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Journal of Modern Psychology

Research Paper: The Effect of Self-Controlled Feedback on Motor Performance and Learning in Adolescents with ADHD

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Abstract

The aim of this study was to investigate the effect of autonomy support (i.e., in the form of self-controlled feedback) on learning and self-efficacy in a throwing skill in adolescents with ADHD. The subjects were 40 adolescents with ADHD (14 to 17 years old) and were randomly and equally divided into two groups: self-controlled and yoked. Motor task included to throw beanbags with the non-dominant arm at a target on the ground. The participants executed the pretest (10 trials), an acquisition phase including 6 blocks of 10 trials, and a retention test consisting of 10 trials. The participants in the self-controlled group received KR anytime the requested. The yoked group was matched with self-controlled group, but without having a choice to request for feedback. Prior to pretest, each block, and before the retention test, all participants completed the self-efficacy scale. Dependent measures were throwing accuracy scores and self-efficacy. Independent t test and analysis of variance (ANOVA) with repeated measures were used to analyze the data. The results showed that participants in the self-controlled group had significantly higher throwing accuracy scores in the acquisition phase and the retention test than those in yoked group. Moreover, participants in the self-controlled group reported significantly higher self-efficacy scores in the acquisition phase and the retention test than those in yoked group. The results of this study show that people with ADHD benefit from autonomy support to learn a novel motor skill.

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1. Introduction

There are various strategies for teaching new motor skills. Some of them included watching a video model (Baniasad et al, 2022; Mokhtari et al, 2007; Ghorbani & Bund, 2014; Ghorbani et al. 2020), mental practice (Afsanepourak et al., 2012), self-talk (Baniasad et al., 2022), and focus of attention (Ghorbani et al., 2020; Baniasadi et al., 2018, 2019). A recent theory that has received particular attention in the field of motor performance and learning of new motor skills is the OPTIMAL (optimizing performance through intrinsic motivation and attention for learning) theory (Wulf & Lewthwaite, 2016), which shows the important role of motivational and attentional variables in the optimal performance and learning of motor skills. In this theory, the influential variables are included a) enhancing expectancies for future performance, b) supporting learners' autonomy and (c) promoting an external focus of attention (Wulf & Lewthwaite, 2016). In the present study, we focused on the effects of autonomy support on motor performance and leaning. In the OPTIMAL theory, autonomy support refers to situations in which a person is allowed to control or choose some aspects of performance conditions. Several studies have tested the effects of the autonomy support on optimizing the motor skills and found that it positively affects performance and learning in a variety of motor tasks and across a range of age groups (Abdoshahi et al. 2022; Chiviacowsky, 2014; Chiviacowsky & Wulf 2002, 2007; Chiviacowsky et al. 2008, 2009; Ghorbani & Bund, 2020; Wulf et al. 2014, 2017). Moreover, it has been suggested that autonomy support and learners' expectancies are operationalized by the self-efficacy construct. Self-efficacy is generally defined as one's belief in one's ability to succeed in specific situations or to execute a task (Bandura, 1977; Dana, Hamzeh Sabzi, & Gozalzadeh, 2017). However, the autonomy support has received less attention in the attention deficit hyperactivity disorder (ADHD) population. Hence, the effects of autonomy support on the performance of learning of new motor skills in individuals with ADHD have rarely been investigated. ADHD is a common neurodevelopment disorders among children that can persist into adolescence and adulthood. It is associated with an ongoing pattern of inattention, hyperactivity, and/or impulsivity. Symptoms of ADHD can interfere with daily activities and relationships. It is also associated with a high rate of psychiatric problems such as mood and anxiety disorders, and cigarette and substance use disorders (Dana, Rafiee, Soltan Ahmadi, Sabzi, 2018; Eskandarnejad, Mobayen, & Dana, 2015; Farhangnia, Hassanzadeh, Ghorbani, 2020). It has been shown that people with ADHD often have learning difficulties. Therefore, it can be expected that the performance and learning of motor skills in people with ADHD will be associated with challenges. Therefore, due to the lack of research data on the use of autonomy support in improving the performance and motor learning of people with ADHD, the aim of this study was to investigate the effect of autonomy support (i.e., in the form of self-controlled feedback) on learning a throwing skill in adolescents with ADHD. In the literature, Chiviacowsky and Wulf (2002) and Chiviacowsky et al, (2008) found that

autonomy support benefits performance in a sequential timing task and a throwing skill, respectively. Furthermore, Chiviacowsky (2014) found that participants of autonomy group reported greater self-efficacy at the end of the practice than yoked group. Wulf et al. (2014) demonstrated that autonomy support leads to higher self-efficacy than the yoked group. Thus, in the present study, it was hypothesized that exposing to self-controlled feedback would result in greater motor performance and learning as well as higher self-efficacy then yoked condition among adolescents with ADHD.

2. Method

The present study applied a causal-comparative method. The subjects of this study were 40 adolescents with ADHD in the age range of 14 to 17 years and were randomly and equally divided into two groups: self-controlled and yoked.

Motor task: Motor task in the present study included to throw beanbags with the non-dominant arm at a target on the ground. At the center of the target, there was a circle with a radius of 10 cm. The distance between the participant and the center of the target was three meters. Around the center of the target there were concentric circles with radiuses of 20, 30, 40, 50, 60, 70, 80, 90, and 100 cm. These circles were used to determine the accuracy of the throws. If the beanbag landed in the center of the target, then the score was 100. If it landed in one of the other circles, then the score was 90, 80, 70, 60, 50, 40, 30, 20, or 10 points, respectively. Finally, if it landed outside the circle, then a score of 0 was recorded.

Procedure: Participants were tested individually on two consecutive days. Prior to data collection, participants were given general information about the experimental procedure and asked to complete a questionnaire regarding information such as age, laterality, and previous experiences with motor task. Finally, participants were given brief instructions about the beanbag throwing task, which consisted of holding the beanbag with the non-dominant hand and throwing it at the target. To perform the protocol, the participants first executed the pretest, including 10 trials. During the acquisition phase, participants performed 6 blocks of 10 trials each, and one day later, they completed the retention test, consisting of 10 trials each without knowledge of result (KR). The participants were allowed to look at the target before each block, but during the pretest, practice, and retention phases they were prevented from viewing the outcomes by wearing opaque swimming goggles. To add autonomy support in the protocol, the participants in the self-controlled group received KR anytime the requested. It included the number of attempts, the score, and the direction of the landing relative to the center of the target. That is, if the beanbag landed in the upper part of the target, then a plus sign was added to the throwing score (e.g., +50). Conversely, if the beanbag landed in the lower part of the target, then a minus sign was presented before the throwing score (e.g., -50). Therefore, KR included information about the result's distance from the center of the target, as well as information about the direction of the error. The yoked group was matched with self-controlled group, but without having a choice to request for feedback. The participants were given six seconds to

execute each throw. Time was measured with a digital chronometer. Prior to pretest, each block, and before the retention test, all participants completed the self-efficacy scale, in which they were asked to rate how confident they were, on a scale ranging from 10 (*not confident*) to 100 (*absolutely confident*), that they would be able to throw the beanbag at a target (i.e., a score of 100) on one of the following trials.

Data analysis: In the present study, the dependent variable included throw accuracy and self-efficacy in pre-test, acquisition phase, and retention test. Independent t test was used to analyze the research variables in pre-test and retention test. Analysis of variance (ANOVA) with repeated measures was used to analyze the data in the acquisition phase. The level of statistical significance was used at P <0.05.

3. Results

Figure 1 shows the accuracy scores across the pretest, acquisition phase, and the retention test.

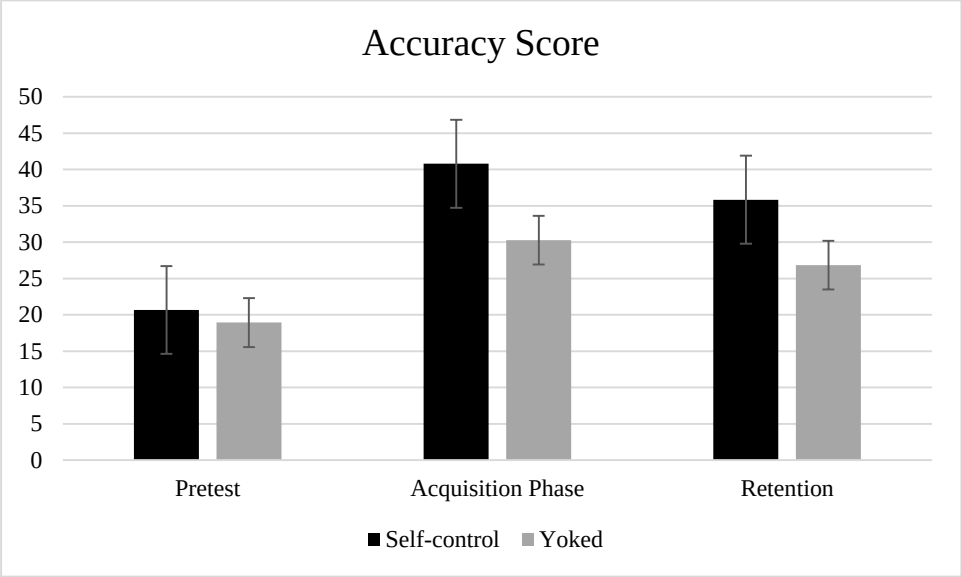
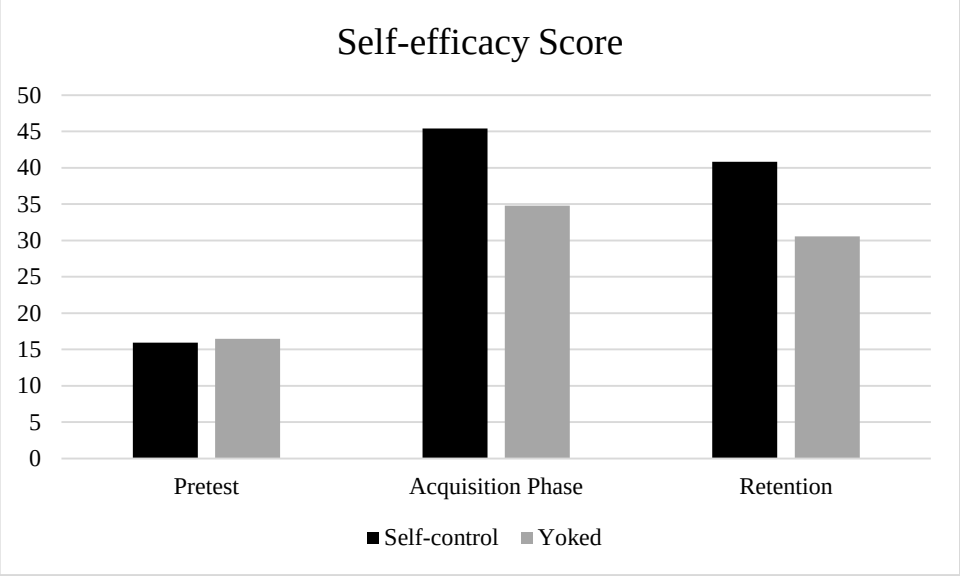


Figure 1. Accuracy scores across the pretest, acquisition phase, and the retention test.

The analysis of the pretest showed no significant differences between groups, t = 0.48, p = 0.56. This shows that both groups had identical condition before engaging in the protocol. During the acquisition phase, the performances of both groups improved significantly, F = 5.11, p = 0.000, η^2 = 0.12. Moreover, self-controlled group performed significantly better than yoked group, F = 6.73, p = 0.000, η^2 = 0.19. Finally, the data from the retention test indicated that self-controlled group performed significantly better than yoked group, t = 4.61, p = 0.000. Figure 2 presents the Self-efficacy scores across the pretest, acquisition phase and the retention test.



The analysis of the pretest showed no significant differences between groups, t = 0.24, p = 0.71. This shows that both groups had identical condition before engaging in the protocol. During the acquisition phase, the self-efficacy scores of both groups improved significantly, F = 6.41, p = 0.000, η^2 = 0.15. Moreover, self-controlled group reported significantly higher scores than yoked group, F = 8.69, p = 0.000, η^2 = 0.26. Finally, the data from the retention test indicated that self-controlled group reported significantly higher scores than yoked group, t = 8.83, p = 0.000.

