuroticism", "the active factor of tendency toward addiction" increases and by its decline, "the active factor of tendency toward addiction" decreases."

There is a significant negative relation between "lie" with "the active factor of tendency toward addiction". In a way that, by increasing of "lie" ", "the active factor of tendency toward addiction" decreases and by its decline, "the active factor of tendency toward addiction" increases."

DISCUSSION AND CONCLUSION

This study was conducted by the purpose of analyzing the relation between attachment styles, personality dimensions, and assertiveness with tendency toward narcotic drugs among all the students of Islamic Azad university of west of Mazandaran in two majors of psychology, art and architecture. According to the findings of this research, the results are as follow:

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Analyzing the predicting of tendency toward drugs by the variables of attachment styles, the secure attachment style has a reverse relation and insecure ambivalent avoidable attachment style has a positive and direct relation with tendency toward drugs. This finding is in parallel with the findings of Kassel, Wardle & Roberts (2007); Nickerson & Nagle (2005); and Mohammadzadeh & et al. (1391). These researchers have illustrated in their research that the secure attachment style is a protective factor against tendency toward drugs. In terms of determining the results, it can be stated that Inattention and lack of care in childhood and adolescence, loneliness and sadness, hostility and incapability to communicate, emotional deprivation in childhood, lack of support to cover one's treatment and growth needs, lack of sympathy in stressful issues, numerous criticism and tremendous expectation out of the capability of individual, low trust ,and the huge gap between parents and children are all the motivators for drug addiction. The effect of narcotic drugs leads individual to this discover this fact that he can influence his sadness and pain which is the result of his failure and unhappiness in a secure relation by the help of narcotic drugs and change his emotional state.

Analyzing the prediction of tendency toward drugs by the variables of personality dimensions, a significant reverse relation with extroversion was shown ,and a direct significant relation between the factor of introversion with the tendency to drugs was demonstrated which are in parallel with the findings of Danesh & Azadi (1385); Vazhir & Hadi (1385) and Zargar & Ghaffari (2009). They have asserted in their studies that healthy people have higher level of introversion comparing with the addicted people. Also, Those are not satisfied with their emotions in social relations such as introvert people are more probable to be addicted but the finding of this research is inconsistent with reports of Esfandyari Nik (1383) which stated the irrelevancy of beliefs related to drugs and the personality criteria of extroversion-introversion. Determining the findings of this research, it can be stated that extroverts prevent and avoid the addition of problems and their protection due to their personality feature. In contrary, introverts are attracted to drug abuse to escape from this problem.

Studying the prediction of tendency to drugs by the variable of assertiveness, there was found a reverse relation between assertiveness and tendency to drugs. According to the findings, those are stronger in being assertive are less in danger of being addicted. This finding is consistent with the findings of the researches of Sabeti and Shahani (1377); Hajhasani & et al. (2009), and part of the findings of Zargar & et al. (1387) about the prediction of tendency toward active factor of addiction by assertiveness. Determining this finding about the relation between assertiveness and tendency toward addiction, it can be stated that the people who are less assertive have weaker self-esteem and self-confidence. So, they are not able to reject the irrational requests of others, and they try to assimilate with their own friends to strengthen their weak self-confidence to be approved by them and not be rejected more. Alexander adaptation model can also be used to determine the recent findings. According to this model, Incontinence against drugs is an attempt to deal with the failure of solidarity that means a failure to achieving different sorts of social improvements, competence, self-confidence, and personal independency which are the least expectations of people and society. According to Alexander, the person who is successful in coordination with others and social structure and have more self-confidence is less in danger of drug abuse. In addition, the multi-variable regression analysis which was shown in table 8 indicates that all three variables of attachment styles, personality dimensions of introversion-extroversion, and assertiveness have the capability of predicting the tendency toward drugs, and none of these predictable variables is deleted from regression models.

According to the consequences of addiction to drugs such as change of life style, inattention to physical and mental health, avoidance of main activities of life, decrease of social relation and family problems, financial problems resulted from drug supply and considering the importance of social and inter-personal skills in the mental and physical health of university students as productive groups of society, it is essential that drug addiction is considered more. one of the limitations of this research was selection of the volume of available sample .Since multiple factors involve in tendency and abuse of drugs, it is suggested that other factors such as depression, social class, the residency of subjects during education, and study field will be considered in future researches to have more accurate judgment for predicting of tendency toward narcotic drugs.

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Table1: Multi-variable regression for predicting of "the passive factor of tendency toward addiction" by small scales of "attachment styles"

Significance level	Amount of F	Mean square	Degree of freedom	Total squares	Source of changes
0/001	28/44	535/59	3	1606/77	Regression
		18/83	220	4143/23	remainder

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The regression squares related to table 1

Significance level	Amount of	Beta square	Predictable	Variable criteria
0/062	-1/88	-0/11	closeness	Passive factor of tendency toward addiction
0/001	-3/31	0/20	attachment	
0/001	7/81	0/45	anxiety	

Table 2: single variable regression for predicting of "the passive factor of tendency toward addiction" by "assertiveness"

Significance level	Amount of F	Mean of squares	Degree of freedom	Total squares	Source of changes
0/001	18/92	437/40	1	437/40	Remained regression
		23/12	223	5154/76	

Regression square related to table 2

Significance level	Amount of T	Beta Square	Predictable variables	Variable criteria
0/001	-4/35	-0/28	assertiveness	" the passive factor of tendency toward addiction"

Table 3: multi-variable regression for predicting "the passive factor of tendency toward addiction" by" Eysenck Personality Factors"

Significance level	Amount of F	Mean square	Degree of freedom	Total squares	Source of changes
0/001	50/87	684/40	4	2737/59	The remained regression
		13/45	208	2798/11	

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Regression squares related to Table 3

Significance level	Amount of T	Beta square	Predictable variables	Variable criteria
0/011	2/56	0/14	Psychoticism	" the passive factor of tendency toward addiction"
0/001	11/79	0/62	Neuroticism	
0/019	-2/36	0/12	extroversion	
0/239	0/98	0/05	Lie (L)	

Table 4: Multi-variable regression for predicting "the active factor of tendency toward addiction" by sub-scales of "attachment styles'

Significance level	Amount of F	Mean square	Degree of freedom	Total squares	Source of changes
0/001	9/97	1341/22	3	4023/65	Remained regression
		134/55	216	29063/24	

Regression squares related to table 4

Significance level	Amount of T	Beta squares	Predictable variables	Variable criteria
0/56	-0/58	-0/04	closeness	" the active factor of tendency toward addiction"
0/46	-0/73	-0/05	attachment	
0/001	5/28	0/34	anxiety	

Table5: single-variable regression for predicting "the active factor of tendency toward addiction" by "assertiveness"

Significance level	Amount of F	Mean squares	Degree of freedom	Total squares	Source of changes
0/022	5/36	888/74	1	888/74	Remained regression
		165/74	219	36296/65	

Regression squares related to table 5

Significance level	Amount of T	Beta squares	Predictable variables	Variable criteria
0/022	-2/32	-0/15	assertiveness	" the active factor of tendency toward addiction"

Table6: multi-variables regression for predicting "the active factor of tendency toward addiction" by Eysenck Personality Factors

Significance level	Amount of F	Mean square	Degree of freedom	Total squares	Source of changes
0/001	28/39	3209/02	4	12836/08	Remained regression
		113/01	206	23281/07	

Regression squares related to table 6

Significance level	Amount of T	Beta squares	Predictable variables	Variable criteria
0/001	6/64	0/42	Psychoticism	" the active factor of tendency toward addiction"
0/014	0/15	0/15	Neuroticism	
0/150	-0/08	-0/08	Extroversion	
0/001	-0/19	-0/19	Lie(L)	

Table7: multi-varibales regression for predicting "the active factor of tendency toward addiction" by sub-scales of "attachment styles', "assertiveness, and "Eysenck Personality Factors".

Significance level	Amount of F	Mean square	Degree of freedom	Total squares	Source of changes
0/001	26/71	331/08	8	2648/65	Remained regression
		12/40	194	2404/98	

Regression squares related to table 7

Significance level	Amount of T	Beta square	Predictable variables	scales		Variable criteria
0/46	-0/72	-0/04	closeness	Attachment styles		passive factor of tendency toward addiction
0/113	-1/59	-0/09	attachment			
0/002	3/16	0/18	Anxiety			
0/514	-0/65	0/10	assertiveness	-		
0/076	1/78	0/51	Psychoticism	Eysenck Personality		
0/001	8/40	-0/09	Neuroticism			
0/090	-1/71	0/03	Extroversion			
0/611	0/51	-0/03	Lie (L)			

Table 8: multi-variables regression for predicting "the active factor of tendency toward addiction" by sub-scales of "attachment styles'," assertiveness, and "Eysenck Personality Factors"

Significance level	Amount of F	Mean square	Degree of Freedom	Total squares	Source of changes
0/001	14/39	1492/03	8	11936/27	Remained regression
		103/70	192	19911/43	

Regression squares related to table 8

Significance level	Amount of T	Beta squares	Predictable variables	scale		Variable criteria
0/708	0/37	0/02	closeness	Attachment styles		Active factor of tendency toward addiction
0/636	0/47	0/03	attachment			
0/003	3/03	0/20	anxiety			
0/978	-0/03	-0/002	assertiveness	-		
0/001	5/76	0/38	Psychoticism	Eysenck Personality		
0/271	1/10	0/07	Neuroticis			
0/098	-1/66	-0/10	extroversion			
0/001	-3/29	-0/20	lie			

RESEARCH ARTICLE

Life Cycle Assessment of Bioethanol Production from Date Waste

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ABSTRACT

A cradle-to-grave study was conducted to evaluate life cycle energy and environmental effects of ethanol produced from Date waste in Iran. Simapro software was applied to evaluate the life cycle environmental impacts of producing Date waste based ethanol. The energy used to produce one liter ethanol, energy ratio and net energy value was found to be 28.8 MJ, 0.74 and -7.6 MJ respectively. In general electricity energy with 37.91% had maximum share of whole energy inputs in ethanol production from Date waste whole sequences. In subsections so in horticultural section and Date syrup production stage, electricity had maximum share of whole energy inputs with 1.67 and 33.58 percent respectively. Also electricity had the highest negative loads to the environment between whole inputs. Thus it should to produce solutions in generation, transmission and distribution of electricity in Iran. Date syrup production segment and agricultural section has the highest share of consumed energy and environmental loads respectively. Studies on the production of ethanol from Date waste is in the range of waste management. Therefore, in these case even if there was not a suitable energy or environmental indices, continuing the generation of this product is justifiable according to other side issues including environmental benefits and employment problem elimination.

Key words: Date, Date syrup, Bioethanol, Renewability, Greenhouse gasses, Environmental impacts, LCA.

INTRODUCTION

Global emissions and then environmental pollution from fossil fuels have significantly increased since 1900. Between 1900- 2008 the global emissions was increased more than 16 times and so between 1990-2008 it was increased about 1.5 times (US EPA, 2013). This environmental pollution issues based on the increasing of crude oil price, energy security and limited fossil fuels resources, caused the replacement of these environmentally harmful impacts and unsustainable fossil fuels by renewable and sustainable alternatives become a necessary problem (Jung, et al., 2012, Dragone et al., 2010). Bioethanol is a renewable energy resource that can be helpful to reduce emissions and environmental pollutions; however the amount of current bioethanol production is an obstacle (Morales et al., 2013; Philippsen, 2010). Corn, sugarcane, date and etc. are the resources of the currently bioethanol production that is so called "first generation fuels" and these resources can compete with human foods in using arable lands, water, fertilizer and other resources and may have negative affect on economic and food price (Bringezu et al., 2007; Philippsen, 2010). Therefore attentions changed to produce bioethanol with by-products and wastes of these products.

The energy efficiency is an index that should be determined and quantify, thus quantifying the overall energy efficiency of a biofuel is helpful to determine how much fossil energy must be expended to convert the energy available in the raw materials. If the less fossil energy was required to produce the biofuel, we can call this biofuel renewable and if more fossil energy was required we can call it nonrenewable. Thus, the renewability character of a fuel can vary across the spectrum of completely renewable; if no fossil energy input was required, to nonrenewable; if fossil energy inputs as much as or more than the energy output of the fuel (energy production) (Sheehan et al., 1998). In theory, a completely renewable fuel would have no requirements of fossil energy and thus, its fossil energy ratio would be infinite.

Some of the researchers were evaluated the economic and environmental impacts of biofuels and most of them were life cycle assessment (LCA) that is conducted with idiom of cradle to grave evaluation of biofuels (Hill, et al., 2006; Kim and Dale, 2005; Puppan, 2002). These evaluations were determined the advantages and disadvantages of this biofuels than each other and so other fossil fuels. According to these studies, the environmental impacts of different biofuel production were various, since different production methods were applied for production of several biofuels. Also the carbon emission in whole life cycle of biofuel production was found less than fossil fuels in many studies, but finally stated that pollution of water resources due to fertilizers transmission in it and the water resources depletion may be occurred in biofuel production (Farrell et al., 2006; Hill, et al., 2006; Puppan, 2002). Pradhan in 2010 have studied on life cycle assessment of soybean and calculated the Fossil Energy Ratio (FER) index equal to 4.56 and CO_2 emission in soybean production was found 84.44 in this study. Also Nguyen et al. in 2008, have calculated negative Net Energy Value (NEV) in full chain life cycle energy assessment study of Sugarcane molasses based ethanol production, but they proposed that it will be justifiable if byproduct energy such as distillation wastage have been used instead of fossil fuels. Pieragostini et al. (2014) have evaluated ethanol production life cycle from Corn in Argentina with Simapro software, in this study notwithstanding assumed that no-tillage system was used in agricultural segment, but corn production stage have had high environmental impacts in whole sequences.

The goal of this study is to assess energy and environmental performance of bioethanol production from date waste based on a life-cycle approach.

METHODOLOGY

The life-cycle inventory analysis was performed on the material and energy inputs and air emission, involved in the life cycle of bioethanol production from date waste, based on 100 liter bioethanol. Data for horticulture practices of date production include (pollination, irrigation, labor, diesel fuel usage, manure, fertilizer and pesticide usage and

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date harvesting) were collected from the orchardists by using a face-to-face questionnaire. For industrial stages of ethanol production (date syrup production and then ethanol production from date syrup), Data were collected from syrup production industrial of Mehregan Khormaye Asia and from ethanol production industrial of Jahan Khorma located in Iran. This study was conducted in Bushehr province that is located in the west south of Iran, within 27° 16' and 30° 18' north latitude and 50° 6' and 52° 56' east longitude.

Goal and scope definition

The goal of this study is to assess the energy and environmental performance of biodiesel production from date waste based on a life-cycle approach.

The system boundary is shown in figure 1.

Life-cycle inventory analysis

The data on energy consumption, utilities, and wastes generated within the system boundary mostly obtained by estimating their value and were collected from literatures, calculation, and databases. Table 1 illustrates the information related to materials and energy uses for producing ethanol from date waste.

Basic information included electricity, diesel fuel, natural gas, chemical fertilizers, pesticides, manure and human labor. Chemical fertilizer included nitrogen, phosphate and potassium fertilizer and so pesticide included roundup, Gramaxone, diazinon, malathion, deltamethrin, tetradifon and carbaryl. For date syrup production inputs include of date, natural gas and electricity, and so inputs for ethanol production were include of date syrup, diesel fuel and electricity.

By-products allocation

Economic allocation was performed for by-products using average market prices of products and co-products and their weight (Rozakis, et al., 2001).

In the economic value method of allocation for products and by-products, the biofuel ultimately must cause a profit to be subsistence. In this method we must share input energy between main product and co-products based on their economic value and their weight produced as shown in equation 2.

Equation 2.
$$PE_E = \frac{PM}{\sum_{i=o}^{n} P_i M_i} \times 100$$

Energy flow full chain

Full chain of energy in ethanol production from date waste include of energy used to date pollination, irrigation, pesticide spray, fertilizer and manure distribution, pruning, harvesting, sorting and then in industrial segment, fermentation in date syrup production and distillation in ethanol production from date syrup was calculated and illustrated in table 2.

Energy data was include of diesel fuel, irrigation (electricity and implements), chemical fertilizers, manure, pesticide and labor in date production segment, natural gas and electricity in date syrup production segment and diesel fuel and electricity in ethanol production from date syrup segment.

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Environmental Impact Assessment

The environmental impacts of date production from pollination to date harvest are shown in figure 2. As illustrated in this figure pesticide, electricity, P_2O_5 and urea among whole inputs with 60, 30.1, 2.2 and 1.8 percentages have maximum environmental impacts in date production respectively. Because of low energy inputs in date production life cycle, thus there were not justifiable environmental impacts of energy inputs in this production.

Figure 3, illustrated the environmental impacts of date syrup production, as shown in this picture, environmental impacts in date production with 71.2% has the maximum environmental impact of whole inputs in this stage and electricity and natural gas with 16.5% and 12.3% were in subsequent ranking respectively.

The environmental impacts of ethanol production from date syrup are shown in figure 4. In this stage, date syrup with 79% has maximum environmental impact of whole inputs in this stage, after that so electricity and diesel fuel with 16.5% and 12.3% were in subsequent ranking respectively.

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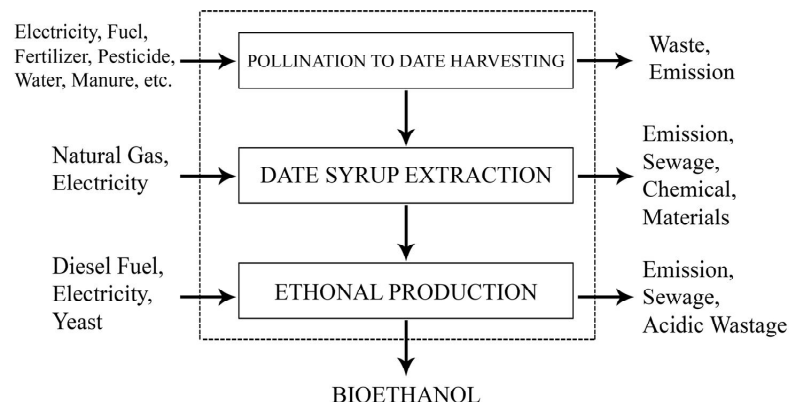
Fig.1. Product system boundary of this study
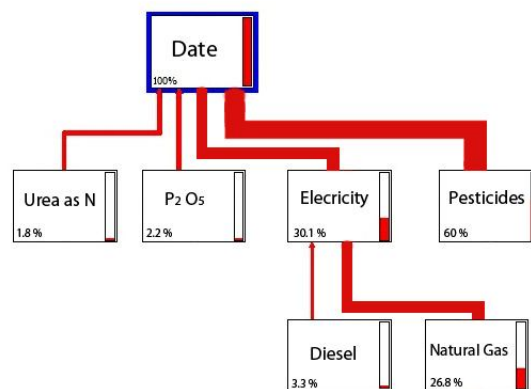
Figure 2. Environmental impacts of date production

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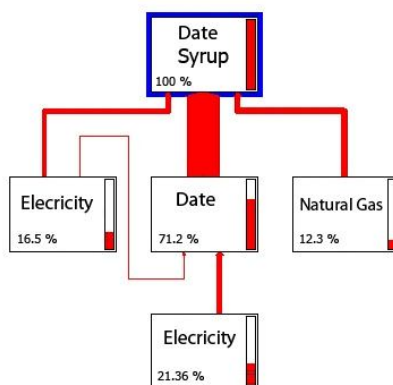
Figure 3. Environmental impacts of date syrup production
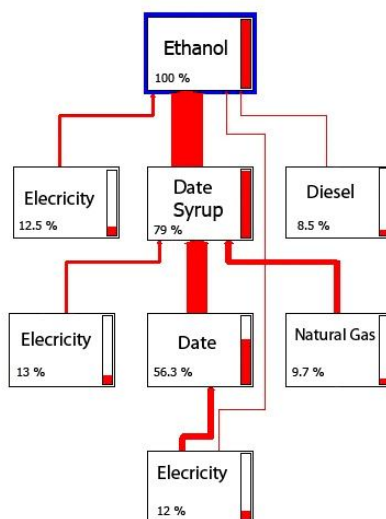
Figure 4. Environmental impacts of ethanol production from date syrup

Table 1. Energy equivalent of inputs in ethanol production from Date waste			
Inputs	**unit**	**Energy equivalent (MJ unit^{-1})**	**Reference**
Labor	MJ h^{-1}	2.2	(Pimentel and Pimentel, 1979)
Diesel fuel	MJ L^{-1}	47.8	(Kitani, 1999)
Natural Gas	MJ L^{-1}	49.5	(Kitani, 1999)
Chemical fertilizer			
Nitrogen (N)	MJ kg^{-1}	78.23	(Gellings and Parmenter, 2004)

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Phosphorus (P$_2$O$_5$)	MJ kg^{-1}	17.5	(Helsel, 1992; Gellings and Parmenter, 2004)
Potassium (K$_2$O)	MJ kg^{-1}	13.8	(Gellings and Parmenter, 2004)
Manure	MJ kg^{-1}	0.3	(Esengun et al, 2007)
Pesticide	MJ kg^{-1}	85.5	(Kitani, 1999)
Electricity	MJ kw-hr^{-1}	15.28	(Kitani, 1999)

Table 2. Inputs energy from date pollination to ethanol production (100 liter)

Activities	Inputs	Energy (MJ)	Percentage
Date production	Diesel fuel	16.4	0.57
	Irrigation (Electricity)	48	1.67
	Irrigation (Implements)	2.2	0.07
	Chemical fertilizers	48	1.67
	Manure	5	0.17
	Labor	12	0.42
	Pesticide	20	0.69
	Total	151.6	5.26
Date syrup production	Natural Gas	878.42	30.5
	Electricity	970	33.58
	Total	1848.42	64.18
Ethanol production	Diesel Fuel	806.4	28
	Electricity	73.6	2.56
	Total	880	30.56
Total		2880	100

Table 3. Energy inputs, outputs, NER and NEV in ethanol production (1 liter)

Energy inputs (MJ)	Energy outputs (MJ)	NER (%)	NEV (MJ)	ERE
28.80	21.2	0.74	- 7.6	- 0.36

RESEARCH ARTICLE

Comparison of Effectiveness of Cognitive-Behavioral Therapy (CBT) and Group Cognitive-Behavioral Therapy for Anxiety and Depression of Students

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ABSTRACT

The present research has been conducted aiming at comparing effectiveness of cognitive-behavioral therapy (CBT) and group cognitive-behavioral therapy for anxiety and depression of students. The quasi-experimental method has been used as the research method, such that effects of the therapies under study in depression and anxiety of studies have been examined via two experimental and control groups. Sample group(45) has been selected among Tehran university via purposive sampling method. The sample group was divided into three groups via the results of pre-test. The data obtained from these three groups were analyzed via software SPSS and analysis of variance (ANOVA). The results indicated that two types of therapy affected reduction of anxiety and depression of students, however, effect of group cognitive-behavioral therapy has been more.

Key words- social anxiety, cognitive-behavioral therapy (CBT), group cognitive-behavioral therapy

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INTRODUCTION

Disability in assertiveness which is followed by shyness, isolation, aggression, lack of behavioral maturity and anxiety is one of the major problems of individuals especially adolescents. All of these issues can have substantial effect on social adjustment. Any isolation can have different reasons including not having sufficient opportunity for practicing personal skills, failure to observe suitable pattern, sense of   transgression and learning unsuitable behaviors. The barriers which avoid learning social skills result in reduction of self-esteem among adolescents. The scientists such as Adler, Rogers, Sullivan and Maslow have known shortage of self-esteem as the cause of many mental diseases. Hence, most of human problems associate to self-esteem. Toned (1991) believes that assertive person has self-confidence and positive feeling, thoughts and attitude towards himself and others, following honesty in his behavior with others. Some researchers have reported that these individuals are more successful in finding a suitable job and involving in it properly (boroks, nekerd, Ryslr, 2001). Anxiety and the areas affiliated to it have been mentioned as the most extensive research areas at the recent decades. However, authors have called the 20th century with age of anxiety, anxiety has existed at all the periods of human life. Anxiety does not refer to a new concept, discussed in works of ancient Egyptians (Beck, 1999). Freud (1934) believed in anxiety as the cost that the human pays for civilization. It seems that the human problems keep increased at this age which is called age of civilization. In contrast, Adler believed in anxiety as a cost that the human pays for incivility (Lang, 1994). Puklek (2008) mentioned that since issue of social anxiety among adolescents has been rarely examined by the researchers, this study enjoys a significant importance. For instance, some studies have indicated the most abundant type of anxiety at childhood and adulthood has a social nature. In this regards, the person's concern about acceptance or rejection by classmates, concern about support and loyalty of friends, concern about ridicule of friends and/or flustering in front of them are more prevailed(Palk, 2004). In addition, epidemiological studies have put an emphasis on increasing prevalence of social anxiety at the middle of adolescence period(Essau, 1999). Adolescents with high social anxiety have reported high depression symptoms such as negative mood, low self-esteem and poor function in relationship with peers(La Greca, 1998; Mallet, 1999). Isa et al put an emphasis on this point that about 10% of adolescents with social anxiety have received diagnosis of alcohol dependence or abuse. Without doubt, Palk and Vadis mentioned that findings of such studies enjoy a high clinical importance. Diagnosis of anxiety and its treatment among children and adolescents is very important, because their personality develops at this period. However social anxiety is diagnosed at the middle of childhood or adulthood, few studies have been conducted at the area of etiology, disorders and outcomes of social anxiety at the early childhood years. However some researchers have referred to the theoretical constructs associated to social anxiety at the year childhood years such as shyness and social isolation constructs (Kaplan, 2007; Trans-Rezaei, 2010). Social anxiety disorder differs from shyness, performance anxiety and distress due to more prevalence. The individuals affected by social anxiety might avoid important activities such as attendance in classes and conferences, yet they avoid active attendance. Most of researchers know social anxiety disorder associated to poor achievement at school, problems in relationships and poor socioeconomic situation. They acquire less achievement at school and job and they might less likely marry than the ones who are not affected by social anxiety. At the early care centers, social anxiety disorder causes poor performance and loss of job, yet still most of cases have not received treatment. In general, social anxiety serves as a barrier and does not allow setting social communications, because negative beliefs about oneself, shyness and embarrassment avoid setting communication (Kerozir, 2003). In addition, high levels of anxiety have negative effect on memory and ability of concentration (Engel et al. 2001). Furmark(2002)reported that social anxiety is followed by poor performance and academic decline, increase of the probability to escape from school, dissatisfaction with friends and attendance in recreational activities, low job and economic level, disability in finding job. During two recent decades, social anxiety disorder has been recognized as the most common chronic psychiatric disorder and anxiety disorder (Wilde, Clark, Ehlers, mac Manus , 2008), so that social anxiety is more likely witnessed among adolescents. Cognitive-behavioral therapy (CBT) based on acceptance-commitment therapy (ACT),exposure therapy and social skills training have been used to treat social anxiety(Zaider, 2003). In a research, treatment with phenelzine has been evaluated more effective than cognitive-behavioral therapy (CBT). Nevertheless, integration of the aforementioned methods with chemotherapy might result

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in improvement of effects of chemotherapy. Currently, most of researchers know the proposed treatment as cognitive-behavioral therapy (CBT) together with Selective serotonin reuptake inhibitors (SSRIs)(ER Dodds and Barrett , 2001; Ferdinand , Bart and ER Dodds , 2004). Traditional treatment of social anxiety disorder includes social skills training under this presumption that these individuals have abnormalities in their social skills. There has been doubt on this assumption under concept of recent constructs about the adults, referring to deep belief of individuals affected by social anxiety about problems and weakness in social skills (Cartwright et al. 2005). With regard to different elaborations which exist for this disorder, different therapy methods have been invented. In general, it can divide therapy methods into two general methods despite their fundamental differences: general therapy methods and Problem-Focused Therapy (Dadsetan, 2009).

The most important theory in social anxiety disorder has been represented in this way that the individuals affected by social skills deficiency to whom social skills training has been considered (Cartwright et al. 2009). Further, Clark (2005) has provided a general view of this cognitive-behavioral therapy (CBT) model. He put an emphasis on this point that how cognitive processes encompass situations of social fears and how cognitive processes stabilize this disorder. With regard to Clark's theory, the individuals affected by social fears have negative and unreal expectations from their performance at social situations and maintain negative beliefs about their performance. He mentioned that individuals with social fear interpret ambiguous social signs in a negative way and engage in rumination after passing that situation about their performance. Clark has elaborated physical and behavioral factors and effective situational components in social fear (Nilsen and his colleague, 2009).

Cognitive-behavioral therapy

Cognitive-behavioral therapy is an integration of cognitive and behavioral approaches that assist the patient to diagnose and modify the distracted patterns and inefficient behavior. A huge part of therapy is based on current approach, aiming at helping the patient to bring about favorable changes in his life. Hence, in this therapy, an emphasis is put on providing an opportunity for new adaptive leanings and changes at the space out of clinical area. The most important aims of Cognitive-behavioral therapy include enhancing the patient's motivation, training coping skills, bringing about change in attachments, enhancing control over painful emotions, improving inter-personal performance, enhancing social skills. Group Cognitive-behavioral therapy refers to Cognitive-behavioral therapy in group which is performed in a group consisting of 8 members of those affected by social anxiety disorder in a week during two hours. In group Cognitive-behavioral therapy, the cognitive reconstruction and exposure methods are integrated to treat social anxiety.

METHODOLOGY

This research is a quasi-experimental research, categorized as a pre-test-post-test on control group. The statistical population consists of all the students who referred to psychology clinic of Shahid Beheshti University during 2014 and asked for attendance in sessions of group cognitive-behavioral therapy. The present research aims to examine and compare extent of efficiency of cognitive-behavioral therapy and group cognitive-behavioral therapy on depressed students with social anxiety. Hence, the applied aim of research is to evaluate the proposed therapy methods and acquire the most suitable method in treatment and reduction of social anxiety of adolescents. Library and fields studies at Tehran University were used to collect information and the selected individuals were matched based on diagnostic criteria for social anxiety in terms of age, gender and social situation. These individuals were matched based on diagnostic criteria for social anxiety in DSM 111-R in terms of age, gender and social situation and were classified to two groups including treatment and quasi-treatment groups. In addition to descriptive indicators to analyze data, covariance analysis is used to test hypotheses. The data obtained from questionnaire were analyzed via software SPSS.

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Measurement tools

In the present research, the tools below have been used to collect the required information. These tools were used to measure and evaluate different aspects of social anxiety and depression among students, that the evidences indicate that these tools enjoy validity and reliability.

Cattell's Anxiety Questionnaire (CAQ)

Anxiety Scale of Arnold B. Cattell has been provided based on numerous studies, mentioned as the most effective tool which has been provided as a short questionnaire with forty items. Cattell's Anxiety Questionnaire (CAQ) has been regarded as a questionnaire which can be used without care regardless of this fact that the participant reminds an important part of the previous responses. This scale can be used in both genders after age group of 14 years old and most of cultures (quoted from Zahra Rahimi, 1998). In this research, Cattell's Anxiety Questionnaire (CAQ) was performed in pre-test in classroom groups and in post-test in experimental and control groups. The reliability coefficient obtained for Cattell's Anxiety Questionnaire (CAQ) via Cronbach's alpha by Zeinab Asadi (2004) has been reported equal to 83.0. The reliability coefficient obtained for Cattell's Anxiety Questionnaire (CAQ) via Cronbach's alpha by the researcher has been reported equal to 94.0. Cattell's Anxiety Questionnaire (CAQ) has been normalized by Mrs Dadsetan in 1989 and validity of Cattell's Anxiety Questionnaire (CAQ) has been confirmed. In addition, Cattell's Anxiety Questionnaire (CAQ) has been used as an authentic measurement tool in different theses that the professors have confirmed validity of this scale.

Beck Depression Inventory

Beck Depression Inventory (BDI) which consists of 21 questions was formulated for the first time in 1961 by Aaron Beck. Validity of this inventory was examined and proved in 1971, 1979, 1985 and 1986. This inventory consists of 21 articles and 94 questions that each of articles associates to a special symptom of depression. These articles have been selected based on clear expressions of behavior in depression, not mentioned as a cause for any assumption about etiology or mental process in depression. In this test, 4 to 6 sentences have been written in from of each of the considered articles which specify one of the symptoms of depression, indicating the moderate to severe aspect of depression. It should be noted that the participant must read sentences of each article meticulously and specify a sentence which indicates the highest current state of him with crossing a circle.

Implementation method

Individuals were undergone individual and group cognitive therapy during 12 weeks. At the first stage, patients were asked about their expectations from treatment and were asked to agree on the conditions for attendance in sessions, duration and exact time of holding sessions. Further, it was stated that physiological, cognitive and behavioral processes in human associate to each other and emotions enjoy physiological, cognitive and behavioral components, thus the individuals got familiar to simulative event of belief or thought and its emotional outcome. The individuals were helped to know their superficial beliefs during the weeks between sessions and record it in a three-columned structure that each column was considered for ABC component.

The third session consisted of theoretical discussion on role of cognition in two negative emotions including depression and anxiety. After recording several cases of ABC, training to recognize negative schemes or major beliefs via Vertical arrow method was started. Then, to acquire a general understanding of problem and the status of relationship between improper beliefs, the individuals were trained with the methods such as putting the beliefs in a category, developing a major checklist of beliefs and designing a recognition map. When the beliefs were organized, the individuals learned some methods to treat with beliefs including comparison of beliefs with objective realities, evaluation of each belief and experimental test. Aim of this program has been individuals' access to improper beliefs.

After this stage, different methods of change of beliefs were trained to the individuals, including building opposite belief, self-inhibition approach and cortical inhibition. Further, some assignments about the subject of research were proposed at each session and the clients engaged in their assignments in the gap between sessions. Post-test was completed after ending the educational sessions.