4. Discussion

Due to the lack of research data on the use of autonomy support in improving the performance and motor learning of people with ADHD, the aim of this study was to investigate the effect of autonomy support (i.e., in the form of self-controlled feedback) on learning and self-efficacy in a throwing skill in adolescents with ADHD. We hypothesized that exposing to self-controlled feedback would result in greater motor performance and learning as well as higher self-efficacy among adolescents with ADHD. As expected, the results demonstrated that self-control practice led to significantly higher accuracy scores in both acquisition phase and the retention test than the yoked condition. That is, giving individuals with ADHD a choice to control practice condition resulted in higher motor performance and learning in comparison to yoked group. The results of the present experiment are in accordance with those of previous studies on healthy individuals (Chiviacowsky, 2014; Chiviacowsky & Wulf 2002, 2007; Chiviacowsky et al. 2008, 2009; Ghorbani & Bund, 2020; Wulf et al. 2014, 2017) indicating that autonomy support was clearly beneficial for motor learning in individuals with ADHD.

Interestingly, the self-control condition had beneficial effects on self-efficacy. Such results demonstrated that the self-control group reported significantly higher self-efficacy scores in the acquisition phase, and retention test than the yoked group. The findings generalize prediction of the OPTIMAL theory that autonomy would affect motivational states such as self-efficacy in individuals with ADHD (Wulf

& Lewthwaite, 2016). The results also are in accordance with the results of previous studies (Chiviacowsky, 2014; Chiviacowsky & Wulf 2002, Chiviacowsky et al., 2008; Ghorbani & Bund, 2020; Wulf et al., 2014). Present findings indicate that autonomy support has clearly increased motivation during practice and it remained at a high level in no-KR retention condition, while that was not the case for yoked group. To interprets these finding, it can be stated that in the OPTIMAL theory, it is assumed that autonomy support facilitates motor learning by making dopamine available for memory consolidation and neural pathway development and contribute to efficient goal-action coupling by preparing the motor system for task execution (Wulf & Lewthwaite, 2016). There is some evidence that feedback frequency may effect on motor learning in children with special needs (Kordi et al., 2017). So this issue should be considered in findings justification.

5. Conclusion

These results are important for practical settings, too. According to the benefits of self-control practice for enhancing self-efficacy and motor learning, it can be used as an effective method for teaching new motor skills to novices with ADHD. According to the OPTIMAL theory, enhanced intrinsic motivation and motor learning can be expected for individuals who were given a choice to control the training conditions.

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Conflict of interest

The Authors declare that there is no conflict of interest with any organization.

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Research Paper: Self-harm Behavior among University Students

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Abstract

The aim of this study was to investigate the frequency of self-harm behaviors in University Students. The statistical population of this descriptive study includes the entire undergraduate students of the University of Guilan who have been studying at this university un the academic year 2019-20. Participants in the research were 508 students (368 females and 140 males) who were randomly selected among the students. For data collection, the self-harm questionnaire of Sanson et al. (1998) and to analyze them, descriptive statistics methods and chi-square test were used. According to the findings, 17.8% of the students have self-harm behaviors. The results of Chi-square test showed that there is no difference between male and female students in terms of the frequency of direct, indirect and general self-harm behaviors. (P> 0.01). But burning the body, Recklessness in driving, alcohol abuse and Deliberate loss of job in male students, and involved in relationships that expose one to sexual abuse and Deliberate self-starvation were more common in female students. (p< 0.01). Also, local and non-indigenous university students and different age groups of students were significant different in terms of acts of self-harm and indirect self-harm. (P< 0.01). Based on the findings, it can be stated that self-harm is a relatively common behavior in university students. As a result, these people need to be identified and treated in a timely manner to reduce the negative consequences of these behaviors.

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1. Introduction

Self-harm behavior including inflicting any sort of intentional or deliberate injury on oneself, such as cutting different parts of the body with sharp-edged tools or burning them (National Alliance on Mental Illness, 2020), has captured the attention of numerous researchers in the recent years as one of the major health crises involving adolescents and young people (Auerbach et al., 2020). One of the most significant categorizations of the self-harm behavior is the one done by Favazza and Simon (1996) who have categorized self-harm into four groups. One of the rarest sorts of these behavior is major self-harm including mutilation and removal of eyes. Stereotypical self-harm includes a pattern of unchanging, rhythmic and inadvertent actions such as smashing one's head against the wall and biting nails, which mostly exists in individuals with chronic mental disorders and children with autism. Obsessive self-harm consists of any behavior such as scratching the skin and pulling nails. Impulsive self-harm is the most frequent and varied type of self-harm, which includes cutting, scratching, burning the skin, pulling the wounds, injecting liquids, punching and clawing oneself, which is the most prevalent type of self-harm in youths (Favazza & Simmon, 1996, as cited in Favazza, 2006).

Students are sensitive in terms of mental health, and some of them experience at least one of these challenges, leading to their poor academic performance (Bruffaerts et al., 2018). Self-harm is one of the problems damaging the mental health, which affects university students (Vidourek, 2018). Results from studies investigating the frequency of self-harm behavior among university students exhibit prevalence rates varying from 2.5 %to 42.5 % (Labouliere, 2009; Taliaferro & Muehlenkamp, 2015). According to these results, it can be inferred that self-harm is common and on the rise habit among university students (Taliaferro & Muehlenkamp, 2015; Griffin et al., 2021). At least, one out of every 20 students engage in self-harm and 6 % of these students are inflicted with serious and chronic self-harm behavior including cutting or scratching their body and the rest have a background of self-harm behavior (Vidourek, 2018; Whitlock, 2012). In Iran, the highest prevalence rate of self-harm behavior is found to be 40.5 % in a study conducted on the students of Islamic Azad University, Babol Branch (Nobakht & Yngvar, 2017).

Self-harm, more common among the freshman and undergraduates, might decline in higher levels of education, but if it does not, it becomes more chronic as the individuals age, bringing with it greater maladies (Taliaferro & Muehlenkamp, 2015; Lang & Sharma-Patel, 2011). Overall, students face a variety of challenges in the early years of academic education due to exposure to a new environment; providing they had already had backgrounds of depression and anxiety, it is probable that they would not be able to confront these challenges and to adapt to the new setting and people, setting the stage for the emergence of self-harm behavior (Taliaferro & Muehlenkamp, 2015; Hilton, 2017). Incapability to confront anxieties resulting from running into new and complex challenges prompts the individual to look for alternative methods to get consolation and mitigate stress, and in case of engaging in self-harm, they will be

temporarily pacified. As a result, they continually use this practice as a mechanism for confronting difficult situations, and this repeated use aggravates self-harm (The National Alliance on Mental Illness, 2020). Among the other reasons students inflect self-harm on themselves is confronting negative, excessive emotions and sentiments which they fail to regulate and try to gain control over the emotions (Hilton, 2017). According to Klonsky (2007), when facing excessive negative emotions, the individual doing self-harm fails to regulate their emotions and as a result they recourse to self-harm as a method to express and control negative emotions and to get out of extreme negative emotional states (Suyemoto, 1994). When an individual comes to use self-harm as a method of confronting and regulating maladaptive emotions and finds it to be effective, the utilization of other methods would be minimized and with time, self-harm appears to be the only effective method; since such behavior is addictive, it becomes more chronic on a daily basis (Labouliere, 2009; Mental Health America, 2020).

Problems in interpersonal relationships, and failure to address them, represent one of the other reasons these individuals engage in self-harm (Burke et al., 2008). Based on the social model of self-harm, when an individual lacks the capability to initiate healthy relationships with people and cannot communicate with them successfully, they resort to self-harm as a means of doing so. Through this behavior, people inflict self-harm on themselves to capture the attention of the others and attempt to walk away from the state of isolation while demonstrating their capability and power to them (Klonsky, 2007; Nock, 2008).

Self-harm behavior entails significant problems and ailment for the body and soul of an individual and affect their family, friends and the society, underscoring the importance of investigating such behavior (Nock, 2010; Xavier et al., 2016). Self-harm is a latent behavior simmering beneath the skin of the society, which is progressively aggravated due to not receiving timely assistance and treatment. The treatment of self-harm behavior becomes more complicated and difficult as the person ages. Moreover, it is possible that youths encourage each other to exhibit such behavior, and for the same reason, it is important that the extent and intensity of the occurrence of such behavior in the society are investigated so as to presage the preparation of effective preventive plans (The National Alliance on Mental Illness, 2020; Lang & sharma-patel, 2011; Izakian et al., 2017). On the other hand, the use of self-harm behavior as a negative coping strategy result in the decline of the academic performance of the students and it might even lead to them failing their courses in higher levels of education (Mental Health America, 2020; Hjorth et al., 2016). Studies reveal a high degree of self-criticism and self-loathing among the students (Smith et al., 2020). Poor academic performance and failure in educational development contribute to the building up of self-assessment and self-criticism of these individuals, and as a result the resurge of self-harm (Wiseman, 2017). Self-harm behavior leads to the squandering of suitable opportunities for the growth of the individual which has a negative impact on their occupational

prospects and their efficiency within the workplace (The National Alliance on Mental Illness, 2020). Since students play a key role in the progress of a society in economic, social and cultural terms, any sort of harm on their body or soul hinders the progress of the society, incurring considerable costs for the economy and health sector of a country (Aliverdinia et al., 2012; Bruffaerts, et al., 2019)

There are limited studies on self-harm behavior in Iran and other Asian nations (Gholamrezaei et al., 2017; Wu et al., 2011) and this specific area has been neglected. Therefore, it can be stated that there is an information gap when it comes to the prevalence and grounds of emergence of self-harm behavior in general, and among the students in particular, and conducting any research in this regard in Iran would be significant. The present study is conducted with the aim of investigating the frequency of occurrence of self-harm behavior among the university students in Iran.

2. Method

The present study has a descriptive design. The population of the study includes the entire undergraduate students of the University of Guilan who were studying at this university in the academic year 2019-20. The participants of the present research are comprised of 508 students of the University of Guilan (368 females and 140 males) who were selected from the students of the Faculty of Literature and Humanities, Faculty of Engineering, and Faculty of Arts and Architecture using convenience sampling. Criteria for being included in the present study were age (18-25), level of study (undergraduate) and voluntary consent .Criteria for exclusion from the research was unwillingness to fill out the questionnaire. The following questionnaire was employed for data collection:

The revised version of the Self-harm Inventory Questionnaire: This questionnaire, designed by Sanson et al. (1998), has 22 items for measuring direct (cutting, hitting, and burning) and indirect self-harming behavior (using illicit drugs, alcohol, and taking drugs). It was constructed to be used on psychiatric and non-psychiatric populations (Sansone et al., 1998). Psychometric properties of this questionnaire with a cut-off score of 5 were evaluated and reported as desirable outside of Iran. The internal consistency reliability coefficient of this scale was 0.74 in Cronbach's alpha test (Sansone et al., 2018). Furthermore, the convergent validity of this questionnaire with the self-destruct variable was evaluated and its correlation coefficient was 0.66, which was significant at the level of 0.01 (Wilkinson et al., 2018). Khanipour et al. (2018) reported the reliability coefficient of this questionnaire by Cronbach's alpha method (α= 0.81).

The first step in data collection procedure was to obtain necessary permits from the University of Guilan. After collecting the demographic details, the Faculty of Literature and Humanities, Faculty of Engineering, and Faculty of Arts and Architecture were selected in which to conduct the research. Afterward, several classes were picked from each faculty. Before distributing the questionnaires, the researchers gave students the explanations about the confidentiality of the results of the study and the need for truthful answering of the questions. Then, the relevant questionnaire was handed out to

the participants. The data collection took approximately three months. Out of the 518 filled out questionnaires, 10 questionnaires were incomplete, which were eliminated from the research.

Eventually, the collected data were analyzed using descriptive statistic methods (frequency and percentage) and Chi-square test.

3. Results

The average and standard deviation of the age of participants in the research was calculated to be 20.74 ± 1.93. By the order of birth, 36.4 % of the subjects were the first children, 37.6 % were the second children, 11.2 % were the third children and 14.8 % were the fourth children or more. Additionally, 63.2 % of the respondents were local and 36.8 % were non-local students. Moreover, 7.9 % of the respondents had the history of being on academic probation while 92.1 % didn't have the history of academic probation. Meanwhile, 72.4 % of the participants in the research were female and 27.6 % were male.

In Table 1, the distribution of the frequency of occurrence and percentage of the prevalence of self-harm among the students are given on the basis of gender.