Findings of research
Descriptive characteristics of variables

Table 2 indicates that there is a little difference on scores of participants in experimental and control groups at pre test stages, yet the individuals under study acquired lower scores in experimental groups at post-test stage in variables of depression and anxiety.

With regard to the results of table, there is a significant difference on scores of anxiety between experimental and control group. With regard to Duncan test, it is specified that there is a significant difference on score of anxiety in two experimental groups

Further, it is specified that there is a significant difference between means between two experimental groups who received cognitive-behavioral therapy and group cognitive-behavioral therapy in enjoying extent of social anxiety.With regard to the results of table, there is a significant difference on scores of depression between experimental and control group. With regard to Duncan test, it is specified that there is a significant difference on score of depression in two experimental groups.

Further, it is specified that there is a significant difference between means between two experimental groups who received cognitive-behavioral therapy and group cognitive-behavioral therapy in enjoying extent of depression.

CONCLUSION AND SUGGESTIONS

As mentioned, the main purpose of this research has been comparison of effectiveness of cognitive-behavioral therapy (CBT) and group cognitive-behavioral therapy for anxiety and depression of students. In this regards, two experimental and control groups were studied. Using Cattell's Anxiety Questionnaire (CAQ) before and after treatments, rate of anxiety was measured. Further, using Beck Depression Inventory (BDI) before and after treatments, depression was measured. Results of research indicated that both treatments caused reduction of anxiety and depression in both experimental groups. Yet, results of improvement in group cognitive-behavioral therapy are more significant than results of cognitive-behavioral therapy.

These findings are consistent with the results of Lagir et al.(2003). These researchers have studies effect of cognitive-behavioral therapy on reduction of anxiety among 14-18 years old adolescents affected by generalized anxiety disorder. Results of research indicated that cognitive-behavioral therapy causes reduction of anxiety and control over worrying thoughts, which the follow-up sessions during 6-12 months will result in reduction of anxiety. Biedermann(1990) in a research indicated that treatment of anxiety among adolescents must be multifaceted. Psychotherapy and psychosocial interventions are beneficial together with medication. In this regards, Bogels and his colleague (2006) announced the overlapping between anxiety of parents, children and adolescents in a family about 80%. They showed in a research that cognitive-behavioral therapy can reduce anxiety of parents and adolescents in a family. Treatment sessions had been planned in a way that the family members had relationship with each others. Coping with negative thoughts and using reward to control anxiety of children and adolescents have been mentioned as the most important aims of cognitive-behavioral therapy. Numerous studies have been conducted at the area of anxiety of girl and boy students in Iran, e.g. Bagheri(1996) measured anxiety of 205 students at age group 14-17 years old via Cattell's Anxiety Questionnaire (CAQ). Results of this research indicated that mean of generalized anxiety disorder is more among girl students than boy students. Further, Banizade(1997) in a research indicated that

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anxiety is more among the girl high school students than boys. The present research is consistent with the research by Behrouzi (1998) and Imamgholivand(1998) who examined effectiveness of cognitive-behavioral therapy in reduction of anxiety among girl students. Further, Norzendeh jani(1994) in a research studied cognitive-behavioral therapy compared to drug therapy among those ones affected by generalized anxiety disorder. Results of research indicated that cognitive-behavioral therapy can significantly decrease anxiety. Horami and Rezvan(2007) in a research examined the relationship between worrying thoughts and meta-cognitive beliefs among high school students affected by generalized anxiety disorder. Findings indicated that physical anxiety thoughts and social anxiety of boys and girls associate to meta-cognitive beliefs about uncontrollability of anxiety, that is, the more anxiety is known uncontrollable- the person will be more likely affected by social anxiety and physical anxiety. Further, there is a significant relationship between anxiety thoughts and meta-cognitive beliefs about uncontrollability of anxiety, that is, there existed a significant relationship between about meta-cognitive beliefs about avoidance from anxiety and meta-anxiety. This implies that the more the individuals believe in danger due to anxiety- they will be more affected by anxiety. With regard to previous research and this research, we deduce that cognitive-behavioral therapy largely affects reduction of anxiety, since the adolescents at age group 15-17 years old are concerned about their academic performance and entrance exam, they more likely experience anxiety and this anxiety affects their physical and mental health as well as their academic achievement. Hence, it is suggested that counselors at universities and schools are trained with techniques of cognitive-behavioral therapy and employ them in controlling anxiety and depression of students.

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Tests	Range of score		cognitive-behavioral therapy		group cognitive-behavioral therapy		Control group	
			X	SD	X	SD	X	SD
Cattell's Anxiety Questionnaire (CAQ)	0-80	pre-test	44.21	0.36	41.25	0.58	42.26	0.658
		post-test	26.25	0.31	21.25	0.54	40.36	0.65
Beck Depression Inventory (BDI)	0-63	pre-test	46.25	0.645	44.25	0.31	43.32	0.687
		post-test	31.25	0.314	24.56	0.32	45.26	0.65

Results of ANOVA pertaining to scores of anxiety

Source of variations	Sum of squares	Degree of freedom	Mean of squares	Statistics	sig
Inter-group	154.45	2	89.5	4.52	0.002
Intra-group	1587.36	28	25.32		

group	No	Mean	Mean	Mean
Control	15	40.25		
cognitive-behavioral therapy	15		26.25	
group cognitive-behavioral therapy	15			21.25

.
Results of ANOVA pertaining to scores of depression

Source of variations	Sum of squares	Degree of freedom	Mean of squares	Statistics	sig
Inter-group	168.25	2	95.25	5.65	0.001
Intra-group	1487.32	28	23.25		

group	No	Mean	Mean	Mean
Control	15	40.25		
cognitive-behavioral therapy	15		31.25	
group cognitive-behavioral therapy	15			24.56

RESEARCH ARTICLE

Investigating the Effect of Natural Landscapes and Green Space on Mental Health Factors [A Case Study of Sistan and Baluchestan UniversityStudents]

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ABSTRACT

The purpose of this study was toinvestigate the effect of landscape and green spaces on three mental factors affecting mental health including stress reduction, attention restoration and evoking positive emotion.These factors were considered as indices of evaluating mental satisfaction and health of the students of Sistan and Baluchestan University. To gather the required data, we used a researcher-made questionnaire. We distributed the questionnaires among the students studying in three levels of education in three faculties. UsingCochran Formula, we computed the sample size 400. Also, we computed the reliability of the questionnaire usingCronbach's alpha [0.92]. To evaluate thedifferencesbetween the variablesandto test the researchhypotheses, we employed inferential statistics[single-sample t-test, Friedmanandone-way variance analysis]. As the findings of Friedman test revealed, stress reduction with the meanof 13.48, evoking positive emotions with the mean of 12.95 and attention restoration with the mean of 12.86 have the highest and the lowest effect on the students' mental health, respectively. Additionally, the effect of the three factors on the three levels of education among male and female students showed no significant difference. The research findings also revealed the highest correlation pertains to the factors of stress relief and evoking positive emotion among the students [r=0.79]. Given to the impact of the green spaces in universities on the students' mental health factors, the authorities are recommended to consider such factors to develop them.

Keywords: green spaces and natural landscapes, students, stress reduction, attention restoration, evoking positive emotions.

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INTRODUCTION

The increasing urbanization development and spatial expansion of cities as well as their industrialization processhave causes to change the modern cities into unpleasant scenes of concrete and cement jungles. Therefore, pressures and tensions of daily life in crowd urban environments have causes that positive metal and physiological effects of natural and green landscapes such as physical health increase, mental peace, more work efficiency , and life quality improvement are considered by citizens ore and more [22]. Today, as a result of cities development and lack of space, natural and green landscapes have been deceased in cities. According to the definition provided by European Landscape Protection Convention [2000],landscape refers to a natural region or feature or a certain culture perceived by people. Also, landscape refers to the combination of vegetated natural or mostly artificial areas [covered by trees, flowers, bushes, grass, etc.] and an environment designed by human to improve biological and welfare conditions of citizens such as green urban spaces, gardens, and parks [3].

According to the previously reported studies, green spaces and natural landscapes can be led to mentally and physiologically positive effects on urban citizens and crowed regions. Principally,appropriate green space in cities and life spaces, in addition to physical health, causes mental peace, higher work efficiency and better quality of life. However, these dimensions are not so considered in designing and planning urban regions and human settlements [2]. According to WHO[29], health does not merely means lack of disease but it means individuals' complete satisfaction about their physical, mental and social statuses. Based on the investigations of this organization, mental health is one of the most important factors of people's general health. Mental health can be defined as a set of conditions including feeling of satisfaction regarding social affairs, personal characteristics and social characteristics [13]. According to the published statistics, it is predicted that mental disorders and cardiovascular diseases will be the most common and serious diseases among both males and females by 2020. As the effects resulted by living in green spaces and natural landscapes, we can refer to decreasing negative outcomes of stress which is highly increased today. During the recent years, community has faced with many challenges regarding stress related diseases. Long term stress is followed by serious and dangerous effects on all vital members such as heart and blood arteries. Therefore, if people cannot find any way of decreasing stress, their health is threatened. Such that, researches show that there is a relation between human health and perceiving surrounding environment. Therefore, the knowledge related to the effect of natural landscapes and people's health can help to decrease stress and increase retrofitting [2]. So, to prevent such a crisis in human communities, healing landscape approach has been increasingly considered in environmental policy making and spatial planning of urban development [1]. Accordingly, visual aspects of nature, the experience of being in nature and fulfilling activities in direct relation with nature can play an important role to promote mental health components [16].

According to the research hypothesis, natural landscapes and green spaces influence mental health through affecting three aspects of stress reduction, attention restoration and evoking positive emotions [Figure 1]. Today, various studies have confirmed the effect of green space on these three mental health components [3, 5, 7,9, 10, 11, 18, 21]. Various approaches and theories have been presented to explain and evaluate the effect of nature on human mental health. A contemporary theories like stress reduction theory of Ulrich have predicted that natural landscapes decrease stress while building environments delay stress improvement [2]. Moreover, according to attention restoration theory of Kaplans[10], the advantages of promoting mental health components in natural landscapes are created by keeping people away from daily activities and concerns, decreasing stress and improving attention, exploration capability in natural environment, and fulfilling activities compatible with nature [22].

Many studies have revealed that seeing natural landscapes and natural images play a significant role to decrease mental boredom and attention restoration [4]. On the other hand, many studies have investigated the effect of natural landscapes on stress reduction [17,18; 24, 25]. Stress reduction theory of Ulrich [26] and other studies [14-15]revealed that observing natural scenes through a window or even in a painting frame can decrease stress [8,28]. The

therapeutic effect of natural landscapes causes mental, emotional and physiologicalchanges [15]. Regarding mental and emotional changes in individuals researchers have reported that observing natural landscapes causes the increase of positive emotions such as satisfaction and peace. Additionally, natural scenes decreases negative emotions such as stress, fear, anger, and sorrow. Furthermore, laboratory and clinical studies on physiological changes in individuals indicate that observing green and natural scenes cause to decrease stress within less than 5 minutes through considerable positive changes in blood pressure, heart rate, muscles spasm, and electric activity of brain [26-27]. Some studies showed that observing natural landscapes increase people's capability to express positive emotions such as hope for future, peace, happiness, and satisfaction of life. According to stress reduction theory of Ulrich [25], evoking positive emotions is resulted by improving mental and physiological conditions [3]. Attention restoration, reducing stress, anxiety and anger, and increasing physical health are resulted by evoking positive emotions in human [7, 12, 27].

Accordingly, designing and creating green spaces and natural landscapes in urban spaces and pulic places can play an important role to improve users' mental health. Educational and academic environments are not excluded from this principle such that green spaces can decrease stress and pressure due to daily challenges of students. So, green spaces cause to improve students' mental health [17].According to the aforementioned, the purpose of the recent study is to investigate the relation between green spaces and natural landscapes on the students' mental health in Sistan and Baluchestan University. During the recent years, increasing construction and spaces development in the yard of Sistan and Baluchestan University, student capacity of above 19000 in various educational levels as well as per capita of above 30 m² of green spaces for each student have been the necessary criteria of selecting this university as the case of our study. Accordingly, the research questions can be formulated as following:

1. What is the status of the students in terms of the effect of green spaces and natural landscapes on their mental health components?
2. What is the status of the students in terms of the effect of green spaces and natural landscapes on their stress reduction?
3. What is the status of the students in terms of the effect of green spaces and natural landscapes on their attention restoration?
4. What is the status of the students in terms of the effect of green spaces and natural landscapes on evoking their positive emotions?
5. Is there any difference among the students regarding the three mentioned components in terms of age, gender and major?

METHODOLOGY

The purpose of the study wasto evaluate the effect of green spaces on attention restoration, stress reduction and evoking positive emotions as well as the relation of the components based on demographic variables such as age, gender, major, and educational level. The population of the study included 400 students of BA, MA and PhD levels in technical and engineering, literature and sciences faculties living at dormitories of Sistan and Baluchestan University[239 females and 161 males]. The participants were selected randomly. For the purpose of the study, we distributed a researcher-made questionnaire among the participants. We evaluated the reliability of the questionnaire by piloting through distributing the questionnaire among 40 students. The, we obtained Cronbach's alpha 0.92. So, we concluded that the questionnaire had a good level of reliability. To evaluate the validity, we used experts' opinions and finally, 25 items were confirmed. Then, the opinions of the students about the relation between natural landscapes on mental health were polled through a questionnaire containing 25 five-point Likert Scale based items.The questionnaire measured the effect of natural landscapes in terms of three indices of attention restoration [8 items], stress reduction [8 items] and evoking positive emotions [9 items]. To analyze the obtained data, we

employed descriptive statistics [frequency table, central tendency indices and standard deviation] and inferential statistics [Friedmand test, single sample t-test, and one-way variance analysis] through SPSS 21.

FINDINGS

Table 1 shows demographic information of the sample.

To evaluate the relation of each mental health indices with each other, we used Pearson Correlation coefficient [see Table 2]. As the table presents, the highest correlation belongs to stress reduction and evoking positive emotions [r = 0.79].

Table 3 presents the results obtained from Friedman test. As sown in the table, the error level is greater than the significance level; therefore, the null hypothesis is rejected. In other words, we conclude that at least one pair of the independent variables [attention restoration, stress reduction and evoking positive emotions] have significant difference with each other. Accordingly, stress reduction with the mean of 13.48, evoking positive emotions with the mean of 12.95 and attention restoration with the mean of 12.86 have the highest and lowest effect of mental health, respectively.

To compare various mental health indices of the male and female students, we used t-test for independent groups. The obtained results showed no significant difference regarding the effect of green spaces on stress reduction among the male and female students [see Table 4]. On the other hand, green spaces on evoking positive emotions in the male students [32.61]were more effective compared to the female students [31.94]. Moreover, its effect on attention restoration in the male students [33.12] was higher than the female students [31.70].

Table 5 shows the one-way variance analysis results obtained from comparing the effect of attention restoration, stress reduction and evoking positive emotions in three age groups of 18-22, 23-26 and above 27. According to the table, there is a significant difference among various age groups regarding the effect of green spaces on stress reduction and evoking positive emotions. However, the effect of green spaces on attention restoration in the age groups of 18-22 [31.94], 23-26 [31.73] and above 27 [31.90] was not significant. Meanwhile, we observed that the effect of green spaces on stress reduction and evoking positive emotions has been higher in the age group of above 27.

Table 6 presents the results obtained from comparing the means of attention restoration, stress reduction and evoking positive emotions at three educational levels. To this end, we employed one-way variance analysis. As shown in the table, there is no significant difference among various educational levels regarding the effect of green spaces on stress reduction and evoking positive emotions. However, the effect of green spaces on attention restoration in the various educational levels was not significant. Meanwhile, we observed the highest [31.73] and lowest [31.80]amount of attention restoration in PhD and BA levels, respectively.

CONCLUSION

The purpose of this study was to investigate the effect of landscape and green spaces on three mental factors affecting mental health including stress reduction, attention restoration and evoking positive emotion. These factors were considered as indices of evaluating mental satisfaction and health of the students of Sistan and Baluchestan University. To gather the required data, we used a researcher-made questionnaire. We distributed the questionnaires among the students studying in three levels of education in three faculties. UsingCochran Formula, we computed the sample size 400. Also, we computed the reliability of the questionnaire using Cronbach's alpha [0.92]. To evaluate thedifferencesbetween the variablesandto test the researchhypotheses, we employed inferential statistics[single-sample t-test, Friedmanand one-way variance analysis].

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Today, mental health, as one of the determining criteria of individual's general health, has a significant role in training students' talents. Tolerating stress existing in academic environments for academic achievement is one of the most important factors to decrease students' efficiency in academic environments. Stress can also lead to mental disorders in individuals. Such that, various studies have revealed that natural landscapes have effective effects on attention restoration, stress reduction and mental health improvement related to the environments without natural elements and landscapes [21, 24]. Some researchers showed that walking in green spaces increases attention restoration [3]. According to stress reduction theory of Ulrich, stress reduction is resulted by affective and aesthetic reactions of people to environment;while, urban environments delay stress improvement[20, 28]. Comparing people living in urban environments and environments with natural landscapes, Harting et al. [19]concluded that there is a significant difference between them in terms of stress reduction, spirit improvement, anger reduction, and attention restoration. Further, Harting et al. [19] reported stress reduction as a result of integrating life with natural landscapes [3]. The findings of the present work showed that green space ishighly effective in stress reduction among the students [with the mean of 13.48]. Huynh et al. [19]investigated the effect of green spaces on 11-16 year adolescents and found that expressing positive emotions and affective satisfaction in males is higher than females. The research findings also revealed that the effect of natural landscapes on evoking positive emotions in the male students [m=32.61] is higher than the female students [m=31.94]. Moreover, the effect of natural landscapes on attention restoration in the male students [m=33.12] is higher than the female students [m=31.70]. On the other hand, some studies indicated that human willingness to green color is due to the scatter of this color in our surrounding environment during the history. Therefore, psychologically, green color is regarded as a calming color and affective to tranquilize muscular tensions as well as creating joyful states [10-11]. Furthermore, some studies have shown that individuals who live in green space for a long time experience less happiness, higher tolerance threshold and less aggregation. Such people also less suffer from diseases such as depression and mental disorders. In addition to the effects due to the presence in green spaces and natural landscapes, we can claim that a substance called Phytoncide is released in the air in green spaces and natural landscapes such as trees. This substance causes a calming and relaxing state for human [2]. Therefore, we can predict that the students who are more subjected to nature and green spaces have less stress compared to others. In such students, psychological components are more rapidly improved and so, they have higher psychological health.

Recommendation

Given to the research findings,it seems that green spaces and natural landscapes are effective to create positive mental and physical reactions and decrease abnormal behaviors in individuals. Also, the more natural landscapes increase positive effects. The present study showed that the effect of green spaces and natural landscapes on mental health components such as stress reduction, evoking positive emotions and attention restoration, with the mean of 13.48, 12.95 and 12.86, have the highest and lowest effect on the students, respectively. Therefore, regarding the effect of green spaces and natural landscapes on mental health components of students in academic environments, the following recommendation are can be presented:

1. Developing green spaces and natural landscapes with natural landscape therapy approach in university environment
2. Considering aesthetic and visual aspects of plants [such as form, texture and color] to design landscapes and green spaces planting university environment
3. Using seasonal flowers and fragrant herbal plants in crowd places of university environment
4. Encouraging students to attend in nature and green spaces of university environment in various ceremonies
5. Designing and creating places to spend free time of students in open and green spaces of university for several hours in a day
6. Creating comprehensive plan of green space development for university environments based on green space standard per capita for each student

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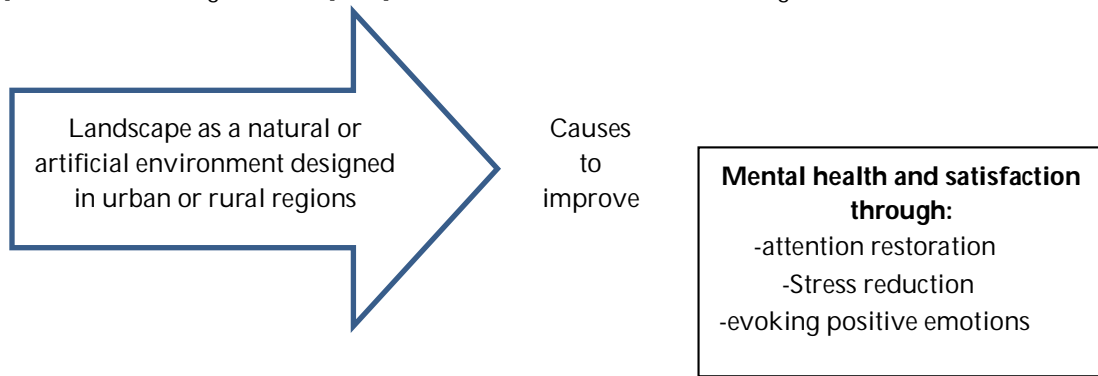
Figure 1. The General framework of natural landscape effects on mental health promotion [3]

Table 1.Demographic information of the sample

Faculty	Educational level			Gender		Total
	BA	MA	PhD	Male	Female	
Technical and engineering	83	27	6	64	46	110
Humanities	149	47	5	119	76	195
Basic sciences	72	23	8	56	39	95

Table 2.The relation of each mental health indices with each other

Variable	Attention restoration	Stress reduction	Evoking positive emotions
Attention restoration	1		
Stress reduction	0/78**	1	
Evoking positive emotions	0/77**	0/79**	1

*The significance level of 1%

Table 3.Friedman test results

Variable	Number	Degree of freedom	Chi-square	Error level	Sig.
Mental health	400	2	18/46	0/05	0/001

Table 4.T-test results for independent groups [P<0.05]

Variable	Gender	Number	Mean	Standard deviation	Degree of freedom	t-test	Sig.
Attention restoration	Male	161	33/12	4/79	0/86	1/16	0/28
	Female	239	31/70	4/73	0/86		
Stress reduction	Male	161	32/58	4/31	0/036	2/86	0/091
	Female	239	32/56	3/91	0/035		
Evoking positive emotions	Male	161	32/61	4/89	1/35	0/052	0/81
	Female	239	31/94	4/85	1/35		

Table 5.Comparing the mean of various mental health components on various age groups

Variable	Age	Number	Mean	Standard deviation	Degree of freedom	F	Sig.
Attention restoration	18-22	218	31/94	4/68	2	0/08	0/92
	23-26	141	31/73	4/75			
	Above 27	41	31/90	5/22			
Stress reduction	18-22	218	32/45	4/00	2	0/92	0/39
	23-26	141	32/51	3/95			
	Above 27	41	33/39	4/82			
Evoking positive emotions	18-22	218	32/20	4/64	2	0/67	0/50
	23-26	141	31/99	5/10			
	Above 27	41	33/00	5/26			

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Table 6. Comparing the mean of various mental health components on various educational levels

Variable	Age	Number	Mean	Standard deviation	Degree of freedom	F	Sig.
Attention restoration	BA	278	31/80	4/62	2	0/45	0/63
	MA	96	31/94	5/16			
	PhD	26	32/73	4/66			
Stress reduction	BA	278	32/34	3/98	2	2/38	0/093
	MA	96	32/82	4/17			
	PhD	26	34/07	4/45			
Evoking positive emotions	BA	278	32/00	4/73	2	2/04	0/13
	MA	96	32/33	5/16			
	PhD	26	34/00	5/04			

RESEARCH ARTICLE

The Economic Valuation of Arasbaran Forests' Animal Species in Iran (An Application of Contingent Ranking Approach)

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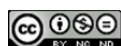
ABSTRACT

Regardless of the preserving, economic, social and cultural attractions, Arasbaran forests have provided unique treasures of environmental resources in the northwestern Iran due to rare plant and animal species they host. Recent destruction and deforestation activities have led to loss of a large portion of forest-associated interests, besides this has endangered the animal species' Lifeisin it, thus motivating forest conservation stirs. Since one of the best ways to preserve such treasures, especially in the countries withpooreconomy, is to use people's aid, the present study aims to estimate the economic value of Arasbaran forests' three valuable animal species using contingent ranking method. Required data was acquired through field studies and questionnaires filled by 334 visitors and citizens from ten cities in three provinces: East-Azerbaijan, West Azerbaijan and Ardabil. According to the valuation method used in this study, the Ranked ordered Logit regression model was applied. Results showed that the tiger, with 18.2 million dollar and the bear, with 8.6 million dollar values are the most and the least valuable animal species. Based on the results, respondents' level of education, income, number of annual visits from the forests and their friendly attitudes towards Arasbaran forests had significant positive impacts on WTP of respondents for the animal species. Results of the present study can be served as proper guidelines not only for policymaking and planning purposes, but also to attract public participation in the course of conservation and sustainable use of the valuable resources.

Keywords: Arasbaran forest, contingent ranking, ranked ordered logit, economic valuation of animal species

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INTRODUCTION

Accelerating economic developments through recent decades has caused excessive pressure on global environment which has faced irreversible damages to natural resources around different countries. Hence, concentrating on environmental impacts of development patterns gradually becomes more important, so that attention to environmental issues and following them, in rich countries is the main cause of economic transformation.The civilized world must move to a new approach from "economic environment" to "environmental economics". The approach needs to be strengthened and supported by interdisciplinary cooperation between specialists of natural resources and environmental experts with elites and governmental economic experts and policy makers since further this issue is one of the most essential parts to ensure sustainable development.

Economic valuation of environmental resources led to the discovery of the demand curves for environmental goods and environmental services and the value that people attach to the environment. A basic condition for the policymakers and planners to changes destructive applications of environmental resources is the economic analysis and detailed assessment of the resources (Bateman and Willis,1999). Unlike the values that forests have, increasing population has led to increased demand for forest goods and services and thus increases the rate of deforestations. Statistics show that between 2005 and 2010, the population growth rate which was the lowest in Europe has the lowest rate of degradation of forest resources (about 0.1 percents) and African continent with the highest population growth rate has the highest rate of deforestation in the world (about 0.8 percent) (Fao, 2010). Along with degradation and loss of forest resources, the quality and quantity of services that benefit the community are reduced. Awareness of the benefits that the destruction of forest resources take away from the community, motivates the protection activities of these resources. In other words, this leads to a willingness to pay for forest conservation.

According to estimates presented by the World Bank, the net present value cost of damages caused by deforestation and degradation of forests in the Caspian Sea in Iran, which is the loss of benefits and functions of the forest in 2002, is about 760 $ and 147 million $ respectively which is 0.8 of Iran's GDP in this year (World Bank, 2005).

There are various divisions of the economic value of natural resources such as forests.The non-consumption values are one of them which includes the "refugium function" (Protection of animal species).

The total area of East Azerbaijan's forests are about 188,000 hectares in which about 164000 hectares of forest belongs to Arasbaran. The area of 148,000 hectares of this forest has been reported as conservational and protected forests. (Approximately 78,560 hectares-about 56% of the area-are specified as protected forests). Arasbaran is very diverse in the terms of biodiversityand isthe only habitant of Black Cock which is one of the rarestbirdsin the world.With respect to Arasbaran's biodiversity, specific climatic conditions, the existence of 1072 species of plants and 97 species of wood have been reported in the area, therefore it is supported as a reserve of "Biosphere" by UNESCO since 1976 and is one of the ten Biosphere reserves in Iran. Arasbaran with its beautiful nature, pleasant landscapes, historical monuments and places of power has a powerful potential to attract tourists. Medicinal plants in the region with significant value, as one of the pillars of regional development can be of particular importance (Department of Natural Resourcesin East Azerbaijan, 2003).

Due to the deforestations and exorbitance hunting, the animal species in the forests are in the danger of demolition (Department of Natural Resourcesin East Azerbaijan, 2003). Arasbaran forests are one of the natural treasures which are located in Iran's North West region and like any other natural sources consist of non-use values. The overall purpose of this study is to estimate the habitant value of Arasbaran forest which is a large part oftotaleconomicvalue of these forests. Since in the developing countries, with fragile economic conditions, one of the most important ways to preserve the environment and forests are public aids, many studies have tried to evaluate the public willingness to pay for environmental protections.

Because of the importance of economic valuation of environment including the forests, from the point of public view, many researchers have addressed this issue. In some studies Contingent Valuation Methods have been applied to estimate the economic value of forests and other environmental services (Sattout et al. 2007, Khodaverdizadeh et al. 2008, Barala, et al. 2008, Mollaee, 2009, Pattison, 2009, Jahanshahi and Mousavi, 2011, Tao et al., 2012).

Some other researchers have used the choice experiment for environmental valuations. (Meyerhoff et al. 2009 Taylor and Tongo 2010,Wallmo and Lew 2011, Cerda et al. 2013, Salehnia 2011). In other studies contingent ranking approach is applied for economical valuation of environment (such as: Garrod and Willis 1997, Kumar and Kant 2007). In some studies, to assess the recreational value of the environmental services, the travel cost method is used (such as: Hayati et al. 2011, Chae et al. 2012). While some studies have used two valuation methods and tried tocompare their results in valuation of environment (like: Sayyadi et al. 2005, Bateman et al. 2006, Mogas et al. 2009). Results from literature review indicate that despite the different effects of variables in the studies, briefly, factors such as demographic, economic and social variables associated with each studied resource's characteristics, besides respondent's environmental attitudes could influence respondent's willing to pay (WTP) for different features of environmental resource, including the living animal species on it.

Given that the non-productive functions, including refugium functions are the most valuable functions of Arasbaran forest and one of the most important ways to protect and restore natural resources such as forests is assistance of public participation, motivating social orientation, in order to protect this resource is valuable. The emphasis of this study is estimation of people's WTP for Arasbaran forests' animal species using the Contingent Ranking (CR) method, which seems to be compatible with the general behavior of a consumer which is based on ranking of preferences and choosing between them. Therefore, The rank-ordered logit model, which is also suitable for CR method and is introduced by Beggs et al(1981) is applied in this study. Since Arasbaran possesses numerous biodiversity and animal species, to do the research, three main species: the Tiger, the Black Cock and the Bear were chosen among them through the pre-test andInterviews withexperts.

MATERIALS AND METHODS

The economic value as a valuable tool is connected to the human utility maximizing and is a human-oriented value. This means that it is based on people and their preferences. If there was a direct market for environmental goods and services, using the normal pricing methods to value environmental services, would be possible. But the lack of a suitable market for many environmental functions makes usage of these methods almost impossible. Hence one of the best methods of estimating non-market services is stated preference methods.

Stated preference methods, have beendevelopedin recent decades. These methods attempt to measure people's willingness to pay directly.The stated preferences approach relies on the data which gather through direct questioning of respondents and their preferences.The methods consist of several valuation techniques. The common feature of all these techniques, are the direct questions from people about their possible choices, in a hypothetical market. This approachincludes "contingentvaluationmethods" (CVM)and"multi-valuation techniques"such as: "choice experiment"and "contingent ranking". In the present study, the contingent ranking method is applied.In this approach, the respondent is asked to rank his choices according to his preferences from the most important to the least important alternatives. For this reason, ranking data, could offer more information comparing with the choice experiment (in which respondent is asked to choose between deferent alternatives). However, this method is more complicated compared to other methods. Contingent ranking method could result in welfare- adapted estimations, provided that the status quo option is one of the alternatives in the choice series. So that in the case the respondent does not interested in any of improvement alternatives, could choose that one (Liu and Wirtz , 2010).

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Implicitpriceof eachattributeis the finalrateof substitutionbetweennon-monetaryandmonetaryattributes and it is calculated from the ratio of non-monetary factor to the monetary one:

$$M\arg inal\,WTP = -\left[\frac{\beta\quad non-monetary}{\beta\quad monetary}\right]_{(1)}$$

The firstand most important stepin amultiple valuation techniques, including contingentranking, is designing of choicecards. To this end, the main attributes of the resource and the level of each attribute is identified; then the cards and henceforth the questionnaire are designed according to the characteristics of the test. In practice, attributes are selected from reviewing of previous studies or interviewing with experts group (target group). It should be noted that the price paid for the studied resources are one of the reviewed attributes and through the monetary factor it is possible to estimate the willingness to pay for each attributes of the forest. Also the levels of each attribute are identified through the exploratory studies, literature reviews and interviews with the target groups. The statistical design theory is used for level compositionandformationofappropriatescenarios to present to the respondents. Complete factorial design is one of the available options in this stage, however,because of alarge number ofcompoundsin this technique, alternative methodssuch as"Partial factorial design" is used in which thenumber ofpossible combinations are greatly reduced.

Table 1 shows the selected attributes (animals) in valuation of Arasbaran forests' animal species. As it can be seen, the refugium functions of Arasbaran forests are divided into 3 attributes (three main animal species) with 3 levels. In this regard, the 12 alternatives and 6 choice set was determined that were gathered in 2 trio-blocks. The SAS 9.2 software was used for designing the cards. Each choice set, includes the relative improvement and optimum conditions of animals besides one status quo option.

All levels have special characteristics which are presented in Figure 1. The characteristics of each level are designed and presented to the respondents through consulting with the Environment Agency's experts and their improvement plans for the Arasbaran forests

Figure 2. shows a sample ofthe selectedcardsto calculate thevalue of three chosenanimal species ofArasbaran forests.

Ranked ordered Logit model (exploded logit regression)

The exploded logit regression conducted in many marketing researches. This model, in fact, is the expanded conditional logit model of McFadden (1987) which is presented by beggs et al (1981) in the economic literatures. The model was developed by Hausman and Rudd (1987) and presented entitled Ranked ordered logit model. Basic techniques of this model is based on random utility model (RUM)(kummar and count, 2007).