Table 1

Distribution of the frequency of occurrence and percentage of the prevalence of self-harm among the university students based on gender

Self-harm	Gender	Frequency	Percentage	Chi-square test	P	Contingency coefficient
Indirect	Female	72	19.6	2.291	0.13	0.067
	Male	36	25.7			
	Total	108	21.3			
Direct	Female	30	8.2	0.15	0.7	0.017
	Male	10	7.1			
	Total	40	7.9			
Total	Female	65	17.7	0.96	0.96	0.002
	Male	25	17.9			
	Total	90	17.8			

According to Table 1, 17.7 % of the female students, 17.9 % of the male students and 17.8 % of all students inflicted self-harm on themselves. Moreover, 19.6 % of the female students, 25.7 % of the male students and 21.3 % of all students were engaged in indirect self-harm while 8.2 % of female students, 7.1 % of male students and 7.9 % of all students engage in direct self-harm. The results of the Chi-square test reveal that there was no significant difference between female and male university students in terms of the frequency of occurrence of self-harming behavior ($P<0.05$).

In the Table 2, the frequency of occurrence of a variety of self-harm behavior among male and female students and all students are tabulated.

Table 2

The frequency of occurrence of various self-harming behavior based on gender

Questions	Female		Male		Total		Chi-square	P
	Frequency	Percent	Frequency	Percent	Frequency	Percent		
Drug overdose	19	5.2	7	5	26	5.1	0.006	0.94
Cutting/wounding	40	10.9	9	6.4	49	9.6	2.29	0.13
Burning the body	6	1.6	9	6.4	15	3	8.14	0.04
Self-hitting	57	15.5	19	13.6	76	15	0.293	0.58
Banging the head	35	9.5	21	15	56	11	3.08	0.07
Alcohol abuse	16	4.3	25	17.9	41	8.1	24.94	0.00
Recklessness in driving	17	4.6	26	18.6	43	8.5	25.47	0.01
Scratching/clawing	37	10.1	10	7.1	47	9.3	1.02	0.31
Preventing the healing of wounds	27	7.3	12	8.6	39	7.7	0.218	0.64
Worsening physical conditions	34	9.2	6	4.3	40	7.9	3.43	0.06
Promiscuousness	11	3	6	4.3	17	3.3	0.52	0.46
Being in a relationship to get rejected	57	15.5	29	20.7	86	16.9	1.96	0.16
Abusing prescribed medicine	22	6	13	9.3	35	6.9	1.72	0.18
Deliberate distancing from God	46	12.5	23	16.4	69	13.6	1.33	0.24
Emotionally abusive relationships	73	19.8	32	22.9	105	20.7	0.56	0.45
Sexually abusive relationships	29	7.9	4	2.9	33	6.5	4.21	0.04
Deliberate loss of job	33	9	23	16.4	56	11	5.75	0.01
Suicide attempt	20	5.4	4	2.9	24	4.7	1.49	0.22
Exercising an injury	23	6.3	11	7.9	34	6.7	0.41	0.51
Self-defeating thoughts	178	48.4	59	42.1	237	46.7	1.58	0.20
Deliberate starvation	66	17.9	11	7.9	77	15.2	8.009	0.01
Laxative abuse	6	1.6	3	2.1	9	1.8	0.153	0.69

Table 2 highlighted that there was a significant difference between the female and male students in terms of burning their body, excess in alcohol abuse, deliberate recklessness in driving, sexually abusive relationships, deliberate loss of job and deliberate starvation (P<0.05). Male students burned their bodies more than female students (6.4 % against 1.6 percent), overindulged more in drinking alcohol (17.9 % against 4.3 percent) and drove more recklessly (18.6 % against 4.6 percent). In addition, they deliberately lost their jobs more (16.4 % against 9 percent). However, female students were more inclined to get involved in relationships that expose them to sexual abuse (7.9 % against 2.9 percent), like molestation, starve themselves more (17.9 % against 7.9 percent).

Table 3

Distribution of the frequency and percentage of the prevalence of self-harm among students based on their local/non-local status

Self-harm	Gender	Frequency	Percentage	Chi-square test	P	Contingency coefficient
Indirect	Local	57	17.8	2.291	0.13	0.067
	Non-local	51	27.3			
	Total	108	21.3			
Direct	Local	26	8.1	0.15	0.7	0.017
	Non-local	14	7.5			
	Total	40	7.9			
Total	Local	47	14.6	0.02	0.96	0.002
	Non-local	43	23			
	Total	90	17.8			

We observe from Table 3 that 14.6 % of the local students and 23 % of the non-local students engaged in self-harm. Additionally, 17.8 % of the local students and 27.3 % of the non-local students engage in indirect self-harm while 8.1 % of the local students and 7.5 % of the non-local students inflicted direct self-harm.

The frequency of distribution and percentage of the prevalence of self-harm among students based on age are tabulated in Table 4.

Table 4

Distribution of the frequency and percentage of the prevalence of self-harm among students based on age

Self-harm	Gender	Frequency	Percentage	Chi-square test	P	Contingency coefficient
Indirect	18-20	42	16.5	2.291	0.13	0.067
	21 and above	66	26			
	Total	108	21.3			
Direct	18-20	19	7.5	0.15	0.7	0.017
	21 and above	21	8.3			
	Total	40	7.9			
Total	18-20	34	13.4	0.02	0.96	0.002
	21 and above	56	22			
	Total	90	17.75			

The results of the Chi-square test in Table 4 indicated that there was a significant difference between local and non-local students in terms of direct and indirect self-harm (P<0.01).

Based on Table 4, 13.4 % of the students aged 18-20 and 22 % of the students aged 22-25 inflicted self-harm. Moreover, 16.5 % of students aged 18-20 and 26 % of students aged 21-25 inflicted indirect self-harm while 7.5 % of students aged 18-20 and 8.3 % of students aged 21-25 inflicted direct self-harm.

The results of the Chi-square test revealed that there was a significant difference between the age groups of students in terms of infliction of self-harm and indirect self-harm (P<0.01). Besides, the results of the Chi-square test showed that there was no significant difference between the individuals in terms of the order of birth and a history of academic probation with or without a record of inflicting self-harm.

4. Discussion

The aim of the present research was to investigate the frequency of the occurrence of self-harm behavior among university students. The findings of the research highlighted that the prevalence of such behavior stood at 17.7 % among the female students, 17.9 % among the male students and 17.8 % overall. The findings of this research corroborate with the previous studies estimated the percentage of the frequency of the occurrence of self-harm among university students varying between 15 and 20 % (Hamza &Willoughby, 2019; Kharsati & Bhola, 2019; Mullins-Sweatt et al., 2013; Sivertsen et al., 2019; Whitlock et al., 2013; Whitlock et al., 2011) Furthermore, several studies reported the percentage of the occurrence of self-harm to be more than 20 % and close to 50 % (Griffin et al., 2021; Nobakht & Dale, 2017; Taylor et al., 2012, Labouliere, 2009; Gratz, 2001,). This variance in the prevalence of self-harm behavior in different societies was indicative of the role

of cultural and social factors in the emergence of such behavior. Similarly, such variances exist across the society and the different cities of a country. For instance, in a study on the students of the Islamic Azad University, Babol Branch, the prevalence of self-harm behavior was 40.5 % overall (Nobakht, 2017), which was approximately three times higher than the result of the present study. Nevertheless, in a study conducted at the University of Tehran, the prevalence of such behavior was reported to be 12.3 % which was approximately close to what the present study found (Gholamrezaei, et al., 2017). Factors such as the type of assessed self-harm behavior and the questionnaires used can also have an impact on this variance.

The other finding of the present research was the absence of gender-based differences. This lends support to the previous findings of some studies signaling the lack of significant difference between men and women in terms of self-harm behavior (Taliaferro & Muehlenkamp, 2015; Gholamrezaei, et al., 2017; Whitlock et al., 2013; Garish & Wilson, 2015; Heath et al., 2008). Moreover, the current study does not support previous research in this area highlighting increased self-harm behavior among men and women (Nobakht & Dale, 2017; Whitlock et al., 2011; Bresin & Schoenleber, 2015; Lockwood et al., 2020; Moran, et al., 2012; Rotolone & Martin, 2012; Van der Wal & George, 2018)

Investigating the frequency of a variety of self-harm behavior signifies the existence of significant difference in some of this kind of behavior. The findings showed that male students inflicted direct self-harm on themselves such as burning their body parts; also, as indirect such behavior they exhibited alcohol abuse, intentional recklessness in driving and deliberately losing their jobs significantly more than female students. Female students got involved in relationships that exposed them to sexual abuse more than male students as well as intentionally starved themselves more. A large number of researchers believed that men, due to their high degrees of impulsivity and perceived stress, would harm themselves more than women, while the results of some studies corroborated the strong relationship between self-harm and impulsivity (Hamza & Willoughby, 2019; Mo et al., 2019). On the whole, impulsivity was higher in men than women; it is worth mentioning that impulse control disorder was one of the main reasons behind the self-harm acts of youths, and in particular men (Kharsati & Bhola, 2016; Whitlock, et al., 2011). In other words, impulsive self-harm happened in men more frequently than women (White et al., 2002). In the present study, it was witnessed that male students did impulsive self-harm behavior such as burning their body more than female students. Cultural factors and gender-based stereotypes also had influence on the emergence of such behavior. In different societies, there would be plenty of gender-based clichés that precluded the display of certain behavior in men and women. For example, in Middle Easterner countries such as Iran, the society accepts the exhibiting of such behavior as drinking alcohol, high-risk driving and impulsive behavior as the indication of masculinity, while women were warned against exhibiting such behavior (Mo et al., 2019). In other words, women exhibited such behavior less frequently or refrained from exhibiting it. Women would harm

themselves mostly due to internal reasons such as self-punishment or feelings of shame and guilt (Laye-Gindhu & Schonert-Reichl, 2005). Moreover, self-compassion in women was less common than men, suggesting the existence of feelings such as self-criticism, shame and guilt in women (Xavier et al., 2019). On this basis, it can be argued that it is more likely for women to refuse to leave an abusive relationship due to low self-compassion and self-worth, and even they blame themselves as they're being abused. Correspondingly, it is more likely for them to resort to self-harm behavior such as starvation than men due to the negative feelings of shame and guilt resulting from low self-compassion and high self-criticism. Based on the results of this study, and studies concurred with it, it could be concluded that men and women differed mostly in the type of self-harming behavior than they did in the number of occurrences of such behavior (Whitlock, et al., 2011).

The other finding of the present research revealed that the frequency of self-harm behavior in general and indirect self-harm behavior among the non-local students was more than the local students. Being away from the family and losing their family's support in confronting the challenges of entering a new setting could lay the groundwork for self-harm behavior in students. When these individuals meet new challenges and problems and lack sufficient support, it is probable that they fail to solve these problems and adapt to the situation on their own (Hilton, 2017). In addition, it is likely that because of entering a new setting, they may be beset by isolation and experience lower self-compassion. As a result, they may resort to self-harm as a means of solving their problems or gaining control over the situation (Cleare et al., 2019). Furthermore, supervision and control over the behavior of students not living with their parents and staying outside students' dormitory is less feasible. Therefore, these individuals are more than others prone to self-harm and high-risk behavior, considered to be indirect self-harm (Sivertsen, et al., 2019; Atadokht et al., 2013).

In the present research, the difference between university students aged 18-20 and those aged 21 and more in terms of self-harming behavior was observed. In a study conducted by Hamza and Willoughby (2019), it was found that self-harm among the junior and older students was more frequent than the freshmen. The results of the present study are consistent with the previous findings (Hamza &Willoughby, 2019). The current study does not support the previous research in this area. In fact, the results of this research are incompatible with studies expressing the lack of significant influence of age on self-harm behavior (Vidourek, 2018; Bresin & Schoenleber, 2015). Some scholars believed that perceived stress was higher in the early years of admission to university and self-harm was also more frequent in these years (Taliaferro & Muehlenkamp, 2015). Since it is likely that self-harm may surge with the uptick in challenges and academic problems in the subsequent years, provided that they are not dealt with in a timely fashion, it will become more complicated overtime. The results of another study suggested that chronic self-harm became aggravated as one grew older (Lang & Sharma-Patel, 2011). In other words, it can be stated that the number of

cases of chronic self-harm in individuals increases as people age, while it is probable that at lower ages, the number of people who has done self-harm multiple times may be greater.