It is supposed that respondent i derive utility U_{ij} for each animal value j, which includes a systematic component μ_{ij} and a random component ε_{ij} :

$$U_{ij} = \mu_{ij} + \varepsilon_{ij} \tag{2}$$

The respondent i would rank the animal species j upper than animal species k, providing that $U_{ij} > U_{iik}$. The error terms ε_{ij} is supposed to be independent and identically distributed, and assuming that:

$$\Pr ob\left(\varepsilon_{ij} < t\right) = \exp\{-\exp(-t)\} \tag{3}$$

Therefore the odds of ranking j higher that k could be explained through:

$$\exp\{U_{ij} - U_{ik}\} \tag{4}$$

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The utility's systematic component U_{ij} can be specified through a linear function of a set of explanatory variables X_i s as below:

$$U_{ij} = \beta_j X_i$$

(5)

In which the X_i vector contains some variables which describe respondents' characteristics yet they do not differ among various biodiversity of the forest. Also β represent coefficients' row vector which should be estimated. The coefficients for those variables would differ among forest attributes, moreover one of the β_j vectors needs to be set equal to 0 for the identification achievement (the selection of the reference animal species is arbitrary).The model is equipollent to the common multinomial logit regression model. Although, the name "exploded logit" name is applied to indicate an observed rank ordering ofJ animal species and could be regarded as an "explosion" into J-1 independent observations, in a way that if $U_{i1} \succ U_{i2} \succ ... \succ U_{ij}$, it can be expanded as: $U_{i1} \succ U_{ij}$, $j = 2,...,J$ و $U_{i2} \succ U_{ij}$, $j = 3,...,J$ و ... و $U_{ij-1} \succ U_{ij}$ (Salomon, 2003).Therefore, the data are considered to be a sequence of choices, in which the animal species or value with the highest preference is chosen over all other species, while the value with the second highest preference is picked out over all but the first one, and this can be continued like above. This explosion is possible through the independence assumption from irrelevant alternatives (IIA) which is also known as Luce's choice axiom, which indicates that the relative preference for any two forest attribute is indifferent to the choice set's other features (kummar and count, 2007).

The random utility model connotes the following likelihood L_i for a single respondent as below:

$$L_i = \prod_{j=1}^{j} \left[\frac{\exp\{\mu_{ij}\}}{\sum_{k=1}^{j} \sigma_{ijk} \exp\{\mu_{ik}\}} \right]$$

(6)

in which the $\sigma_{ijk}=1$, if $Y_{ik}>Y_{iJ}$, and $\sigma_{ijk}=0$, otherwise.

The statistical population of this study, is approximately 334 people which are chosen randomly between visitors of the Arasbaran forests and also citizens of ten neighborhood cities (all were Within a radius of250km from the forests), from three abutting provinces: West Azerbaijan, East Azerbaijan and Ardabil. It should be noted that the sample size is calculated using the formula introduced by Orme (1998).

RESULTS AND DISCUSSIONS
Descriptive results of statistical population

Statistical characteristics of respondents are presented in Tables 2. The mean of age variable represents a middle-aged population of respondents. The majority of study subjects were married men and individuals with small families. The mean of annual gross income indicates a normal income for majority of respondents, which have less than 1 visit per year from the forests. The ars variable indicates individuals' friendly attitude toward Arasbaran forests. (Index of friendly attitude towards Arasbaran). The index was consisted of 10 speeches to measure respondents' friendly attitudes towards the forests, such as ignoring some utilities for safeguarding them. Each species is evaluated through codes from 5 (very important) to 1 (not important). Mean of this variable indicates relative importance of Arasbaran forest from respondents' point of view. Also the variable **edu** represent the education level of respondents,

which is an ordinal variable identified as: 1=Illiterate, 2= Primary School, 3= Junior high school, 4= Senior high school,5= Associated Diploma (AD), 6= BSc,7=MSc and 8=PhD. Mean of this variable states that most respondents have academic education levels.

Inferential result of estimating the value of animal species

Table 3, shows the result of estimation of ranked ordered logit regression to determine the value of animal species of Arasbaran forests. The variablescockmed and cockwell show the relative improvement and optimum condition of blackcock, respectively. Also variables bearmed and bearwell indicate the relative improvement and optimum condition of bears in the Arasbaran forests, respectively. Moreover the variables tigermed and tigerwell show the relative improvement and optimum condition of the tigers in he forests, respectively. Finally the variable P, shows the bid price.

Toinferthe effectsof individualvariables that affect people's willingness topay, the ranked ordered logit model with interactions of bid price (p) with these factors was also estimated, which the results of estimation of both models are presented in the table 3. The variables pedu, pinc, pars and pbaz show the interactions of P with respondent's education level, his income, his friendly attitude towards the Arasbaran forests and his number of annual visits from the forests, respectively.

According to the tables' result, relative improvement and optimum condition of each attributes have positive effect on respondents' WTP, as expected. Also according to the interaction model results, respondents' level of education, their income, their number of annual visits from the forests and their friendly attitudes towards Arasbaran forests significantly increases the WTP of respondents for the animal species. The similar results from these variables' positive effect on respondents' WTP are presented in the other studies such as: Sayadi, et al (2005), Bateman, et al (2006), Sattout, et al (2007), Mogas, et al (2009) and Tao, et al (2012). The monthly, annual and total (considering population of three studied provinces) WTP for each animal species is calculated through equation (1), and the results are presented in the table 4. As it can be seen the tiger and the bear are the most and the least important features, respectively. The same ranking results were obtained through the direct ranking question of the attributes which was asked from the respondents in the questionnaire.

CONCLUSION

As it can be inferred from table 4, public willingness to pay for animal species of Arasbaran forests is a large amount of money. This issue shows the great importance of environmental valuation especially the habitant value of Arasbaran Forests.The study's results showed that total economic valuation of Arasbaran forests is considerable amount of money. This issue could be helpful in the policy making for the improvement of forests condition, especially the habitant condition of the forests since the people's aid, considering the present situation of Iranian economic, could provide a major amount of money for preserving the environmental resources including Arasbaran forests.

On the other hand, Prioritizing of the animal species shows that the tigerand the blackcock are the favorite animal species among the other ones. This could be helpful in the prioritizing of the improvement plans of Arasbaran's habitant situations. Also along with the betterment of their condition,making a natural zoo in the forests, thatcould increase the tourism income of the region and these earnings could be used for investment for the improvement of forests' environmental conditions and increasing the utility of consumers.

The positive relation between income and WTP indicates that improvementofincomeinforested areas could help to better the habitant conditions. In this respect suitable policies and employment programs along with policy makings which support the environmental protection programsare suggested.Finally since the study shows a significant link

between respondents' positive tendencies towards Arasbaran forests, assisting NGO's formation regarding environment, especially forests, and related subjects, along with encouraging them to do activities todevelop society's awareness of environmental resources and their values, besides disadvantages of deforestation and other environmental damages, is another suggestion; since the philosophy and nature of such organizations is to raise these kinds of information in the society or do activities like that. Besides them, governmental activities, like special TV programs, or advertisement billboards in appropriate places to augment society's knowledge towards natural treasures like forests is suggested.

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Table 1. The studied Attributes and their levels of Arasbaran forests

Bid price (Rials)*	Refugium function (ProtectedSpecies)	Attributes
Refugiumvalue (the value of animal species) ofArasbaran forests		
5000	Crisis	levels
15000	Relative Improvement	
25000	Optimum	

Each Rial is about 3.5×10^{-5} Dollar

Table 2. Variable definition and sample statistics

Variable	definition	Mean	SD	Min	Max
Respondent's Income	inc	534.3	740.761	250	6000
Age of	age	40.396	7.70	23	71
gender	gndr	0.73	0.445	0	1
Level of education	edu	5.86	1.01	4	8
Family size	fmlsz	3.46	1.3	1	7
Number of annual visits	vst	0.63	0.73	0	3

Table 3. Estimation result of rank-ordered Logit model about information and refugium functions of Arasbaran forests

Rank-ordered logit regression with interactions		Rank-ordered logit regression		Variable
Standard eror	coefficient	Standard eror	coefficient	
0.0000609	***-0.0010702	0.000036	***-0.0001743	**p**
0.0361	***0.4045017	0.0450725	*** 0.3873823	**cockwell**
0.047	***0.2407826	0.0477137	*** 0.3082979	**cockmed**
0.066	***0.3465291	0.0425571	*** 0.3027793	**bearwell**
0.034	***0.2287397	0.0426952	***0.1789439	**bearmed**
0.049	***0.8272083	0.0482734	*** 0.9892697	**tigerwell**
0.037	***0.384452	0.0621523	***0.443937	**tigermed**
.0000127	***0.0000297	-	-	**Pedu**
1.41e-08	***3.87e-08	-	-	**Pinc**
0.0000224	***0.0001832	-	-	**Pars**
0.0000189	**0.0000709	-	-	**Pbaz**
LR chi2= 1109. 30 , Pseudo-R²=.42		LR chi2= 724.62 , Pseudo-R²=.37		

Table4: Results of WTP extracting and ranking of information and refugium features

Optimum condition of tiger	Relative Improvement of tiger	Optimum condition of bear	Relative Improvement of bear	Optimum condition of blackcock	Relative Improvement of blackcock	Attributes and their levels
772.947	359.233	323.798	213.73547	224.988	377.968	**Ind. monthly WTP(Rials)**
4310.805	9275.369	2564.826	3885.581	2699.861	4535.62	**Ind. annual WTP(Rials)**
347178.649	747008.886	206562.952	312932.446	217438.270	365284.492	**Total WTP(million Rials)**
547093.7678 **(18.236 million $)**		259747.6993 **(8.658 million $)**		291361.3816 (9.712 million $)		**Mean of two levels (million Rials)**
1		3		2		**Ranking of features**

Alternative C	Alternative B	Alternative A	attributes/ levels	
I do notwantanychange inthe current situationandI am not willing to payanyfeeforit.	Relative Improvement	Optimum		The Black Cock
	Optimum	crisis		The Bear
	Optimum	crisis		The Tiger
	25000	5000		**WTP(Rials)**
○	○	○	Please selectfrom 1 to3above,you willprefer **(1 is the best)**	

(Question 1)

Figure 2: A sample of the selected cards to calculate the value of three animal species of Arasbaran Forests

Optimum condition	Relative improvement	Critical situation	attributes/ levels
Development and conservation of reserves, trying to increasere productive, especially valuable animal species, creating reproduction centers for species that they are not capable of regeneration normally. Creating specialized centers for on going health study of animal species heaths.	Improve of certain circumstances, for changing the health of ecosystems and facilitate the lives of animals and preventing the destruction of the animals, creating a mobile veterinary clinics and periodicsurveysofhabitat.	**Present conditions (Status Que)** (the peril of valuable animal species and insufficient managements in order to protect them)	**(Protected Species)**

Figure 1. The information and refugium functions and explanation of their levels for the Arasbaran forests

RESEARCH ARTICLE

Designing a New Fuzzy Optimal Subsynchronous Damping Controller Based on STATCOM to Improve Power System Stability

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ABSTRACT

Series compensation of transmission lines connected to turbo generators can result in Sub Synchronous Resonance (SSR) leading to adverse torsional oscillations. SSR leads to turbine-generator shaft failure and system instability.The use of Flexible AC Transmission System (FACTS) controllers such as Static Synchronous Compensator (STATCOM) are increasing in the network for enhancing power transfer capability, dynamic voltage support and also damping of power oscillations. STATCOM is one of the most versatile flexible ac transmission system (FACTS) controllers which controls the reactive power flows in transmission lines originating from a substation while controlling the sending end bus voltage. This paper reports the analysis and study of novel supplementary subsynchronous damping controller (SSDC) for STATCOM which is capable of damping out subsynchronous Resonance (SSR) oscillations in power system with series compensated transmission lines. Proposed SSDC for STATCOM is designed based on a hybrid fuzzy optimal controller to damp all SSR torsional oscillations. Simulation results which is obtained by MATLAB, verify the effectiveness of proposed technique and its control strategy for enhancing stability.

Keywords:STATCOM, Oscillation Damping, Fuzzy Controller, Optimal Controller, Sub Synchronous Resonance.

INTRODUCTION

Series capacitors have extensively been used as a very effective means of increasing the power transfer capability of a transmission lines and improving transient and steady state stability limits of power systems [1-3]. These improvements are done by compensating reactance of the transmission lines. Besides of having remarkable profits

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for this kind of compensation for transmission line, the risk of SSR could also be brought to the power system which could cause severe damages to the shaft of the generator unit [4,5]. SSR is a condition of an electrical power system where electrical networks exchange energy with the mechanical system of the generator at frequencies less than the nominal frequency of the transmission line [6]. At this situation, the turbine-generator oscillates at a frequency corresponding to the torsional mode frequency. The torsional oscillations may raise and result in the failure of the turbine shaft.

Numerous papers have been published about damping the SSR phenomenon. Eigenvalue analysis [7–9], frequency scanning method [10–12], time domain simulation [13] and Using Flexible AC Transmission Systems (FACTSs) controllers such as the static synchronous series compensator (SSSC) [14,15,16], the unified power flow controller (UPFC) [17], the thyristor controlled series capacitor (TCSC) [18] and high voltage direct current (HVDC) transmission systems [19,20] have been applied to prevent the SSR in power systems. Rotor oscillations of generator at a torsion mode frequency, (fm) induce armature voltage components at frequencies (fern) given by:

$$f_{ern} = f_o \pm f_m \qquad (1)$$

When the subsynchronous component term is close to electrical resonant frequency, the subsynchronous torques produced by subsynchronous voltage components can be sustained. This interplay between electrical and mechanical systems is termed as torsional oscillations [4-8].

As a new type of reactive power compensation FACTS device, STATCOM has a fast and smooth control performance. By applying appropriate control strategies, STATCOM could be used to damp power frequency oscillation, enhancing power transfer and voltage stability.

In this paper, the damping of torsional oscillations using STATCOM will be study and novel supplementary subsynchronous damping controller based on fuzzy optimal technique is proposed.Optimal control method which is used along fuzzy damping controller will be designed based on linear quadratic regulator (LQR) that minimizes the cost function in order to achieve the optimal tradeoff between the use of control effort, the magnitude and the speed of response. Also it guarantees a stable control system. The Fuzzy logic is used to design of control system in outer loops of controller and designed supplementary controller for damping oscillation in STATCOM. Simulation results which is obtained by MATLAB, verifies the effectiveness of the STATCOM and its control strategy for damping SSRoscillations

Dynamic modelling of statcom

The system considered is an IEEE benchmark used to study subsynchronous resonance. The modeling aspects of the electromechanical system are given in detail in reference [21]. This system is shown in Fig.1.

One convenient method for studying balanced three-phase system (especially in synchronous machine problems) is to convert the three phase voltages and currents into synchronous rotating frame by abc/dq transformation. The benefits of such arrangement are: the control problem is greatly simplified because the system variables become DC values under balanced condition; multiple control variables are decoupled so that the use of classic control method is possible, and even more physical meaning for each control variable can be acquired. Equations (2) to (4) give the mathematical expression of the STATCOM shown in Fig 1.

$$\frac{di_{sd}}{dt} = -\frac{R}{L}i_{sd} + \omega i_{sq} + \frac{1}{L}(V_{td} - V_{sd}) \qquad (2)$$

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$$\frac{di_{sq}}{dt} = -\omega\, i_{sd} - \frac{R}{L} i_{sq} + \frac{1}{L}(V_{tq} - V_{sq}) \tag{3}$$

$$\frac{dV_{dc}}{dt} = -\frac{3(V_{td}i_{sd} + V_{tq}i_{sq})}{2C_s V_{dc}} \tag{4}$$

Fig.2 illustrates the detailed control block diagram of STATCOM according to dynamic equations [22-24].

Optimal controller based on lqr

The theory of <u>optimal control</u> is concerned with operating a <u>dynamic system</u> at minimum cost. The case where the system dynamics are described by a set of <u>linear differential equations</u> and the cost is described by a <u>quadraticfunction</u> is called the LQ problem. One of the main results in the theory is that the solution is provided by the linear-quadratic regulator (LQR), a feedback controller whose equations are given below.

This method determines the feedback gain matrix that minimizes the cost function in order to achieve the optimal tradeoff between the use of control effort, the magnitude and the speed of response. In addition, this method guarantees a stable control system.

Given a linear system:

$$\dot{x}(t) = Ax(t) + Bu(t)$$
$$y = Cx(t) \tag{5}$$

Where x (t) are the system's states, u(t) is the system input and y(t) is the output. The objective is to design a feedback $u(t) = -Kx(t)$ such that the cost function (4) can be minimized:

$$J = \int_0^\infty (x^T Q x + u^T R u)dt \tag{6}$$

The weighting matrices Q and R are positive semi-definite. They control how much effort should be put on the controller. The feedback gain K is obtained by getting matrix P first via solving the Riccati equation:

$$A^T P + PA - PBR^{-1}B^T P + Q = 0 \tag{7}$$

Therefore,

$$K = R^{-1}B^T P \tag{8}$$

When the feedback gain K is obtained, the LQR controller can be easily designed to make the states approach zeros optimally.

Writing equations (2), (3) and (4) in the state space format as (5), the corresponding matrix can be found as:

$$A = \begin{bmatrix} -\dfrac{R}{L} & \omega \\ -\omega & -\dfrac{R}{L} \end{bmatrix}, B = \begin{bmatrix} \dfrac{1}{L} & 0 \\ 0 & \dfrac{1}{L} \end{bmatrix}, C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Where, the states $x = \begin{bmatrix} i_d \\ i_q \end{bmatrix}$, the inputs $u = \begin{bmatrix} v_{td} - v_{sd} \\ v_{tq} - v_{sq} \end{bmatrix}$ and the output are $y = \begin{bmatrix} i_d \\ i_q \end{bmatrix}$.

Since the LQR controller is designed to drive the states to zero. This is very restrictive and not suitable for solving tracking system problem. In the STATCOM control, line currents are to be followed. Therefore, alteration must be applied to the LQR controller in order to drive the current errors, instead of the currents, to zero. To achieve zero steady state errors, an integrator is inserted in the control loop and the original system is augmented to include the errors as new system states [4].

$$\begin{bmatrix} \dot{x}(t) \\ \dot{e}_I(t) \end{bmatrix} = \begin{bmatrix} A & 0 \\ -C & 0 \end{bmatrix} \begin{bmatrix} x(t) \\ e_I(t) \end{bmatrix} + \begin{bmatrix} B \\ 0 \end{bmatrix} u(t) + \begin{bmatrix} 0 \\ I \end{bmatrix} r \qquad (9)$$

In equation (8),

$$u(t) = -K(t) \begin{bmatrix} x(t) \\ e_I(t) \end{bmatrix} = -\begin{bmatrix} K_x(t) & K_I(t) \end{bmatrix} \begin{bmatrix} x(t) \\ e_I(t) \end{bmatrix} \qquad (10)$$

Rewrite the cost function in format of (10), it shows that the new LQR regulator is aimed in minimize the errors.

$$J = \int_0^t e_I^T(t) e_I(t) + u^T(t) R u(t) dt$$

$$= \int_0^t \begin{bmatrix} x^T(t) & e_I^T(t) \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 0 & I \end{bmatrix} \begin{bmatrix} x(t) \\ e_I(t) \end{bmatrix} + u^T(t) R u(t) dt \qquad (11)$$

The control block diagram of the LQR current control loop which is proposed for STATCOM is shown in Fig.3.

Controller design based on fuzzy logic

Fuzzy control is a control method based on fuzzy logic. Just as fuzzy logic can be described simply as "computing with words rather than numbers"; fuzzy control can be described simply as "control with sentences rather than equations"[25]. A fuzzy controller can include empirical rules, and that is especially useful in operator controlled plants. Different parts of fuzzy controller are shown in Fig.4. The major components of a typical fuzzy controller are fuzzification, fuzzy rule base, fuzzy inference, and defuzzification.Fuzzification is the process of decomposing a system input and/or output into one or more fuzzy sets. A fuzzy set is represented by a membership function defined on the universe of discourse. Fuzzy rules represent the control strategy. They are linguistic if-then statements involving fuzzy set, fuzzy logic, and fuzzy inference [26]. Fuzzy rules play a key role in representing expert control knowledge and experience and in linking the input variables of fuzzy controllers to output variable (or variables).Fuzzy inference is used in a fuzzy rule to determine the rule outcome from the given rule input information [27].

In this article a fuzzy PI-D control units is used with the STATCOM control circuit. This controller is shown in Fig.5.in this figure the derivation of the fuzzy control law is performed in two steps: one for the output of the fuzzy PI controller and the other for the output of the fuzzy D controller. The final control law combines these two individual control laws together in an appropriate way. As follow:

$$u_{PID}(nT) = u_{P1}(nT-T) + K_{UR}\Delta u_{P1}(nT) + $$
$$u_D(nT-T) - K_{u_D}\Delta u_D(nT)$$

　　　　　　　　　　　(12)

Readers for more detain can refer to [25-27].

Proposed optimal pi-d fuzzy controller for ssr oscillations damping

In this article optimal control method based on LQR minimizes the cost function in order to achieve the optimal tradeoff between the use of control effort, the magnitude and the speed of response. Also it guarantees a stable control system. The Fuzzy logic based on PI-D controller is implemented to control system in outer loops of controller and designed supplementary controller for damping oscillation in STATCOM.

It is well known that damping of power system oscillations can be improved by developing a torque in phase with the speed deviation. Choice of a measurable input signal is the main consideration in the design of a damping controller. So for damping purposes, speed deviation of the generator is used as input to the damping controller and added to the outer dc voltage control loop. This signal brings to a controller who designed based PI-D fuzzy controller based on optimal controller as it shown in Fig.6.

SIMULATION RESULTS

In this paper the case study system is an IEEE benchmark used to study subsynchronous resonance and particularly torque amplification. It consists in a single generator (600 MVA/22kV/60 Hz/3600 rpm) connected to an infinite bus via two transmission lines, one of which is 55% series-compensated.

The subsynchronous mode introduced by the compensation capacitor after a three-phase fault has been applied and cleared excites the oscillatory torsional modes of the multi-mass shaft and the torque amplification phenomenon can be observed. The mechanical system is modeled by 3-masses: mass 1 = generator; mass 2 = low pressure turbine (LP); mass 3 = high pressure turbine (HP).

Disturbances are accrued in system according table.1.

Fig.7 shows the membership functions for fuzzy controller that used in outer dc voltage control loop. Error, deviation error and controller output range for all fuzzy controllers are shown in Table.2.

Figures 8-12 describe the response of series compensated system without STATCOM. Figures 8-10 are shown rotor speed of generator and High and Low pressure turbine shaft speed. Fig. 11 presents torque between generator and low pressure and Fig. 12 show torque between generator and high pressure. It is obvious that the compensated system with series capacitive will be unstable when a 3 phase fault is occurred.

 Figures 13-24 are shown system characterizations after STATCOM installation. Fig. 13 presents the output voltage of STATCOM which is changed on during the faults. Fig.14. shows the rotor speed deviation of different masses in shaft-rotor system. As it is shown, oscillations in speed are damping during the simulation time especially when faults are accrued. Fig.15. represent torque deviation on different masses. Because of using damping controller in STATCOM, torque oscillations are damping. Based on control strategy in STATCOM, DC voltage of converter must be constant in all time of simulation. Fig.15. demonstrate this fact. Figs.16.17. show the three level output voltage of converter. Also, voltages of buses are shown in Fig.17-Fig.21. all voltage has negligible harmonic because of appropriate filter tuning in output of inverter. Current components are shown in Fig.22-24. Position of this current was shown in Fig.6. This is describing proposed technique in this article.

CONCLUSION

In this paper, a novel supplementary subsynchronous damping controller (SSDC) for STATCOM which is capable of damping out subsynchronous Resonance (SSR) oscillations in power system is proposed. This damping controller is designed based on optimal PI-D fuzzy controller. The presented simulation results show that STATCOM based on proposed controller is capable to power system oscillation damping and. The simulation results support the applications of optimal fuzzy controller in power systems.

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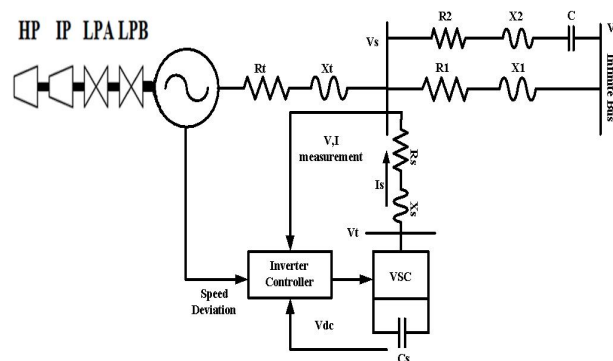
Fig.1 Single line diagram of IEEE benchmark test system
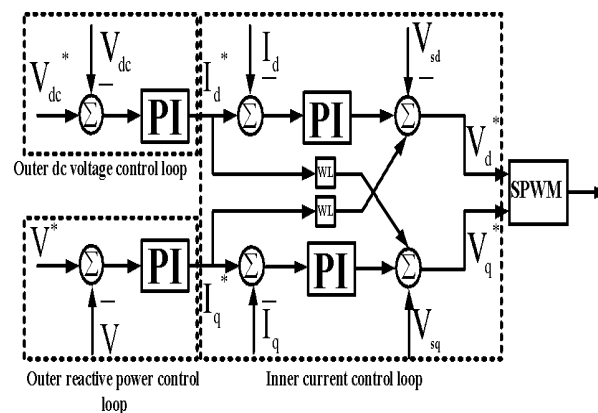
Fig.2 The detailed control block diagram of STATCOM.

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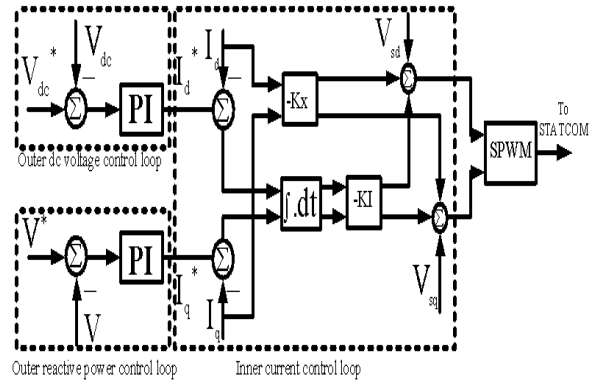
Fig.3 The control block diagram of the LQR current control loop.
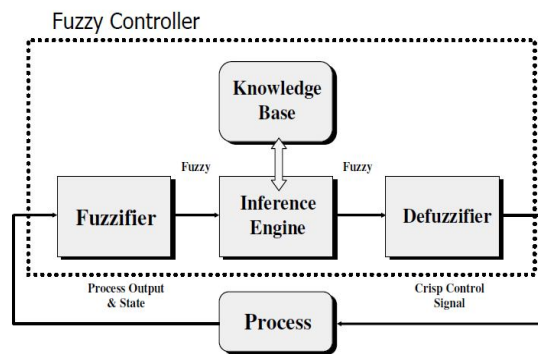
Fig.4.Common Structure of Fuzzy Controller
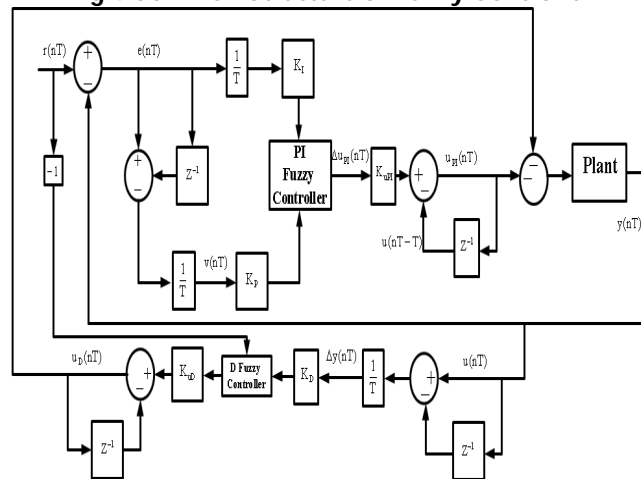
Fig.5.PI-D Fuzzy Controller

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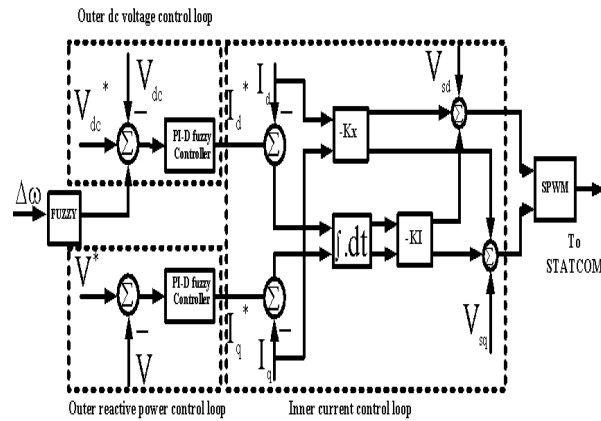
Fig.6 Proposed Optimal Fuzzy PI-D Supplementary Damping Controller

Table.1.Disturbances	
Type of Disturbance	**Time of Occurrence**
3 phase fault	$t = [2.5 + \dfrac{1}{60}, 2.5 + \dfrac{5}{60}$
Add a Inductive Load	$t = [1.5, 2.5]$

Fuzzy rules that are in fuzzy controllers are shown in Table.2.

Table.2. Fuzzy controller's rules					
e \ Δe	**PB**	**PS**	**ZE**	**NS**	**NB**
PB	PB	PB	PS	PS	ZE
PS	PB	PS	PS	ZE	NS
ZE	PS	PS	ZE	NS	NS
NS	PS	ZE	NS	NS	NB
NB	ZE	NS	NS	NB	NB

Table.2 Fuzzy controller's information			
Fuzzy controllers	**Range**		
	Error	**Error Deviation**	**Output**
Outer dc voltage control loop	[-1,1]	[-0.001,0.001]	[-20,20]

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Outer reactive power control loop	[-1,1]	[-1,1]	[-10,10]
Supplementary damping controller	[-0.1,-0.1]	[-0.001,0.001]	[-1,1]
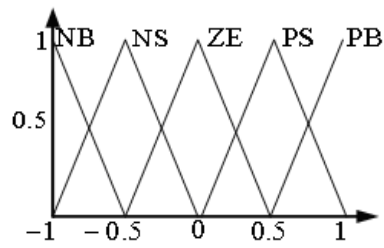
(a)
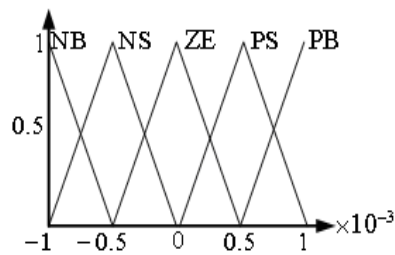
(b)

Fig.7 Membership functions for outer dc voltage control loop
(a) Error(b)Deviation Error
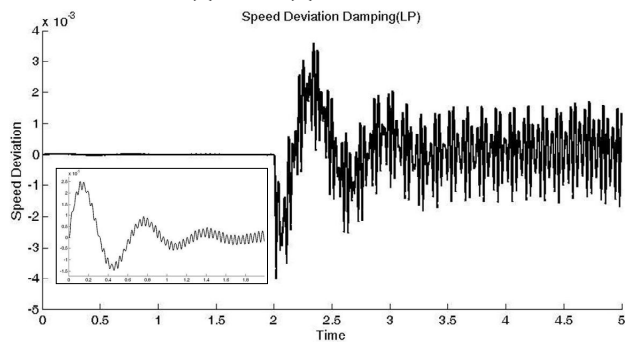
Fig.8. Generator Speed Deviation