5. Conclusion

In general, the findings of the present research illustrated that the prevalence of self-harm was 17.8 % and that female students and male students didn't show a significant difference in terms of the prevalence of self-harming behavior. However, these individuals revealed differences when considering the variety of self-harming behavior. Male students did impulsive self-harm and high-risk behavior more frequently, while female students displayed self-harming behavior originating from self-punishment and low self-compassion. What was notable was that the existing differences between female and male students mostly pertained to indirect self-harming behavior. Moreover, due to factors such as being away from their families and not receiving sufficient support and control, non-local students harmed themselves more than the local students. At ages above 20, university students did self-harm and particularly indirect self-harm more, which could underline the significance of investigating this issue and addressing it at lower ages. Besides, the students didn't exhibit a significant difference in terms of the variables of the order of birth and the history of academic probation. That said, researchers believed that self-harming individuals receive lower marks more than other students, and it is likely that they may fail their courses, facing academic failure (Mental health America, 2020; Hjorth, et al., 2016). As a result, the lack of significance of this variable might be connected to individual differences among the participants and the existing differences in the chosen society.

The findings of the present study can be utilized in the counseling centers of universities and the Ministry of Science for the identification of appropriate plans for the prevention of self-harming behavior among students. It is recommended that this study is replicated across different universities and at other levels of study and among different age groups. The findings of the present study merely hold true for the students of the undergraduate programs and are not applicable to other levels of education.

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Conflict of interest

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Research Paper: Predicting Married Women's Mental Health Based on the Quality of Life Components

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Abstract

Women's mental health can overshadow theirs other responsibilities; therefore, examining the role of influential factors in mental health has been considered a matter of importance. The present study aimed to investigate the role of emotional components of quality of life in predicting the mental health of married women. This study was descriptive-correlational. In this regard, 240 individuals from the married women community of Shiraz were purposefully selected and surveyed in cyberspace using the SF-36 Quality of Life Questionnaire and the General Health Questionnaire – 28 (GHQ-28). To analyze the data, multiple regression analysis (enter model) was employed. Data analysis revealed that emotional components of quality of life have a significant relationship with mental health ($p< 0.01$). Multiple regression analysis showed that the components of energy/fatigue, emotional well-being, and social functioning play a positive role in predicting the mental health of married women; moreover, the component of role dysfunction plays a negative part due to lack of emotional health. According to the findings of the present study, it could be concluded that the emotional well-being, happiness, and vitality of married women can play an important role in their mental health.

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1. Introduction

Enjoying the blessings of physical and mental health has been a necessity for the continuation of human life and is a necessary condition of embracing the gift of life. With the problems of today's world and their consequences in creating stress and psychological tension, facing psychological crisis has become inevitable for people in society, and therefore, the issue of mental health has become doubly important nowadays. There are various factors involved in a person's mental health including the life with optimal quality; over the years, finding the concept of a good life and knowing how to achieve those thoughts have been the focus of many studies. Women constitute half of the country's population as managers, educators of families as well as community activists; therefore, their health determines the health basis of half of the population, family, and society (Gholami et al., 2015). In addition, it must be acknowledged that the women's enjoyment of mental health is very important, overshadowing their other responsibilities. Therefore, it is important to investigate the role of influential factors in women's mental health.

Health is a state of complete physical, mental and social well-being (WHO, 2015). Although the World Health Organization has proposed a three-dimensional definition of biological, mental, and social health since 1946, in most countries the two psychological and social dimensions of health have been largely ignored by health system officials. About two decades ago, the World Health Organization issued a stern warning against this harmful negligence and pointed to the role of nearly 85% of psychosocial factors affecting health (Noorbala, 2011). Mental health is one of the crucial and basic concepts in psychology. In other words, the central part of health is mental health, since all health-related interactions are performed by the psyche (Videbeck, 2004). In recent years, two approaches to positive psychology, the issue of quality of life and its relationship with mental health have attracted the researchers' attention. In line with the focus of industries, capital, facilities, and urban services, the quality of life has grown quantitatively; later on, urbanization and the process of industrialization have brought problems, difficulties, neurological and psychological stress as well as environmental degradation to modern mankind. Many experts and scientists have paid much attention to the concept of quality of life to make efforts to improve living conditions and the qualitative dimension of life (Frisch, 2011).

Quality of life is defined as the result of the interaction between individuals' personalities and the continuity of life events; in this regard, life events occur in a "multidimensional set of domains of life such as liberty, knowledge, economy, health, safety, social relations, spatiality, environment and recreation", and quality of life affects the set of constituent domains of elements of life (Hajiran, 2006, p.33). Quality of life is an important aspect of family life, especially marital intimacy. It shapes people's health, which includes various dimensions such as health, physical comfort, as well as psychological and social aspects (Mazuchovan et al., 2018). However, some theorists agree that the concept of life always includes five dimensions: physical, psychological, social, and symptoms related to illness or treatment-related changes (King & Hinds, 2003). The results of the present study

indicated that there was a positive relationship between life satisfaction, quality of life, and components of psychological well-being (Ferrand et al., 2014). Thus quality of life and life satisfaction express the self- evaluation from different aspects of life; moreover, the person who is more satisfied with their life feels that they are doing well in various areas of life, such as education, job, family and interpersonal relationships (Diener, 2006). Gordon et al. (2007) and Hilary et al. (2012) in separate studies indicated that a significant relationship between psychological well-being and the quality of life as well as its components (physical functioning, due to lack of physical health role dysfunction, physical pain, general health, social functioning, role dysfunction due to lack of emotional health, energy/fatigue, emotional well-being). Nevertheless, Farhadi et al. (2009) concluded that the significant relationship only existed between the component of social functioning, quality of life, and psychological well-being.

Generally, the issue of women's mental health has been the matter of social and psychological importance. In this regard, to have healthy society their level of mental health and quality of life should be valued since they have significant effects on the mental health of other people in society. Evidently any deficiency in their physical and mental health can lead to the wastage of ability in this stratum, inevitably leading to slow progress in society. However, there may be different preventive measures to avert the vulnerability of this stratum; the results of the present study might deem exploitable for improving their quality of life and removing the obstacles. Additionally, the categories of psychological health and quality of life are two of the most controversial issues in the psychological system; despite doing a lot of research that has been done in these areas in recent years, such issues had a lot of ambiguity (Farahani et al., 2009). With regard to the components of quality of life, there has been a relationship between quality of life and mental health which have brought about some contradictions appearing in the studies; however, not all studies addressed the same components. On the other hand, in most studies, quality of life has been studied alone and its components have been researched less or there has been ambiguity about its components that have not been studied at once. Based on the mentioned theoretical and research principles and indeterminate nature of this ambiguity the main research question is whether the emotional components of quality of life can predict the mental health of married women.

2. Method

The present study was conducted based on a descriptive method. The participants included all married women in Shiraz in the year 1400. The computation principle of multiple regression model was employed to determine the sample size. Tabachnick and Fidell (2007) presented the following formula to calculate the sample size required for hierarchical regression with regard to the number of previous variables: $8m + 50 < N$ that in this formula, *m* is equal to the number of previous variables ($m = 5$ in this study). Accordingly, the sample size was calculated as 250, out of which by removing the distorted data, 240 questionnaires were accepted to be included in the statistical analysis

(incomplete or distorted questionnaires were returned). The questionnaires of this study were shared in cyberspace and after being completed, the questionnaires were collected and analyzed. Data analysis was performed using SPSS21 software.

2.1 Instruments

General Health Questionnaire (GHQ) is a screening questionnaire completed by the participants and used in clinical settings to diagnose people with mental disorders. In this questionnaire, two main categories were considered. First, the inability of the individual to show proper self-efficacy, and second, the emergence of new phenomena with disabling nature. This questionnaire was first developed by Goldberg (1972) and has been widely used to diagnose mild mental disorders in various situations. The main questionnaire has 60 questions, but the abbreviated ones with 30, 28, and 12 questions have also been used in various studies. The questionnaire includes four subscales of somatic symptoms, anxiety, social dysfunction, and depression. The different versions of this questionnaire have high validity and reliability, and the efficiency of the 28-question versions is approximately the same as the efficiency of the 60-question one. Dozens of studies presented by Goldberg and Williams (1988) in the UK and other countries have confirmed its validity and reliability. The results of a meta-analysis of 43 studies on the validity and reliability of this questionnaire reported an average sensitivity of 84% and an average specificity of 82% (Williams et al.,1987).

Quality of Life Questionnaire (SF-36)[1]: This questionnaire consists of 36 questions with multiple choice answers measuring a person's perspective on their health (Nejat, 2008). Translation and determination of reliability and validity of the Persian version of this standard questionnaire were conducted for people aged 15 years and older in Tehran done by Montazeri et al. (2006). The results of their study indicated the necessary adequacy of this tool for its use in Iranian society. The SF-36 scale has eight dimensions: physical functioning, due to lack of physical health role dysfunction, physical pain, general health, social functioning, due to lack of emotional health role dysfunction, emotional well-being and energy/fatigue for which the alpha coefficients reported are 0.90, 0.85, 0.71, 0.65, 0.77, 0.84, 0.77 respectively, which indicate good internal consistency of these dimensions. Other psychometric studies such as validation (Montazeri et al., 2006) have been performed, which specified the suitability of this tool (above 0.70). The factor analysis test also obtained two main components justifying 0.65 dispersion between questionnaire scales. This questionnaire had the essential reliability and validity.

3. Results

The participants of the present study consisted of 240 married women. For the purpose of data analysis, descriptive statistics especially central tendency and dispersion were employed to answer the research question. Moreover, multiple regression analysis (enter model) was hired to respond to research questions in the inferential part.

To investigate the presuppositions, Variance Inflation Factor (VIF) and Tolerance were explored. The observed

[1] The Short Form 36 Healthy Survey Questionnaire

values indicated that the presupposition of the absence of multicollinearity among the previous variables was seen. To evaluate the normality of data distribution frequency, Kolmogorov–Smirnov test (K–S test or KS test) was run, the results of which showed that the data had a normal distribution (P < 0.05). The results of correlation, statistical indicators of the mean and standard deviation of mental health, as well as quality of life components are presented in Table 1.

Table 1

Correlation matrix, the mean, standard deviation of mental health as well as quality of life components (N = 420)

Variable	1	2	3	4	5
Mental health	1				
Social functioning	0.47*	1			
Role dysfunction due to lack of emotional health	-0.20**	-0.40**	1		
Emotional well-being	0.46**	0.62**	-0.40**	1	
Energy/fatigue	0.28**	0.51**	-0.29**	-0.58**	1
Mean	55.37	6.82	1.28	15.02	10.36
Standard deviation	10.25	21.18	1.43	4.88	3.46

p<0.0* p<0.05**

The results in Table 1 indicated that there was a significant and positive correlation between mental health and emotional components of quality of life (social functioning, emotional well-being, and energy/fatigue) α=0.01 and therefore, (P <0.01); due to lack of emotional health, role dysfunction has a significant and negative relationship with mental health at α=0.05.

To evaluate the predictive power of each of the previous variables (quality of life) in mental health (the criterion variable) regression statistical analysis was performed by considering each of the components of quality of life (social functioning, due to lack of emotional health, role dysfunction, emotional well-being and energy/fatigue) (Table 2 and 3).

Table 2

Analysis of variance (ANOVA) test to evaluate the significance of the mental health prediction model based on the quality of life components

Model	SS	df	MS	F	Sig
Regression	8480.76	8	1060.09	14.70	0.0001
Residual	16656.98	231	72.11		
Total	25137.73	239			

The results of Table 2 revealed that the calculated F value of the analysis of variance of mental health regression based on the quality of life components was significant at α=0.01 alpha level, (F(8;239) -14.70 , P <0.001).

Table 3

Results of multiple regression analysis (enter model) to predict mental health through the quality of life components

Predictor variable	R	R^2	β	B	t	Sig	Durbin-Watson	F
Physical functioning	0.58	0.31	1.19	0.25	3.39	0.000	2.008	14.1
Role dysfunction due to lack of Emotional health			-0.44	-0.06	-0.96	0.000		
Emotional well-being			0.56	0.27	3.43	0.000		
Energy/fatigue			0.44	0.15	2.10	0.000		

The results of Table 3 illustrated that the quality of life components can significantly predict mental health. Generally, with a multiple correlation coefficient of 0.58, this variable could predict 31% of the variance of the criterion variable. With specific beta values, the data analysis of quality of life components could predict mental health by social performance with beta= 1.19, due to lack of emotional health, role dysfunction with beta= -0.44, emotional well-being with beta =0.56, and energy/fatigue with beta= 0.44; the component of emotional well-being had the most significant contribution to mental health (β=0.56, p <0.001).