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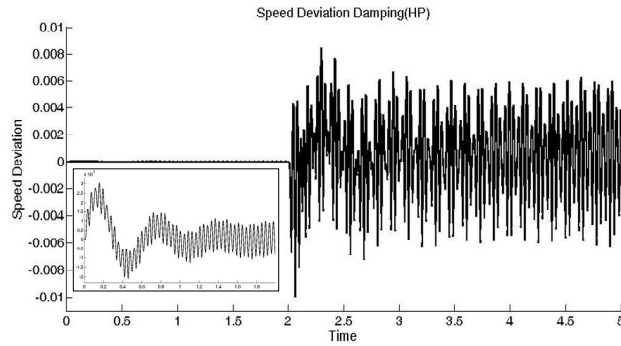
Fig.9. Low pressure turbine speed deviation
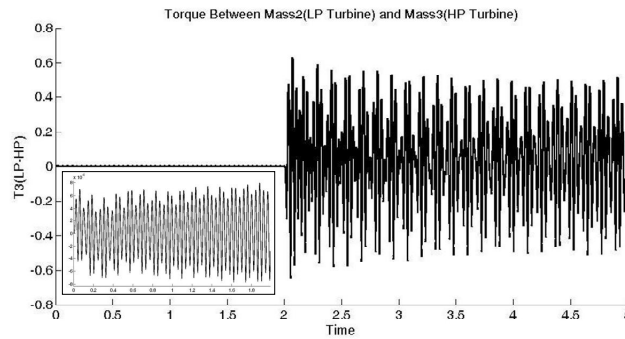
Fig.10. High pressure turbine speed deviation
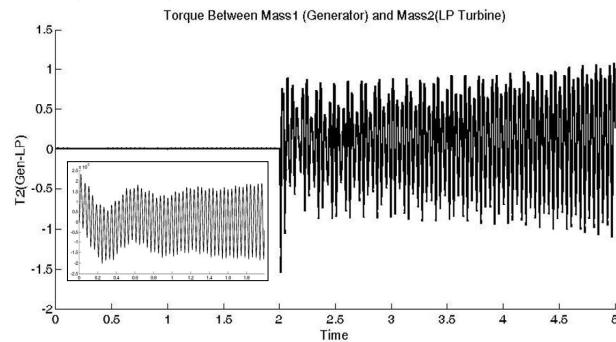
Fig.11. Torque between generator and low pressure turbine
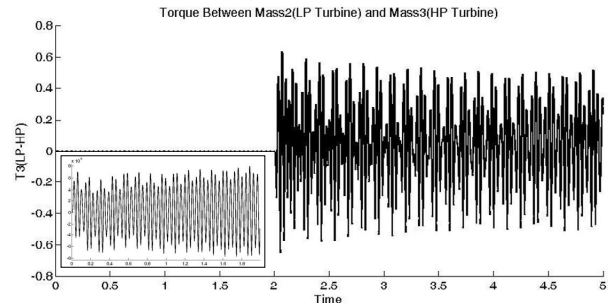
Fig.12 Torque between low pressure and high pressure turbine
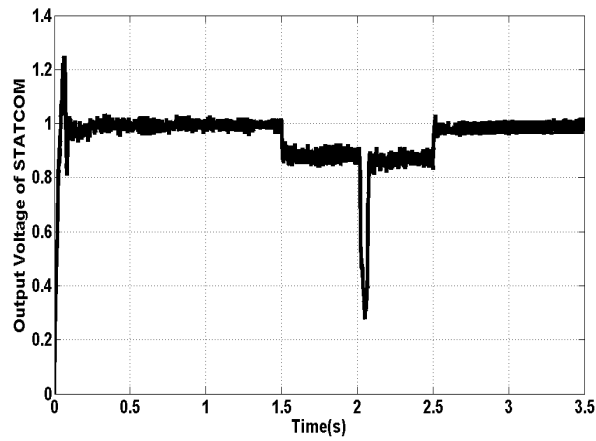
Fig.13.Output Voltage of STATCOM
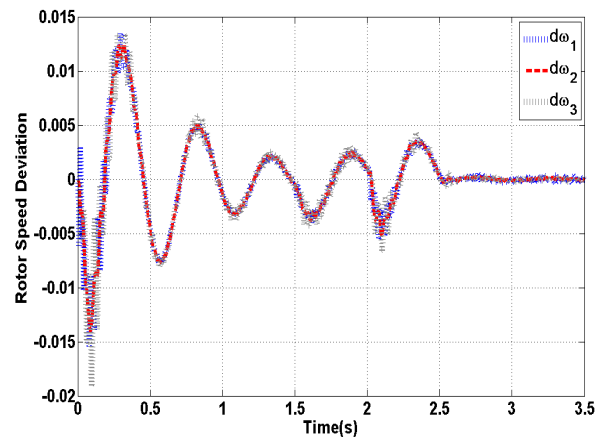
Fig.14.Rotor Speed Deviation
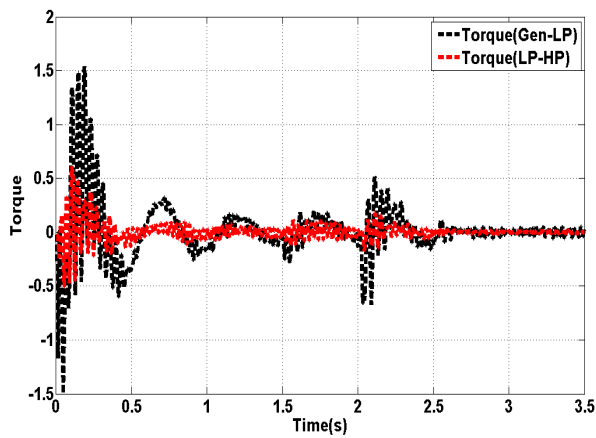
Fig.15.Torque Deviation in Rotor of SM

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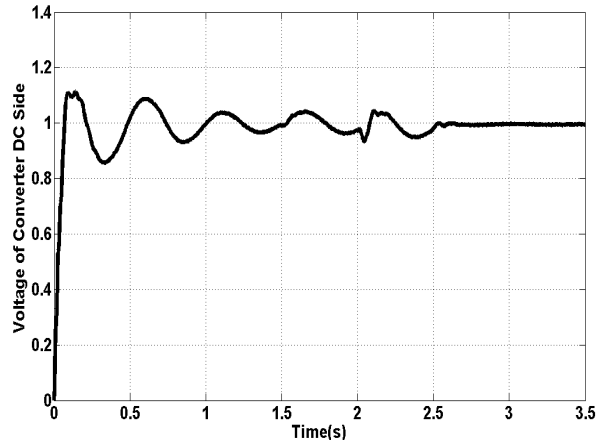
Fig.16.Voltage of DC Capacitor in STATCOM
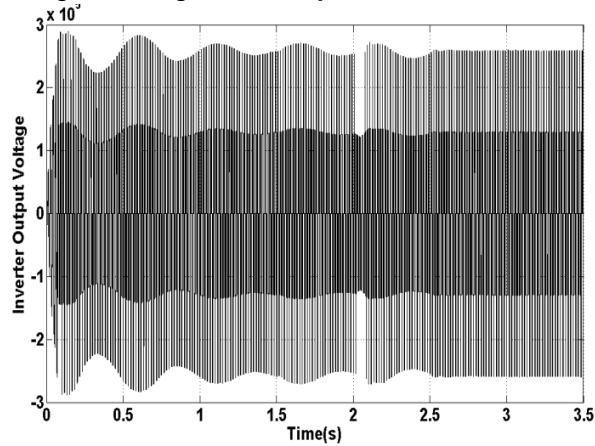
Fig.17.Inverter Output Voltage
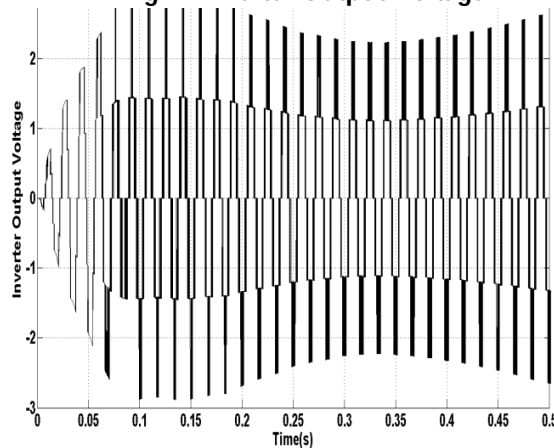
Fig.18. Inverter Output Voltage (0-0.5s)

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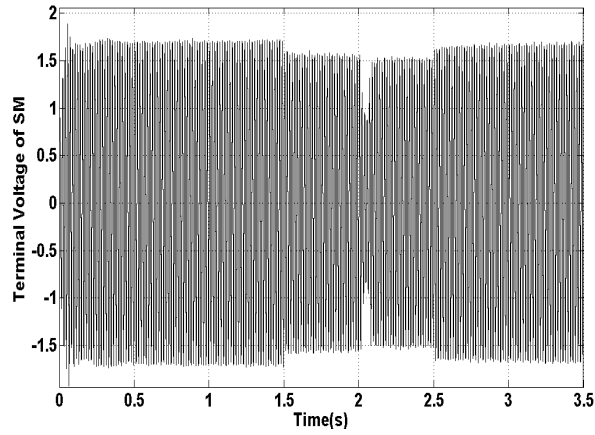
Fig.19.Terminal Voltage of SM
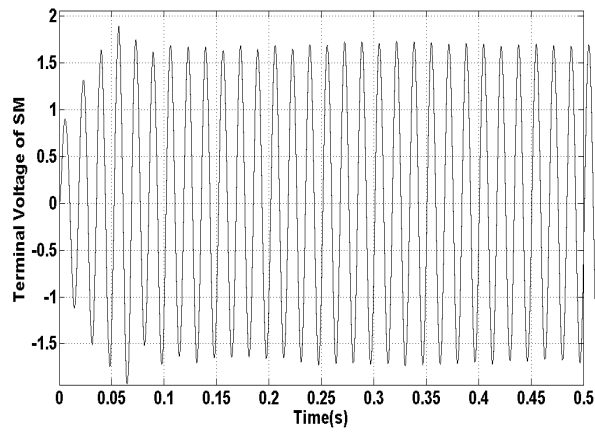
Fig.20.Terminal Voltage of SG(0-0.5)
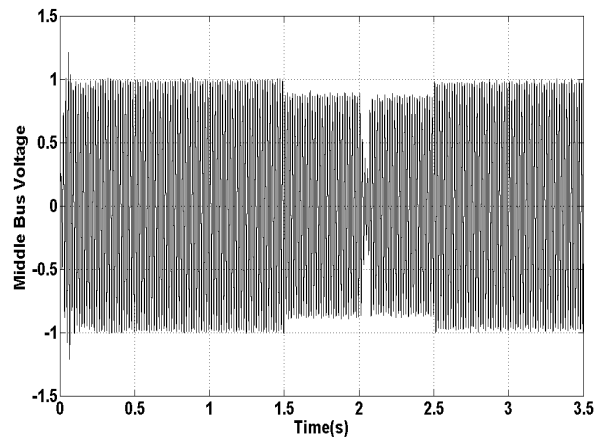
Fig.21.Middle Bus Voltage

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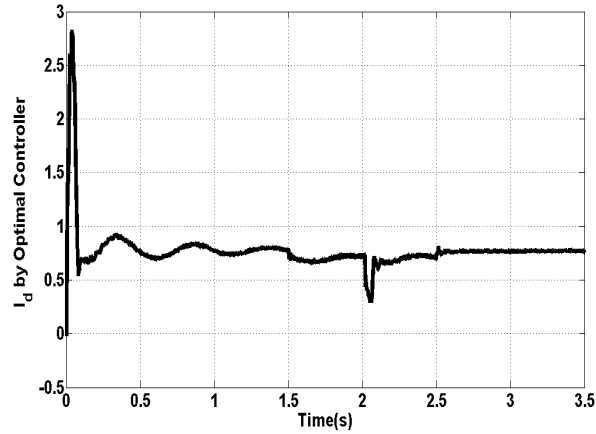
Fig.22.Active Component of LQR Controller
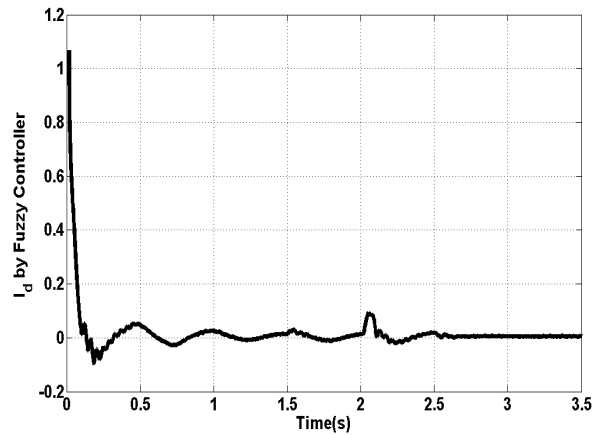
Fig.23.Active Component of Fuzzy Controller
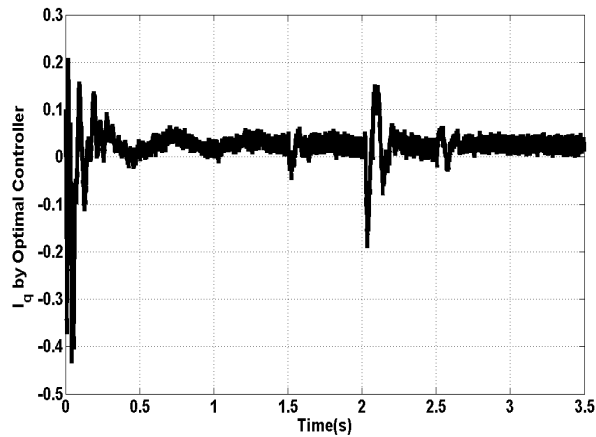
Fig.24.Reactive Component of LQR Controller

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Fig.24.Reactive Component of LQR Controller

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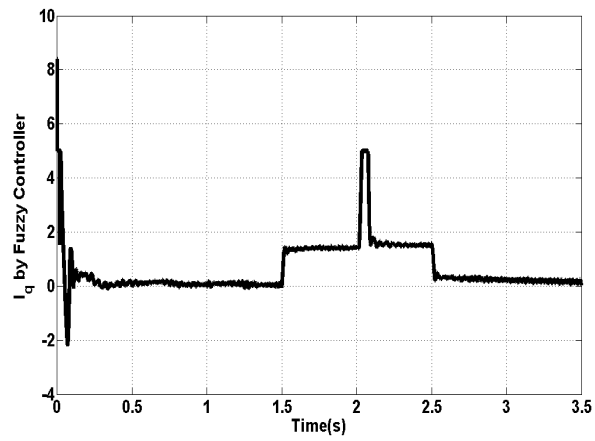
Liquid Crystals and Multiple Optical Bistability

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ABSTRACT

The transmission characteristic curve and the concept of feed-back which plays an essential role for the observation of optical bistability of the liquid crystal were experimentally investigated. The relaxation time, τ is $0.8 \pm 0.1 (s)$ of the liquid crystal and the viscosity γ is $0.0237 \pm 1.14\% (poise)$ of the cell were also determined from the experimental data is in good agreement with the theoretical estimate.

Key words : liquid crystal, optical bistability, viscosity.

INTRODUCTION

Liquid crystals have been known for over a century, but they have attracted major attention from all areas of science only in the last few decades. In particular there is considerable interest in bistable optical devices. This is because of the wide range of applications such as amplification, pulse shaping, optical switching and binary logic etc [1].Liquid crystals are materials which share the mechanical properties and the symmetry properties of solids and are anisotropic fluids. But unlike the ordinary fluids, the molecules of the liquid crystal have long-range orientational order. This means that the liquid does not suffer complete loss of fluidity. They can be categorized as the following:

   i.   Nematic
  ii.   Cholestic
 iii.   Smectic

In Nematic liquid crystals, the molecules are aligned in the same direction but randomly. In Cholestic and Smectic liquid crystals the molecules are aligned as well but in distinct layers; their long axes are parallel to Cholestic or

perpendicular to the Smectic planes of the layers. Of the three liquid crystal types Nematics have the largest rotatory power, are the least highly ordered and have the lowest viscosities-that is why they respond most easily to the applied fields than the other two.The molecules in the liquid crystal can align homogenously or homeotropically (see figure 1) and point along the director leads to a condition known as anisotropy, which means that the properties of materials depend on the direction [2, 3].

Since in this paper the homeotropic type of alignment is used, thus the concentration off course will be on this particular one. When a d.c voltage is applied such that the electric field is perpendicular to the average orientation of the molecules, the dielectric constant is $\varepsilon_\perp$. If an electric field is parallel to the average orientation of the molecules then the dielectric constant is $\varepsilon_\parallel$. If an electric field is applied in any intermediate case, the effective dielectric constant will be:

$$\varepsilon_{effective} = \varepsilon_\perp \varepsilon_\parallel / (\varepsilon_\parallel \sin^2\theta + \varepsilon_\perp \cos^2\theta) \tag{1}$$

where θ is the angle between the average orientation of the molecules and the applied field. These molecules are free to reorient in an applied field so only the induced polarization contributes to the refractive index at optical frequencies. This is because the structure of the liquid crystal is anisotropic. The dielectric anisotropy is given by:

$$\varepsilon_a = \varepsilon_\parallel - \varepsilon_\perp \tag{2}$$

where $\varepsilon_\parallel$ and $\varepsilon_\perp$ are the dielectric tensor elements and one could speak of positive and negative anisotropy depending on the sign of ε_a.

When $\varepsilon_a > 0$ and a voltage is applied in any direction, the molecules will tend to align along the field. Whereas if $\varepsilon_a < 0$ the molecules will tend to align perpendicularly to the applied electric field. A d.c voltage can break the Nematic order because impurities such as ions are accelerated by the field causing collisions. In order to avoid this effect, an a.c voltage must be applied and this will also align the molecules as these do not have a permanent dipole and will keep the ions immobile. Then the sample said to be stable.

Liquid crystals are birefringent, i. e there are two refractive indices $n_\parallel$ parallel and $n_\perp$ perpendicular which can be seen by the optical electric field. In this case liquid crystals behave like uniaxial crystals. If the field is polarized linearly in any direction it will emerge from the cell elliptically polarized. The difference for these refer active indices is given by:

$$\Delta n - n_\parallel - n_\perp \tag{3}$$

Consider the following case of a plane polarized incident beam with a crystal of negative anisotropy, the direction of the plate will be along and perpendicular to the optic axis, the vibration of the incident beam make angle θ with the optical axis. The amplitude of the E_s and E_f waves will be $A\sin\theta$ and $A\cos\theta$ where A is the amplitude of the incident light. When the coherent E_s and E_f disturbance emerge from the crystal, their perpendicular linear simple harmonic vibrations are superposed.

When $\theta = 0, \pi, 2\pi, \ldots$ etc, the resultant is linearly polarized. As θ is increased from zero the resultant becomes an elliptically polarized motion; as θ continues to increase it will become a circular motion until it reaches π or $n\pi$ where n is an integer. The resultant becomes linear again.