4. Discussion

The results of the present study revealed that there was a significant relationship between the emotional components of quality of life (social functioning, role dysfunction due to lack of emotional health, emotional well-being, and energy/fatigue) and mental health. Multiple regression results also indicated that multiple components of quality of life, including social functioning, emotional well-being, and energy/fatigue played a positive role in predicting married women's mental health and due to lack of emotional health, the components of role dysfunction played a negative role. The results of this study are consistent with the previous findings (Ebrahimi Moghadam & Mahmoudi, 2017; Mardani Hamule & Shahraki Vahed, 2010; Okun et al., 1984; Wrosch et al., 2013; Becker et al., 2019; Routledge et al., 2013; Oladipo et al., 2013). In addition, these findings lend support to Molaei Yasavali et al.'s (2015) which indicated that there was a relationship between quality of life and psychological well-being and all its components. Moreover, the research of Omidy et al. (2002) showed that the frequency of bad health behavior in drug addicts such as sleep deprivation, lack of exercise, and non-observance of hygienic standards could directly reduce the quality of life in the physical dimension.

On the other hand, according to the descriptive findings of the present study, data analysis specified that the level of mental health in married women was above average and, in this regard, a considerable number of studies have highlighted

coordinately that compared to men, the components of mental health in women were more prominent, especially in the scales of anxiety, depression, and physical illnesses. Moreover, women assess threatening events with more stress than men and are more exposed to stress related to "*role function*" (Mirhashemi & and Hosseinsharghi, 2016). Women's health is affected by biological, psychological, social, emotional, economic, cultural, and environmental factors (Solhi et al., 2012). In this regard, quality of life could be considered to be an important component and one of the effective sources of mental health in research cases. Quality of life is a multidimensional and complex component; according to the definition of the World Health Organization, the situation in which people live and as well as the cultural context and education system in which they live is called perception, which is formed based on people's goals, expectations, standards, and interests (Forjaz et al., 2015).

The results of the present study concur well with the findings of Ferrand et al. (2014) who illustrated that there was a positive relationship between life satisfaction, quality of life, and components of psychological well-being. Thus quality of life and life satisfaction express the evaluation of the individual from different aspects of life, and the person who is more satisfied with their life feels that they are doing well in various areas of life, such as family and interpersonal relationships, education and job (Diener, 2006). Moreover, the results of research by Gordon et al. (2007) and Hilari et al. (2012) suggested that there was a significant relationship between quality of life and its components with psychological well-being.

The results of Matud's (2004) study indicated that compared to men, women scored higher in emotion-focused coping and avoidance coping styles. In other words, the results highlighted that woman displayed less emotional inhibition in encountering stressful situations compared to men. The results also revealed that women scored higher than men in somatic symptoms and psychological disorders. Additionally, women were more vulnerable than men due to the use of emotion-focused coping and avoidance coping styles. Wilson and Oswald (2005) found that there was a significant difference between the two genders in the scores of somatic and psychological well-being symptoms (anger, depression, tension, and negative emotions). The results of these studies put emphasis on the role of gender in explaining the psychological health of individuals.

On the other hand, it should be noted that according to the definition of mental health by a quality group by the World Health Organization (1996), mental health is not only the absence of mental disorders but also includes other components such as pleasant feelings and life satisfaction, flexibility, growth, and excellence. In this regard, Joshanloo et al. (2012) stated that a healthy person could effectively cope with the stresses generators in life and could adjust to the constant pressures of daily life adequately. Therefore, it could be said that having general health helps people to have psychological health by reducing physical complaints, allergies, depression, anxiety, aggression, phobia, and morbid general symptoms and discomfort.

Regarding the role of social functioning as a component of quality of life in married women's mental health, it could be explained that the relationship between social relations and physical as well as mental health of the individuals has been increasingly highlighted by researchers. Alternatively, social relations were considered to be a part of individuals' social health (Vameghi et al, 2013) and social relations had a useful role in maintaining the mental well-being of human beings (Cohen, 2004). It is noteworthy that the social component of human health, which is called social health, mainly puts emphasis on human interaction with the environment and human roles. In this regard, according to Russell (1973) social health was a dimension of comfort that focused on how one could relate to others, how others could react to the individual, and how one could interact with institutions and social customs. Moreover, according to Larsen (1996), social health could be considered to be a person's report on the quality of their relationships with other people, relatives, and social groups. He (ibid) believed that social health, as a part of a person's health, indicated a person's satisfaction or dissatisfaction with life and social environment.

It was also said that social and economic factors were among the factors affecting mental health (Bierman et al., 2006); in addition to their social roles, most women were required to fulfil duties and responsibilities as parents, even when women worked outside the house, they were still responsible for household chores (Fallahchai & Fallahi, 2016). In this regard, based on perspectives related to social health, we could refer to a person's social functioning, that is, the person's participation in normal social roles such as marriage, parenthood, work, and leisure time shows the degree of her success in selective social roles and it is also called social adaptation. Another area to be considered was social relationships, which was very close to the concept of social support and was generally defined as the availability of people whom one trusted and was encouraged by, forming a sense of importance and worth (Mac Dowell, 2006); to have this sense of worth, social support and success in social roles were effective in increasing the person's mental health.

It should be noted that social functioning as a concept of social health to be considered one of the three components of health; in this regard, the role of physical health on the performance and mental ability of individuals were specified affecting the individual's relationship with society (Mental Health Commission of Canada, 2009). On the other hand, before being considered a dimension of health, social support, as a sign of social health, was a mediating variable that changes the effect of environmental tensions and stresses on physical and mental health reducing the incidence of disease. Moreover, this issue indicated that the role of the relationship and social support, which in terms of social factors related to health is considered to be a social determinant affecting different dimensions of human health (Commission on Social Determinants of Health, 2005). Accordingly, the social component is related to the individual's relationship with family, friends, colleagues, and ultimately the community (King & Hinds, 2003). Therefore, having a positive attitude towards life, being ready to face life problems, having a good feeling about

oneself and others, feeling responsible, having a real perception of the world and other people, not being indifferent to oneself and family, being flexible and losing control in the face of social problems and not being pessimistic towards others enhance a person's mental health (Kaveh, 2012). A person with mental health is generally referred to as someone who is at a high level of behavioral and emotional adjustment, not just someone who does not have a mental illness (Karimi, 2011). Thus the field of social relations is both a part of the pillars of health status and depends on it, and it also can affect other aspects of health.

On the other hand, to explain the role of emotional well-being and energy/fatigue (energy/fatigue is happiness, vitality) in the mental health of married women, we can refer to the definition of the World Health Organization which states that health does not mean the absence of disease, but includes physical, psychological and social aspect of life. In other words, the human living environment in today's complex societies can challenge health in physical, social, economic, and psychological aspects. The social-ecological model, with a prominent place in the development and improvement of health and hygiene, underlines the impact of physical and social phenomena on health. There is no doubt that personal characteristics are always considered to be a modulating factor of these influences (Stokols, 1992). Putting emphasis on the fact that psychological, social, and physical well-being is the result of human interaction with their physical and socio-cultural environment provides the underlying logic of recognition and understanding of the links between environmental characteristics and health level (VukoviĆ et al., 2021). In this regard, a person's perception of life and the purpose as well as meaning of life (King & Hinds, 2003) as a sign of emotional well-being plays a role in mental health.

On the other hand, mental health is closely related to a range of other components such as happiness, adjustment, self-esteem, positive emotions, and feelings (Ryff, 1989; Garcia et al., 2012) and therefore it can be said that it generally provides the basis for enhanced life satisfaction, self-esteem, as well as moral and mental well-being, leading to higher mental health. That is to say, a person with enhanced self-esteem and satisfaction with life as well as good conditions cannot suffer from mental distress.

In addition, in explaining this finding, it can be said that psychological health is the growth and development observed regarding the existential challenges of life, and having a healthy psyche helps a person to overcome unpleasant and painful experiences, evaluate situations as well as events favorably, manage negative emotions, and separates their reactions from raw sensory reactions to step on the path of realizing their potential abilities and thus improving individual personal life.

Generally, people with high mental health have good knowledge and insight about their cognitive processes and abilities; they also use effective strategies for coping with tasks and skills utilizing. In other words, mental health increases the person's awareness of themselves, others, and life situations, and this increase in awareness may indicate that there is an increase in health symptoms and adaptation parallel to these abilities. To put it in another way, increasing the level of

awareness and consciousness, as a sign of mental health, makes a person aware of their conditions so that they can live at the moment and take full advantage of the situation (in various activities that can be used as appropriate strategies for maintaining health). People with high mental health are more likely to evaluate sources of stress, employ avoidance coping strategies less, and use problem-focused coping. Additionally, psychological explanations of quality of life puts emphasis on persons' differences regarding thinking style and the way they feel about their behavior. Distinctions can appear in the form of subtle differences in behavior; moreover, some people consider their quality of life undesirable for reasons such as increased anger and nervousness, little dependence, and fixation on others, the explanations of which can be expressed under the psychoanalysis model and the personality disorders (Mokhtari & Nazari, 2010).

Newer psychological thinking, based on both research and theory, stresses the elements of happiness: People are happy when they find a positive resemblance between their current lifestyle and their expected lifestyle. The basis of cognitive theories is judging and evaluating to see whether the reality is in line with people's expectations, criteria, or ideals. In this view, people judge their happiness and satisfaction with life by comparing their current situation with various criteria and standards such as others, past (past circumstances), or personal goals and ambitions. In life, when a person's needs are met and their goals, or ambitions are attained, they feel satisfied, and then they feel happy emotionally (Frisch, 2011). By the positive psychological approach (Frisch, 2005) to quality of life and by taking care of oneself it can be said that emotional well-being is an inner richness with a deep sense of tranquility, vitality, concentration, love, awareness, and readiness to face the challenges of individual life (Frisch, 2011) improves a person's mental health. Mental well-being as a component of quality of life is related to a person's expectations, feelings, beliefs, and ideas; therefore, a person's assessment of his or her health or well-being is an important factor in the quality of life. Consequently, according to Dinier et al. (2003), the quality of life includes affluence, well-being, personal perception of better living, welfare, feeling of prosperity, and life satisfaction (Frisch, 2011), all of which are effective in having a healthy mind.

5. Conclusion

Generally, according to the results of the present study, the components of quality of life could predict mental health. That the component of emotional well-being, among the components of quality of life has the largest contribution to mental health. It could be inferred that it was a healthy family that had a high quality of life. As mentioned earlier, the quality of life is people's perception of their position in life in terms of culture, the value system in which they live, their goals, expectations, standards, and priorities; therefore, it is a completely subjective matter which cannot be seen by others and is based on people's understanding of various aspects of life. Hence the quality of life can be an effective factor in people's mental health.

This study had some limitations, including the sample variety; all married

women in Shiraz. Consequently, generalizations to other communities should be made with caution. In data collection, self-reporting tools were used, which seems to be a possible source of bias in response. In this study, gender was not considered to be a research variable, based on which comparisons between the two genders wasn't taken into consideration. It is suggested that the present study be conducted among different participants in other cities as well. In future research, considering gender, as a desired variable, should be considered. In view of the role of some components of quality of life, it was suggested that training workshops be held in the field of teaching methods for improving the quality of life as measures to increase the psychological health of married women.

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Conflict of Interest

The Author declares that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: The Comparison of Body Image and Depressive Symptoms in People with Gender Dysphoria and Non-Affected People

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Abstract

People with gender dysphoria experience some mental health problems, such as anxiety and depression. The present study aimed to compare body image and depressive symptoms in people with gender dysphoria and the non-affected. This research was applied in terms of purpose and casual-comparative in terms of methodology. The statistical population of the study included two groups of people with gender dysphoria approved by the Iranian legal medicine organization in 2021 and non-affected people with gender dysphoria. For sampling, 30 people from both groups (15 males and 15 females) were selected by the convenience sampling method. A Multidimensional Body–Self Relations Questionnaire (BSRQ) and The Beck Depression Inventory-II (BDI-II) were employed to gather research data. Data analysis was performed by Independent Sample T-Test using SPSS-20 software. The findings of the study indicated that the mean scores of body image ($P<0.01$) and depressive symptoms ($P<0.05$) were significantly different in people with gender dysphoria and the non-affected people. People with gender dysphoria had a more negative body image and more depressive symptoms than non-affected people.

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1. Introduction

The beginning of any sexual behavior is started by gender. The gender of every human being is defined as a female or a male from the fetal period and when he or she grows up in the womb and maybe it is the first source for future sexual behavior; since the type of gender will bring special and unique sexual behaviors (Pourkazem Mohammad Fereydoni & Eshghi Nogorani, 2018), gender identity forms a major part of human identity; it is formed around the age of 2-3 and includes the image that each person has of himself or herself as a man or a woman. One learns to think, behave and feel in a certain way by being aware of gender identity (Rahimain Ahmadabadi et al., 2020).