As we increase the bias voltage E_s and E_f propagate through the liquid crystal cell at different speeds. This is due to the birefringent behavior of the molecules in the liquid crystal which introduces a phase delay.Moreover, if a voltage is applied the torque on the molecules changes their orientation and thus the refractive index can also be changed and so the state of polarization of the light. When placed between cross polarizers, the transmission characteristic of the cell is given by:

$$T = \frac{I_{out}}{I_{in}} = sin^2\left\{ \pi n_\perp / 2\lambda [1 - n_\perp^2 / n_\parallel^2] \int_0^c sin^2\theta(z) dz \right\} \tag{3}$$

where the symbols have their usual meaning [2, 3].

Theory

Optical bistability describes the phenomena within a system which allows two stable output states to be displayed optically for the same input condition. In other words optical bistability can occur in an optical system in which there is a region of input intensities for which the output intensities have two stable values for given input intensities. The two values represent high and low transmitting states. With the system are associated two input intensities at which the system rapidly transforms from one state to the order which is referred to as switching and the appropriate input values are called the switch-up and switch-down input intensities. If the input is varied periodically, the transmission can be seen to trace a hysteresis loop [3].

From the definition, the optical bistability can be obtained from an electro-optic device whose transmission coefficient $T(V)$ has non-linear dependence on the applied voltage, V. then we have:

$$T(V) = \frac{I_{out}}{I_{in}} \tag{4}$$

where I_{out} is the output or transmitted intensity and I_{in} is the input or incident intensity. The optical output is detected and converted into a voltage, which is feedback across the device. Thus the applied voltage is:

$$V = V_b + \alpha I_{out} \tag{5}$$

$$I_{out} = (V - V_b)/\alpha \tag{6}$$

where V_b is the bias voltage independent of I_{out} and α. Where α is the conversion factor between the optical intensity and the feedback voltage. Substituting (6) into (4) we obtain:

$$T(V) = (V - V_b)/\alpha I_{in} \tag{7}$$

Equations (4) and (7) can be solved graphically see figure 4. At a suitable value of V_b the solution becomes bistable. In general if $dT/dV > T/V$ then I_{out} is a multivalued function of I_{in} for the suitable bias voltage, then bistability can be obtained. At a very high input the αI_{out} term begin to contribute to V. Thus increasing $T(V)$ and I_{out} when $(V - V_b)/\alpha I_{in}$ is a straight line which becomes a tangent to $T(V)$. The transmission passes through the peak transmission and comes to equilibrium at a lower $T(V)$. So equations (4) and (7) are satisfied. Once the input intensity is low then $dT/dV > T/(V - V_b)$ and the device turns OFF. Since the feedback voltage is proportional to the applied voltage, V one has optical bistability in a condition that $dT/dV < T/V$.

Experimental Set-up

The light source is a He-Ne laser with 10mW output power, which passes through a polarizer, and transmitted to the liquid crystal cell and into the second polarizer, and passes into the photo detector which is connected to an oscilloscope. The oscilloscopes monitor the actual intensity of the light which is transmitted from the system.The dashed-dotted rectangles in figure 5 refer to as BOX is in practice only one unit. It is an amplifies 5kHz small signal according to the voltage from the detector. So the amplification is proportional to the d.c signal from the detector. The resulting a.c voltage is in phase with the signal V_b from an oscillator and hence it simply adds up to it. Consequently the total rms voltage V applied to the liquid crystal is given by:

$$T(V) = V_b + \alpha V_d \tag{8}$$

where V_b is rms voltage from the oscillator, α is an amplifier's effective gain and V_d is the detector voltage. In the experiment a liquid crystal with negative anisotropy is used. For this reason an a.c voltage has been used which is essential for stability. In order to increase the field-induced birefrigent effect, crossed polarizers set 90° with respect to the surface molecular orientation, have been used. And finally the oscillator delivers a sinusoidal output waveform of frequency 5kHz [4].

Measurements

Transmission Characteristic Curve

Taking the voltage reading from the oscilloscope, a plot of V_d vs V_b has been obtained i.e. applied voltage V_b was varied (see graph 1). Increasing the voltage causes the effective dielectric permittivity and refractive index to change because the homeotropically aligned molecules in the liquid crystal cell rotate. This rotation will change's the polarization states of the light for example from the linearly polarized states to elliptically polarized states and then to circular. Obviously if there is no applied electric field then there is no effect to the molecules and they will be at state of rest. Note: an a.c voltage has been applied with no feedback [3, 5].

Optical Multi-Bistability

The time base of the oscilloscope was switched off and the output select knob was turned to the Amp+Osc position so that $V = V_b + \alpha V_d$ (i.e feedback) was applied to te liquid crystal cell. The oscillator amplitude was changed slowly from zero to maximum and then back to zero again. Graph 2 is hysteresis loop and graph 3 is very much similar to the transmission characteristic curve graph 1 but the second sets of reading results a slight shift back towards of the first sets of reading. The graph of the V_b against V_d were plotted see graph 3 [5].

Relaxation Time Of The Liquid Crystal Cell

The relaxation time of the liquid crystal cell is a time which takes to the molecules to go back to their original orientation before any electric field is applied. The relaxation time of the liquid crystal and viscosity γ can be obtained by the difference between t_1 and t_0 gives the relaxation time τ of the cell and is given by:

$$\tau = t_1 - t_0 \tag{9}$$

$$= d^2 \gamma / \pi^2 K = 0.8 \pm 0.1s \tag{10}$$

where d is the thickness of the cell, γ is the viscosity and K is the Frank's constant [4].

By taking the following values and using equation (10) the viscosity, γ can be obtained.

$$d = 0.1 cm$$
$$\tau = 0.8 s$$
$$K = 3 \times 10^{-7} dyn$$

Equation (10) in term of γ becomes:

$$\gamma = \frac{\tau \pi^2 K}{d^2} = 0.0237 \pm 1.14\% \text{noise} \tag{11}$$

DISCUSSION

Liquid crystal materials are categorized into three parts according to the orientational molecular structure. These are the Nematic, the Smectic and the Cholestic phases. The vector that shows the macroscopic direction of the molecules is called the director. The degree of alignments is described by an orientational order parameter, S which is defined by:

$$S = 1/2(3\cos^2\theta - 1)$$

where θ is the angle between the director and the axis of an individual molecule. When $S = 1$ the molecules align parallel to director, and when $S = 0$ they are entirely in random. For a homeotropically aligned liquid crystal cell the molecules parallel to chain or normal to the surface. With $\varepsilon_a < 0$ see equation (2) when the applied voltage is increased the director aligns perpendicularly with the field due to the applied voltage i.e a.c voltage. The liquid crystal is birefringent with two refractive indices $n_\perp$ (typically 1.5) $n_\parallel$ and (typically 1.7). It can be seen by the field depending on the value of the angle between the optical axis and the director as θ varies with applied voltage so will Δn see equation (3).

The transmission characteristic curve V_d vs V_b for the liquid crystal cell between crossed polarizers was obtained and found that there are two stable states at $V_b = 0.75 mV$ and $V_d = 1.04 mV$. As the applied voltage is increased from zero to maximum, the waves propagate through the cell at different speeds, which introduces a phase delay. The result of combining E_s, slow wave and E_f, the fast wave of the harmonic motion with same amplitude but different phase shift (see figure 2, 3). When θ is equal to odd and even multiple of π the result is linear vibration. When θ is equal to odd multiple of $\pi/2$ the result is circular vibration, $n\pi/2$ where $n = 1,3,5, ...$ etc, and when θ is equal to odd multiple of $\pi/4$ the results is elliptical vibration, $n\pi/4$ where $n = 1,3,5, ...$ etc. Using $V = V_b + \alpha V_d$ i.e feedback. Two sets of readings have been taken with $\alpha = 5$ and 10 by varying the voltage from zero to maximum and maximum back to zero see graph 2, 3. Finally it can be seen that the liquid crystal cell is sensitive to temperature, pressure, ... etc [6].

CONCLUSION

The aim of the paper was to understand the molecular behavior in the liquid crystal cell, which behaves differently as a voltage is applied in any direction in which the molecules tend to align along the applied field. Homeotropic

alignment of a Nematic occurs when the molecules long axis are perpendicular to the plane of the aligning surface. The transmission characteristic curve was found by varying the oscillator amplitude from minimum to maximum and found to be oscillatory (see graph 1). The liquid crystal cell was also used to study the optical bistability which occurs in optical system which allow two stable output states to be displayed optically for the same input condition. The variation of the input intensity back and forth between minimum and maximum results in a hysteresis loop, (see graph 2). Finally the relaxation time τ and the viscosity γ were found to be $0.8 \pm 0.1 \ second$ and $0.0237 + 1.14\% \ poise$ respectively.

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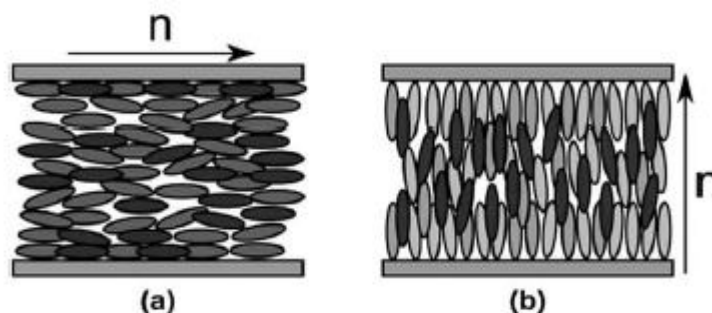6. Lloyd AD. Optical Bistability in Nematic Liquid Crystal. Theses Collection 1989; 16-30.
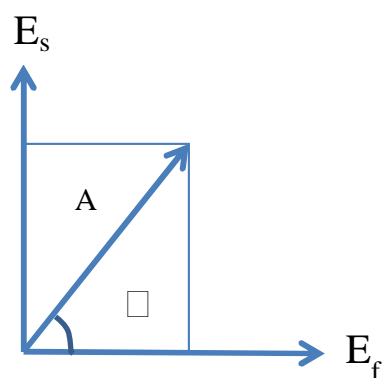
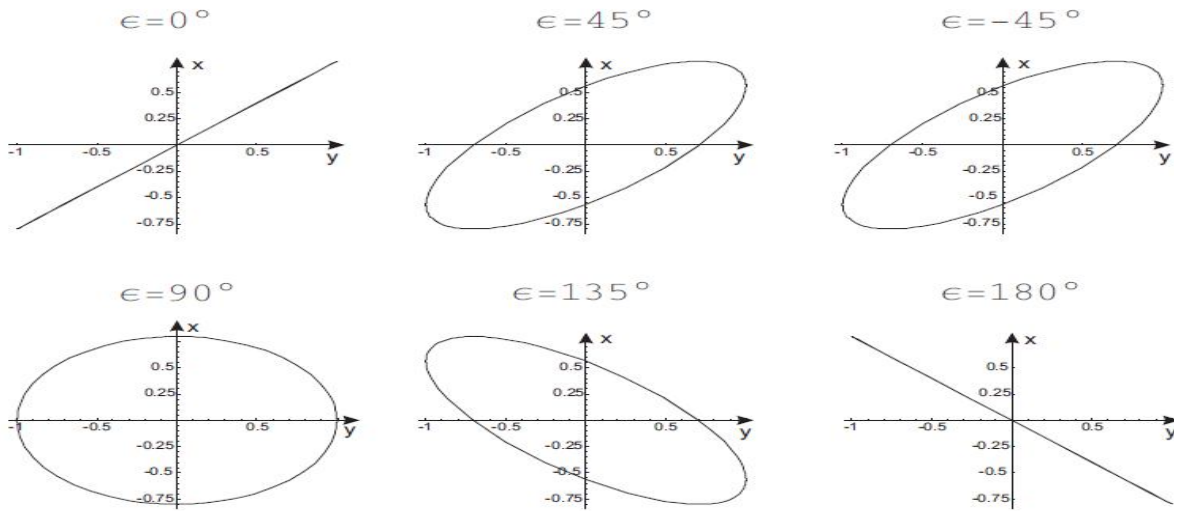**Figure. 1**

Figure. 2

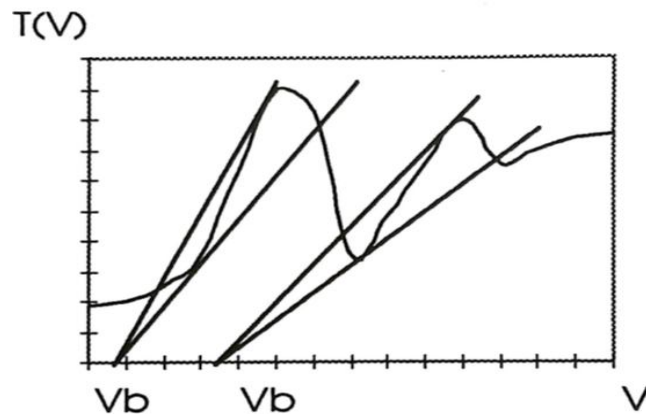**Figure. 3 The states of polarization of light which passes through the liquid Crystal plate.**

Figure. 4 Graphical representation of transmission with feedback for given values of voltage.
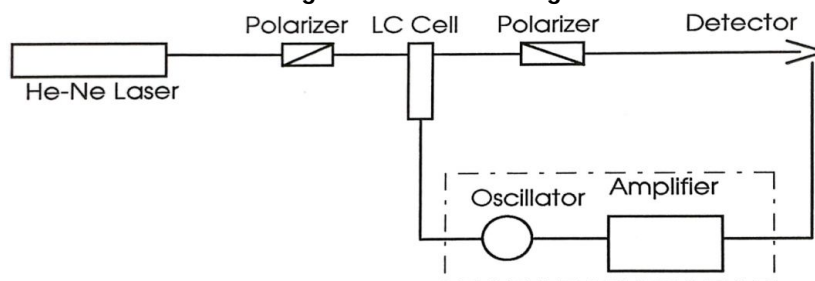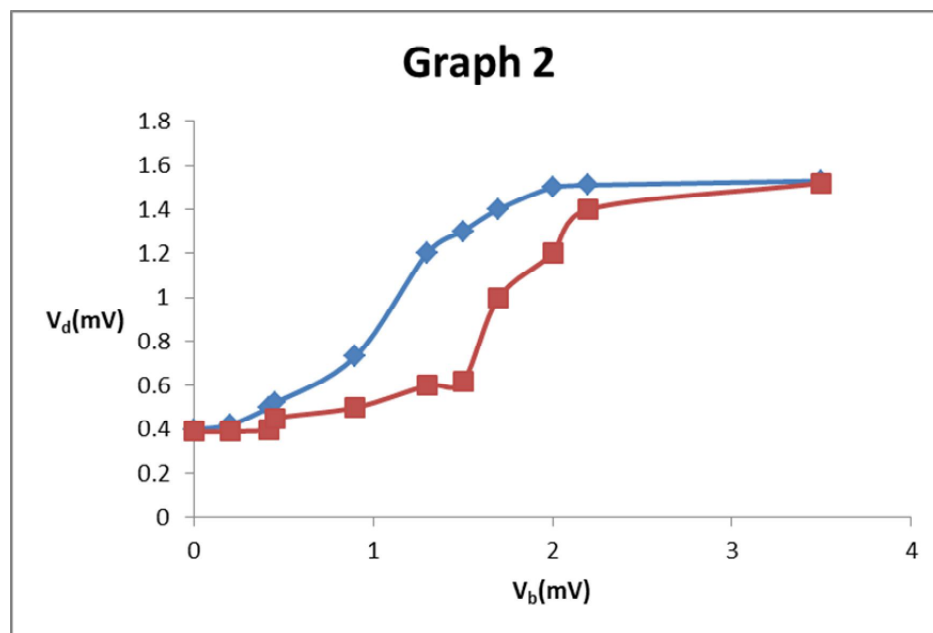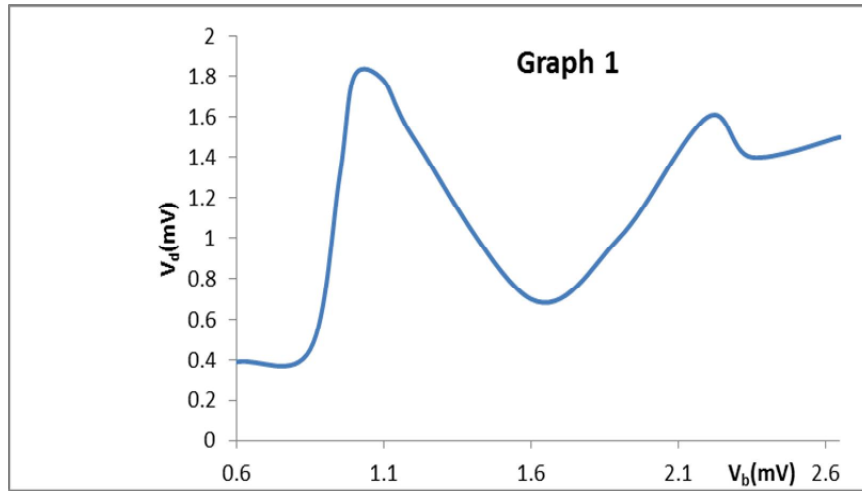

Figure. 5

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