A person may biologically have the characteristics of a particular sex, but s/he does not psychologically belong to that group. Such a person feels and behaves like a member of the opposite sex. This dual situation significantly causes mental disorders and impairs a person's performance. This phenomenon is called gender dysphoria disorder (Barghi Irani et al., 2015).

The definition of a person with gender dysphoria disorder is a psychological identity that differs from his or her observable biological sex. In the fifth edition of the diagnostic and statistical manual of mental disorders (American Psychological Association [APA], 2013) the term gender dysphoria is used instead of gender identity disorder, which is defined as follows: Feeling anxious about one's biological sex, which is not coordinated with the sex one experiences and expresses. This discord and sense of belonging to the opposite sex include various aspects, such as aspects related to self-perception, body image, interpersonal relationships, the use of defense mechanisms, and social adjustment. For this reason, these people are under pressure and stress from various dimensions of society and the family. (Montashloo et al., 2016).

In the research background, other terms have been used for people with gender dysphoria disorder and non-affected people. A Cisgender, for example, is a person who identifies with the gender assigned to him or her from birth. For example, a person who has been assigned a female gender since birth and introduces herself as a female and considers herself to be of a female's nature gendered is a cisgender woman (Malmquist et al., 2021). Transgenders, on the other hand, are people who have a gender identity contradicting their psyche. Transgender is a term used to identify people who have an incongruous gender identity or do not have a proper cultural fit with their physical identity. Transgender means that a person's psycho diagnosis of his or her gender is different from that of his or her genitals at birth. Transgenders are interested in going through the stages of change and joining the opposite sex a lot (Afsharian et al., 2019).

People with gender dysphoria disorder or transgenders sometimes seek gender confirmation therapies, including hormone therapy or thoracic and genital change surgery[1] ("High" and "Low" gender confirmation surgeries). These treatments may improve the discomfort of a mismatch between a person's physical appearance and their gender identity (Owen-Smith et al.,

[1] Sex/Gender reassignment surgery: SRS/GRS

2018). Transgenders experience higher levels of depression and anxiety disorders than the general population. Another reason for the increased risk of transgenders suffering from mental disorders compared to normal people is the increased susceptibility to the minority stress due to being labeled by those around them followed by the presence of transgender behavior (Jenabi Ghods et al., 2020).

In addition to social difficulties, this disorder causes individual differences in these people compared to non-affected ones (Shairi et al., 2019). Gender dysphoria disorder has a long history in psychiatry and psychology. In terms of semiology, diagnostic criteria, and intervention methods, this disorder has been influenced by social norms related to the concept of gender identity and medical advances. Each of the biological, psychological, social, and cultural approaches to gender dysphoria disorder and its occurrence have put emphasis on different factors. Evidence indicates that people with dysphoria or gender dissatisfaction have other types of mental health problems, such as anxiety and depression, as well as family conflicts (Ghazanfari et al., 2018).

Transgenders have problems with their body image. Body image is a multidimensional structure consisting of thoughts, beliefs, feelings, and behaviors related to the perceived image of body. Body image is considered as a continuum, on the one hand, there are people without distortion in their perception of body image, and on the other hand, there are people with severe distortion in their body image (Ahmadpour torki et al., 2018). A mental image of the body is defined as the degree of satisfaction with a physical appearance, meaning the size, shape, and general appearance of the body, including sameness between the current body image and the ideal body image. According to Noroozi et al. (2021), the mental image of the body can be defined as an individual's experience of the physical self. Research has indicated a more negative body image in people with gender dysphoria disorder compared to non-affected people (Montashloo et al., 2016). People who are more satisfied with their gender identity indicate more satisfaction with their body (McGuire et al., 2016). Transgender women and men indicate higher shame scores than cisgender women and men (Strubel et al., 2020).

Hepp et al. (2005) report the highest comorbidity with anxiety and mood disorders in research on the comorbidity of gender dysphoria disorder with mental disorders. The prevalence of depression in people with gender dysphoria disorder is high (Mazaheri Meybodi et al., 2014; Dhejne et al., 2016; Catelan et al., 2022). Depression is considered to be the second cause of human disability all over the world. The main component of depression disorder is sadness. People with depression describe their mood as sad and helpless (Abdolpour et al, 2019).

Depression, anxiety, and stress can be mentioned as common psychiatric disorders in transgenders. Depression and subsequent stress and anxiety are associated with decreased self-confidence and increased incidence of other psychiatric disorders in this group (Jenabi Ghods et al., 2020). In previous studies, there has been a difference in terms of the level of depression between people with gender dysphoria disorder and non-affected people

(Montashloo et al., 2016; Rahimi Ahmadabadi et al., 2016; Afsharian et al., 2019; Owen-Smith et al., 2016; Strubel et al., 2020; Morafi et al., 2020).

According to the differences between people with and without gender dysphoria disorder, it seems that conditions related to gender issues can cause psychological disorders in a person. Therefore, paying attention to such differences can create clear frameworks for solving the problems and disorders of the relevant people and identify clear ways to reduce the individual and social problems of these people. Thus the researchers in the present study compare body image and depression symptoms in people with and without gender dysphoria disorder. The main question of this study is whether there is a difference between body image and depressive symptoms in people with and without gender dysphoria disorder?

2. Method

The present research was applied in terms of purpose and casual-comparative in terms of methodology. The statistical population included two groups: The first group of people with gender dysphoria disorder who were diagnosed with this disorder by the Iranian legal medicine organization and were the members of the telegram channels related to these people in 2021. Thirty individuals affected with gender dysphoria disorder (15 females and 15 males) were selected by convenience sampling method from these individuals. To ensure the diagnosis of the disorder, the participants sent a copy of their authorization of gender reassignment or their gender dysphoria disorder diagnosis to the researchers. The second group were 30 people without gender dysphoria disorders, (15 females and 15 males) were selected from the other Telegram groups by convenience sampling. Inclusion criteria comprised of satisfaction to participate in the research, having at least a diploma and not having gender reassignment surgery in the group affected with gender dysphoria disorder, and not being affected with gender dysphoria disorder in the non-affected group. Exclusion criteria comprised of dissatisfaction to participate in the research, and lack of at least a diploma, undergoing psychotherapy or drug treatment for psychiatric disorders (included in the questionnaire).

2.1. Research Tools

The Multidimensional Body-Self Relations Questionnaire (BSRQ): It was devised by Cash, Winsted and Janda (1985). This questionnaire consists of 68 items designed to assess the individual's attitude about the various dimensions of the body image structure. The first edition of this questionnaire was designed in 1983 and included 294 items. In the second edition, duplicated sections were removed and some sections were moved according to the new criteria. The validity of the main sections of the questionnaire was examined and confirmed by Brun, Cash, and Mulka (1990), and its reliability was also reported to be 0.81. The reliability of this tool in Iran has been confirmed by Zarshenas et al. (2015). The reliability of appearance awareness subscale was 0.87, evaluation of appearance was 0.85, concern about weight gain was 0.82, different body parts satisfaction was 0.79, and evaluation of weight from the individual's point of view was 0.75. The Cronbach's alpha coefficient of the questionnaire in the present study was 0.87.

The Beck Depression Inventory-II (BDI-II): This questionnaire was developed by Beck in 1996 to assess the feedback and symptoms of depressed patients. Its items were based on the observation and summary of common attitudes and symptoms among depressed mental patients. This is a self-assessment questionnaire and is completed in five to ten minutes. The Beck Depression Inventory consists of a total of 21 items related to various symptoms for the participants to answer on a four-point scale from zero to three. Thus 2 items are dedicated to affection, 11 items to cognition, 2 items to overt behaviors, 5 items to physical symptoms, and 1 item to interpersonal semiotics. Consequently, this scale determines the different levels of depression from mild to very severe, and its score range is from the minimum of zero to the maximum of 63. In his research, Kaviani (2008) reported the validity coefficient as 0.70, the reliability coefficient as 0.77, and an internal consistency of 0.91, and Besharat (2004) conveyed Cronbach's alpha coefficient for a sample of normal participants from 0.85 to 0.92 and a sample of patient participants from 0.83 to 0.91. The alpha coefficient calculated for the questionnaire in the present study was 0.93.

Descriptive statistics measures and inferential statistics techniques (Kolmogorov-Smirnov test and independent t-test) were employed to analyze the data. The statistical software used in this study was SPSS-20.

3. Results

50% (n=30) of the participants were men and 50% (n=30) were women. In both affected groups with gender dysphoria and the non-affected, most respondents were under 30 years old, which formed 46.6% of the respondents (n=28) and 31.7% of the respondents (n=19), respectively. In addition, the lowest number of respondents were in the age group over 50 years; that is to say, in the affected group with gender dysphoria, no one was in this age range, and in the non-affected group without gender dysphoria, 1.7% of the respondents (n=1) was in this age range of more than 50 years. Most of the respondents in the affected group with gender dysphoria had associate's degree and lower, i.e., n=16 (26.7% of the respondents). Moreover, in the non-affected group, without gender dysphoria, the most responsive group was people with undergraduate degree, which formed 18.3% of the respondents (n=11).

Table 1 indicates the descriptive statistics of the research variables.

Table 1

Descriptive statistics of research variables in both affected and non-affected groups

Group	Variable	N	Minimum	Maximum	M	SD
Non-affected group	Body Image	30	190.00	322.00	235.7000	28.87565
	Depression	30	.00	47.00	14.6667	13.32960
Affected group	Body	30	180.00	266.00	213.7333	21.57255
	Depression	30	.00	60.00	20.3333	13.36060

As can be seen in Table 1, the mean of score of depression in the affected group was lower than the non-affected group and the mean of score of body image of the affected group was lower than the non-affected group.

To perform a suitable statistical test, first, the assumption of normal distribution in scores of body image and depression variables was studied using the Kolmogorov-Smirnov test and the Z statistic for body image and depression variables was 0.851 and 0.759, respectively, not being meaningful; this means that the distribution of variables in the sample was normal. Therefore, an independent t-test was run to evaluate the significant difference between the mean scores of people with gender dysphoria disorder and non-affected people regarding the studied variables, namely body image, and depression. The results are given in Table 2.

Table 2

Independent t-test results to compare the mean of body image variables and depression in people with gender dysphoria disorder and non-affected ones

Factors examined in the study	Affected people's mean scores	Non-Affected people's mean scores	df	t	sig
Body Image	213.73	235.70	58	3.338	0.001
Depression	20.33	14.67	58	-1.964	0.048

According to the findings of Table 2, the mean score for body image at the alpha level of 0.01 and the mean score for depression at the alpha level of 0.05 were significantly different in terms of affliction of respondents with gender dysphoria disorder and lack of it. People with gender dysphoria have a mean score of 213.73 for the body image variable and non-affected people have a mean score of 235.70. Furthermore, regarding the depression variable, the mean score of people with gender dysphoria was 20.33, and non-affected people with 14.67. People with gender dysphoria had lower mean scores on body image as well as higher scores on the depression variable.

4. Discussion

Affliction with a gender dysphoria disorder in some people causes some differences in them compared to others; it should be considered in appropriate circumstances in the field of reducing psychological problems for these people, both individually and as a member of society. People with gender dysphoria disorder tend to dress and behave like the opposite sex. The desire of these people is not limited to being in a position or having the membership of another gender but focuses on having different gender. Such a situation naturally creates contradictions and differences for the affected people which can be considered in the field of psychology. Body image and depression symptoms are among the issues in which those affected with gender dysphoria disorder or non-affected ones can have different manifestations within individuals. Therefore, body image and depression symptoms in people with and without gender dysphoria disorder were compared in this study.

The results of the present study indicated that people with gender dysphoria had a more negative attitude toward their bodies than non-affected people. The results of the present study are in line with the results of studies conducted in this field (Montashloo et al., 2016; McGuire et al., 2016; Strubel et al., 2020; Romito et al., 2021). Creating a satisfactory body image, and subjective experience of physical appearance is difficult for people with gender dysphoria disorder, which can sometimes lead to disturbance in body image. In addition to being under pressure in the environment and society due to their appearance, people with gender dysphoria disorder, have a lot of preoccupation with their body and obsessively explore their bodies, and always tend to have body dysmorphia. A person who has a noticeable discrepancy between his or her experienced gender and his or her assigned gender has a special focus on his or her body and does not consider any part of the body, especially the genital and sexual parts, to belong to him or her. As a result, s/he will have a negative body image towards herself/himself and is always thinking about gender reassignment and making her/his body more beautiful.

The results of the study also indicated that the depression symptoms in people with gender dysphoria disorder were more than in non-affected people (Rahimi Ahmadabadi et al., 2016; Jenabi Ghods et al., 2020; Strubel et al., 2020; Morafi et al., 2020). In the cultural context of our country, social acceptance of people with the behavior attributed to gender dysphoria disorder is very difficult and it is a stressful process for the affected person (Mantashloo et al. 2016). On the other hand, when a norm is accepted by a person but is in conflict with social reality, it causes stress and leads to personality and mental disorders in these people. People with gender dysphoria disorder also experience significant levels of psychological distress, including depression, as a result of multiple stressors, including family and social exclusion, financial and work issues, as well as difficulties in going through the legal proceedings of gender reassignment. This is why researchers express that the cause of depression, especially in transgenders, is not only the chemical mediators' disequilibrium in the brain, but also many factors including social, economic, health, and relationships with others which are involved in the occurrence of these disorders (Jenabi Ghods et al., 2020).

5. Conclusion

In general, the results revealed that people with gender dysphoria disorder had a more negative body image and experience depression more than non-affected people. Therefore, it seems necessary to pay attention to creating a more positive body image for them and treating depression in these people. Consequently, to prevent the negative effects of these problems it is suggested that centers for the identification and psychotherapy of people with this disorder be established. Since the present study was cross-sectional, it is suggested that longitudinal research be conducted in this field and the role of factors such as education level, social status, etc. in the level of depression and the situation of body image of these people be investigated.

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Conflict of Interest

The Authors declare that there is no conflict of interest with any organization. Also, this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Research Paper: Comparison of Attachment Styles, Problem Solving Styles, and Sensitivity Anxiety in Cardiovascular Diseases patients and non-patients

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Abstract

Cardiovascular diseases are regarded as one of the most disabling diseases of human beings around the world, particularly when psychological characteristics are taken into consideration. This study compared attachment styles, problem solving styles and sensitivity anxiety in cardiovascular diseases patients and normal Individuals. A total of 40 participants (20 diseased, 20 normal) were selected thought random cluster sampling procedure from among a population of cardiovascular diseases in the city of Ardabil. Data were collected using the attachment styles inventory (AAI), problem-solving styles questionnaire (PSSQ) and the anxiety sensitivity index (ASI); moreover, multivariate analysis of variance used for data analysis. These finding implied that among attachment styles, problem solving and sensitivity anxiety there existed differences in cardiovascular diseases patients and non-patients. Results showed that cardiovascular diseases patients used higher avoidance and ambivalence attachment than non-patients. Result also revealed that non-patients used higher safety attachment than cardiovascular disease patients and patients employed avoidant attachment style as well as ambivalence. Moreover, cardiovascular diseases patients had higher helplessness, problem solving control and avoidance style more than non-patients and the non-patients used higher creativity style, problem-solving confidence, avoidance style more than cardiovascular diseases patients. It was also found that cardiovascular diseases patients used higher physical, cognitive, social worries than non-patients. Overall, the finding indicated that attachment styles, problem solving styles and sensitivity anxiety were important components discriminating cardiovascular diseases patients from non-patients. The suggestion for further studies is about other variables in cardiovascular diseases to provide preventive strategies for these diseases.

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1. Introduction

Cardiovascular diseases, one of the leading causes of death and disability worldwide, account for one-third of all deaths (WHO, 2007). Chronic diseases have increased as life expectancy is increasing, with heart disease deaths reaching more than 25% by the end of the twentieth century; by 2025, it is estimated that heart disease will account for more than 35% to 60% of all deaths and as a result of the change in human lifestyle, non-communicable diseases are now the leading cause of death. Cardiovascular diseases occur for a variety of reasons such as cholesterol, diet, family history, blood pressure, obesity, lack of physical involvement, stress, and smoking; these are risk factors for this disease. Chronic life stress, anxiety, and depression also increase the risk of heart disease. Men are more at risk for heart disease than women. Some other influential factors such as gender, age, and family history are not changeable (Rosanoff & Seelig, 2004). Among the important psychological factors are attachment, problem-solving, and anxiety sensitivity, which will be thoroughly discussed.

Adult attachment refers to ways of experiencing attachment relationships in adulthood. Hazan and Shaver (1987) restored Anisworth's infant attachment patterns to adult attachment patterns. The three types of adult attachment styles are safety, avoidant, and anxious-ambivalent attachments (Soleimani, 2009).

The process of problem-solving is cognitive-behavioral and innovative; it identifies or develops effective, adaptive strategies for resolving everyday problems (Cassidy & Long, 1996). Nezu (1987 as cited in Cassidy & Long, 1996) introduces six styles of problem-solving: creative, trust, tendency, helplessness, restraint (control), and avoidance.

Anxiety sensitivity is a basis of individual differences in which a person is afraid of physical symptoms associated with anxious arousal (increased heart rate, shortness of breath, dizziness), and it is believed that these symptoms, could have potentially harmful social, cognitive, and physical consequences (Deacon et al., 2003). Anxiety sensitivity might be considered as a risk factor for anxiety problems (Zvolensky et al., 2006). Izadi tameh et al. (2014) in a study examined the relationship between attachment styles with self-efficacy and self-care in patients with type 2 diabetes. In this descriptive-analytical study, 200 diabetic patients were studied. The results revealed that there was a significant correlation between different styles of attachment (safety, avoidant, and ambivalent) with the level of self-efficacy and self-care of diabetes at a significant level. Behrouz et al. (2013) compared the personality and problem-solving styles of patients with coronary heart disease, chronic low back pain, and non-patients in a study. Their findings illustrated that the personality dimensions of neuroticism and psychosis were negatively correlated with healthy problem-solving styles (creative, trust, and tendency) and positively correlated with unhealthy styles (avoidance, helplessness, and control). In a study entitled comparison of anxiety sensitivity and happiness of patients with irritable bowel syndrome (IBS) with non-patients in Shiraz, Ghasemim (2012) concluded that IBS patients suffer from more anxiety sensitivity than their non-patient peers.

Given that no research has been done in this field on cardiovascular patients, the

main question that arises is: Is there a contrast between cardiovascular patients and non-patients in terms of attachment styles, problem-solving styles, and anxiety sensitivity?

2. Method

The present research was a scientific-comparative study. Regarding choosing methodology and variables, the independent variable had occurred before; therefore, its effect on the dependent variable was examined. all cardiovascular patients admitted to Ardabil hospitals with an age range of 15-65, having both secondary and higher education were considered. Among all cardiovascular patient in the age range 15-65 years, 20 cardiovascular patients referred to three out of seven Ardabil hospitals were chosen randomly as the participants of the study based on a multi-stage cluster sampling method. From the families of selected patients, 20 healthy individuals who had no history of cardiovascular disease in the previous years were selected as the control group. Adult attachment style questionnaire, problem-solving style questionnaire, and revised anxiety sensitivity index were used for data collection.

Attachment Style Questionnaire*:* This is presented by Hazan and Shiver (1987) and has 15 questions that measure the three styles of safety attachment, avoidance, and ambivalence on a five-Likert scale ranging from (very low = 1, very high = 5). The minimum and maximum scores of the participants in the test subscales are 5 and 25, respectively. Hazan and Shaver (1987) reported the reliability of the total retest of this questionnaire as 81% and reliability of Cronbach's alpha as 78%. In the present study, Cronbach's alpha of this questionnaire was 0.85.

Problem Solving Style Questionnaire: This questionnaire was developed by Cassidy and Long (1996) with two steps and has 24 questions (with subjective "yes/no" questions) that measure 6 factors and each factor includes 4 test items. These factors include helplessness, problem-solving control, creative problem-solving style, problem-solving confidence, avoidance style, and approach style. It is worth mentioning that the sum of these scores represents the total score of each. Any factor with the highest score indicates that the person uses that method when facing problems. The calculated reliability of this instrument's subscale by Cronbach's alpha coefficient was reported as 0.37 to 0.72. Cronbach's alpha coefficient was 0.80 in the present study.

Anxiety Sensitivity Index (ASI): The Revised Anxiety Sensitivity Questionnaire is a 16-item questionnaire developed by Reiss et al. (1986). This questionnaire is located on a 5-point Likert scale from 0 to 4. Magnitude of fear is an anxiety symptom marked with high score. The range of scores are between 0 and 64. As each of these items suggested, anxious emotions can be unpleasant and have the potential for traumatic consequences (Floyd et al., 2005). Physical concerns, mental incapacitation concerns, and social concerns are examined in this questionnaire. The psychometric properties of this scale indicate it has high internal stability, with an alpha value between 0.8 and 0.9. The validity of retest after 2 weeks was 0.75 and has been 0.71 for 3 years, showing that ASI is a stable personality structure. (Reiss et al., 1986). Cronbach's

alpha coefficient was 0.76 in the present study.

3. Results

The mean and standard deviation of age in this study were 32.70 and 0.71, respectively, in the age range 25-41 years**.** 47.5% (19 participants) were female and 52.5% (21 participants) were male**.** 40% (16) were single and 60% (24) were married. 30% of people (12 people) had a middle school diploma, 40% (16 people) had a diploma, 15% (6 people) had an undergraduate's degree and 15% (6 people) had a bachelor's degree. Moreover, in this study, the mean and standard deviation of the history of the disease were 2.90 and 0.30, respectively, with a range of 1-6. The study variable means and standard deviations are shown in Table 1 for each of the groups and altogether.

Table 1

Mean and standard deviation of attachment, problem-solving, and anxiety sensitivity components in cardiovascular patients and non-patients

Variable	Patients		non-patients		General	
	SD	M	SD	M	SD	M
Avoidance	1.27	15.40	1.71	13.00	1.92	14.20
Safety	1.04	11.40	1.31	16.05	2.63	13.72
Ambivalent	1.09	14.55	1.68	12.25	1.82	13.40
Helplessness	0.51	2.45	0.97	1.30	0.96	1.87
Control	0.60	1.50	0.76	2.80	0.94	2.15
Creative	0.85	1.90	0.59	3.60	1.12	2.75
Confidence	0.78	2.10	1.16	2.75	1.03	2.42
Avoidance	0.81	3.35	0.59	1.40	1.21	2.37
Approach	0.36	2.85	0.78	2.10	0.71	2.47
Social concerns	1.60	15.50	3.72	8.05	4.71	11.77
Mental incapacitation concerns	1.80	12.70	3.81	7.55	3.98	10.12
Physical concerns	1.70	13.55	2.65	9.00	3.18	11.27

The results of Table 1 illustrated that the average use of avoidance and ambivalent styles were higher in the patient group than in the non-patient group, while the use of safety styles was higher in the non-patient group. Additionally, the problem-solving styles of helplessness, avoidance, and approach were greater among the patient group compared to the other group. The average use of creative problem-solving style, problem solving control, and problem-solving confidence was higher in the non-patient group. In addition, the averages of physical, mental incapacitation, and social concerns in the non-patient group were higher than the patient group.

To select the most appropriate statistical test to compare patient and non-patient groups, the status of the studied variables was examined and it was found that each of the research variables (attachment styles, problem-solving styles, and anxiety sensitivity) had a normal distribution (indices of skewness and elongation of dependent variables were between ±1). On the other hand, missing or unrelated data were not observed in any of the dependent variables. Additionally, the correlation

between two variables and possible pairs of variables was between 0.30 and 0.42. According to the described conditions, a multivariate analysis of variance was the most appropriate statistical procedure for comparing the investigated groups. Before considering the results of the multivariate analysis of variance, the homogeneity of covariance assumption was checked by the M-box test and it was found that the covariance matrix was homogeneous (P >0.05).

A multivariate analysis of variance test used to compare the patient and non-patient groups is shown in Table 2.

Table 2

Summary of the results of multivariate analysis of variance to compare patient and non-patient groups

Variable	Value	F	Hypothesis df	error df	Sig.	Partial Eta Squared
Pillay trace	0.947	39.95	12	27	0.000	0.94
Wilks` lambda	0.053	39.95	12	27	0.000	0.94
Hotelings trace	17.75	39.95	12	27	0.000	0.94
Roy's Largest Root	17.75	39.95	12	27	0.000	0.94

The results of Table 2 highlighted that there was a significant difference between the two groups of cardiovascular patients and non-patients in terms of the combination of dependent variables (P <0.01, F = 39.95, Wilkes lambda = 0.053). A significant difference could thus be seen between the studied groups in terms of at least one of the dependent variables.

To investigate the univariate differences in the study groups, first, the homogeneity of variance of each of the components of attachment, problem-solving, and anxiety sensitivity was examined using the Levin test. It was found that in each of the variables (components), the variances were homogeneous. (P >0.05)

In Table 3, the results of the univariate analysis of variance tests on each of the research variables are compared.

Table 3

Results of univariate analysis of variance of attachment, problem-solving, and anxiety sensitivity components in cardiovascular patients and non-patients

The dependent variable	SS	df	MS	F	Sig.	Eta Squared
Avoidance	57.60	1	15.60	25.21	0.000	0.39
Safety	216.25	1	216.25	152.86	0.000	0.80
Ambivalent	52.90	1	52.90	26.20	0.000	0.40
Helplessness	13.22	1	13.22	21.70	0.000	0.36
Control	16.90	1	16.90	35.28	0.000	0.48
Creative	28.90	1	28.90	53.31	0.000	0.58
Confidence	24.22	1	24.22	24.27	0.000	0.40
Avoidance	38.02	1	38.02	74.67	0.000	0.66
Approach	5.62	1	5.62	14.89	0.000	0.28
Social concerns	555.02	1	555.02	67.61	0.000	0.64
Mental incapacitation concerns	265.22	1	265.22	29.71	0.000	0.43
Physical concerns	507.02	1	207.02	41.63	0.000	0.52

The results of Table 3 demonstrated that avoidant, safety and ambivalent attachment were different in patients and non-patients: ($F_{s(1\&38)}$=25.21,152.26,86.20:P_s0<0.01). Likewise, helplessness, restraint, creativity, trust, avoidance and the tendency in patients as well as non-patients were different: ($F_{s(1\&38)}$=21.35,70.53,28.24,31.7427.14,67.89: P_s<0.01); Physical, cognitive, and social anxieties also varied in patients and non-patients:($F_{s(1\&38)}$=67.29,61.41,71.63: P_s<0.01).

4. Discussion

The results of the present study indicated that cardiovascular patients and non-patients used avoidant attachment styles differently and that cardiovascular patients used avoidant attachment styles more than non-patients. In a similar study on asthmatic patients, Fraley et al. (2000) concluded that there was a difference between avoidant attachment style in asthmatic patients and non-asthmatic individuals the results of which are consistent with the present study's. There was a positive relationship between avoidant attachment style and physical as well as mental illness symptoms (Mikulincer et al, 1999). In the present study, the results revealed that safety attachment styles showed the difference among cardiovascular patients and non-patients; additionally, non-patients adopted more safety attachment styles than cardiovascular patients. These results are in line with the findings of Mikulincer and Nachshon (1991). Mikulincer and Nachshon (1991) discovered that people with a safety attachment style were more competent in the workplace and social environment, enjoying better mental health. According to the present study's results, cardiovascular patients and non-patients had different ambivalent attachment styles and cardiovascular patients adopted ambivalent attachment styles more frequently than non-patients. These results correlate favorably with the Cassibba et al.

(2004) who further supported the idea that there was a positive relationship between ambivalent unsafe attachment style and the incidence of diseases. Thus the more ambivalent a person's attachment style is, the more likely he or she is to develop the disease (Cassibba et al., 2004).

The results highlighted that the problem-solving style of helplessness was different in cardiovascular patients and non-patients and cardiovascular patients used more helplessness problem-solving style than non-patients. The present study's results corroborate with Abdi's (2001) research. In a similar study on addicted patients and non-patient people, Abdi (2001) concluded that there was a significant difference between these two groups in the use of problem-solving styles. The results demonstrated that the problem-solving control was different in cardiovascular patients as well as non-patients and non-patients adopted the problem-solving control more than cardiovascular patients. These results are consistent with Abdi's (2001) research findings. This substantiates previous findings in the literature (Ball, 1998; Smith & Washousky, 1995). When a patient applies this type of problem-solving style, he or she pays more attention to how to manage influential external and internal factors. The results indicated that creative problem-solving style was different in cardiovascular patients and non-patients and non-patients adopted more creative problem-solving style than cardiovascular patients. These results are consistent with Abdi's (2001) research. These findings lend support to the previous findings in literature (Ball, 1998; Smith & Washousky, 1995). The results highlighted that the problem-solving confidence was different in cardiovascular patients and non-patients and non-patients adopted the problem-solving confidence more than cardiovascular patients. These results confirm Abdi's (2001) research and are in good agreement with (Ball, 1998; Smith & Washousky, 1995); The results of the present study illustrated that the avoidance problem-solving style was different in cardiovascular patients and non-patients and cardiovascular patients more than non-patients adopted avoidance problem-solving. This fits well with (Abdi, 200; Ball, 1998; Smith & Washousky, 1995). The results of investigating the relationship between problem solving, conflict resolution, and psychological health among students (Babapour kheiredin, 2002). Babapour kheiredin (2002) revealed that using such a problem-solving style, patients give up any effort and become passive and indifferent instead of thinking about their problems. The results of the present study illustrated that the problem-solving approach was different in cardiovascular patients and non-patients and non-patients' problem-solving style approach was higher than cardiovascular patients. This is in complete agreement with Abdi's (2001) study which highlighted that there was a significant difference between addicted patients and non-patients regarding problem-solving styles. These results are also consistent with other studies in literature (Abdi, 2001; Smith & Washousky, 1995).

The results demonstrated that physical concerns were different in cardiovascular patients and non-patients and cardiovascular patients had more physical concerns than non-patients. This study is in good agreement with Deacon and Abramowitz's (2006) research which highlighted that there was a significant

difference between anxiety patients and normal people when it comes to anxiety sensitivity. The results show that mental incapacitation concerns revealed the difference between cardiovascular patients and non-patients and that cardiovascular patients were more likely to have mental incapacitation concerns. These results are consistent with Anderson and Hope's (2009) research showing that there was a significant difference between anxiety patients and non-patients in terms of anxiety sensitivity; moreover, anxiety patients experienced more anxiety sensitivity and cognitive arousal. Anxiety sensitivity created a kind of cognitive bias concerning threatening stimuli increasing paying attention to related threatening stimuli which in turn increased the level of stimulation of perceived internal or external stimuli (Anderson & Hope, 2009). Researchers found that social concerns were different in cardiovascular patients and non-patients and that cardiovascular patients have higher social concerns than non-patients. These results are in good agreement with research by Rector et al. (2007). They expressed that there was a significant difference between anxiety patients and non-patients in terms of anxiety sensitivity so that anxiety patients experienced more anxiety sensitivity (Rector et al., 2007).

5. Conclusion

As the present study concentrated on cardiovascular patients in the city of Ardabil, the scope of generalization of the results of the research was limited**.** Moreover**,** methodological limitations included the inaccessibility to the participants; therefore, it was hard to find a sample. It was suggested that the present study be conducted in other cities to promote the generalizability of the results; additionally, other variables related to cardiovascular disease should get investigated and examined, such as personality traits, socioeconomic status, problems, and adverse life experiences. The results of the present study suggested that more attention need to be paid to attachment styles, problem-solving, and anxiety sensitivity and its consequences. Therefore, cardiovascular patients and non-patients should be informed about these issues. n addition, officials at health centers and hospitals as well as families, should hold meetings to improve attachment styles, problem-solving, and anxiety sensitivity and professionals should focus more on preventive measures as soon as possible without incurring financial or psychological damage to the patients. University, school, family counseling center, health center workshops, conferences, and specialized meetings are recommended as a method of increasing awareness, enhancing skills and improving attachments, problem-solving, as well as anxiety sensitivity.

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Conflict of interests

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Research Paper: The Relationship between Video Games and Cognitive Skills of Students

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Abstract

This research examined the relationship between video games and cognitive skills including critical thinking and creative thinking. This was an analytical and cross-sectional study. The population of the present research consisted of high school students of Ardebil in the academic year 2013-2014. A sample consisting of 105 students, (54 female and 51 male), was selected using multi-stage cluster sampling. They filled out two questionnaires, namely the California Critical Thinking Skill Test (CCTST) and Critical Thinking Test (CT). The data collected from the questionnaires were analyzed by SPSS through one-way analysis of variance (ANOVA) as well as the Scheffe test. To conduct the analysis, the participants were divided into four groups based on the number of hours spent playing video games every day, namely no gaming, less than 1 hour, between 1-2 hours, and more than 2 hours of gaming; they were also divided into four groups based on the number of years they had been playing video games, namely no gaming, less than a year, 1-2 years, and more than 2 years. The results of the one-way ANOVA revealed significant differences in creativity between the four groups based on the hours spent playing and the number of years the subjects had been playing video games ($P<0.05$). The differences between the four groups in terms of critical thinking were also significant ($P<0.05$). The findings indicated that the individuals spending up to two hours playing video games on a daily basis had higher levels of creativity and critical thinking compared to non-gamers.

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1. Introduction

Now a days life has undergone a fundamental transformation compared to life in the past centuries and millennia. Due to social, educational, economic and cultural complexities, the modern lifestyle requires special skills, one of which is higher-order thinking. Higher-order thinking can be described as a type of non-algorithmic, complex thinking, which often produces a variety of solutions. Different types of higher-order thinking have been identified so far, two of which are critical thinking and creative thinking (Miri et al., 2007).

Examining the current literature on critical thinking, Aloqaili (2012) concludes that there is lack of consensus over its definition. As argued by Romeo (2010, as cited in Aloqaili, 2012), a universal framework does not exist for critical thinking, and there is a dearth of knowledge and theoretical definition of the construct. However, some researchers have provided a number of definitions for the variable. For example, Andolina (2001, as cited in Hariri & Bagherinejad, 2012) defines critical thinking as a process in which the opinions, information and resources providing that information are assessed, regulated in a logical as well as coherent manner, and then associated with other pieces of information and opinions. During this process, other resources are considered and their implications are assessed. Ennis (1985, as cited in Aloqaili, 2012) defines critical thinking as logical, insightful thinking that focuses on what to believe and what to do. Mertes (1991, as cited in Topoğlu, 2014) defines critical thinking as a conscious, purposeful process used to interpret and assess information and experiences.

Some researchers have also proposed components for critical thinking. Branch (2000, as cited in Emir, 2009) believes that critical thinking has seven components: Curiosity, open-mindedness, orderliness, analyticity, rationality, confidence and truth-seeking. Popil (2010, as cited in Amirpour, 2012) describes individuals with critical thinking as being endowed with characteristics such as openness to new ideas, flexibility, desire to be changed, innovation, creativity, analyticity, audacity, tirelessness, enthusiasm, exuberance, risk-taking, knowledgeability, skillfulness, attentiveness, and mediation.

Another aspect of higher-order thinking is creativity. Creativity is a concept associated with differences among individuals. This concept has been coined to explain why some people have greater ability to work out solutions to problems (Jauk et al., 2013). Psychologists believe that creativity is not just innate or inherent, rather it can be acquired. Through training, children can be taught to work towards unorthodox solutions and resort to divergent thinking to address their problems and come up with proper solutions (Parsamansh & Sobhigharamaleki, 2013). Creativity has been so far defined in many ways. Sternberg (2001, as cited in Agahi Esfahani et al., 2004) defines creativity as a combination of innovation, flexibility and sensitivity towards ideas that make a person capable of seeking productive solutions; as a result, the person feels satisfied and others become gratified. Many researchers now provide a single definition of creativity. It is the ability to come up with fresh, useful ideas or solutions (Motyl & Filippi, 2014; Amabile, 1988; as cited in Chen et al., 2013; Zimmerer & Scarborough, 2008; as

cited in Antonio et al., 2014). As for the constituents and components of creativity, a body of research is available, too. For example, Amabile (1988, as cited in Chen et al., 2013) divides creativity into three components: Technical know-how, creative thinking skills and motivation. Torrance and Goff (1989, as cited in Abedi, 1993) define creativity as having four main components: 1) fluency that involves generating a great deal of ideas; 2) originality that involves the capacity to generate novel, unorthodox ideas; 3) flexibility that involves the capacity to generate many distinct ideas; and (4) elaboration that involves the capacity to pay attention to details.

At the turn of the 20th century, technological advances accelerated affecting the quality and nature of recreational activities. Video games first appeared in 1972, when *Pong* (an electronic game simulating table tennis) was released; then the industry began to grow in the domains of software and hardware. With an increase in the quality and variety of video games, they have gained increasing popularity among young people (Morrison & Krogman, 2001, as cited in Abdolkhaleghi et al., 2005). Although the introduction of video games took place with little delay in Iran, they are now popular especially among teenagers. For example, a study conducted by Amini et al. (2007) find that 53% of high school students play video games.

Although video games have been associated with negative outcomes such as aggressiveness (Sultanbayeva et al., 2013; Abdolkhaleghi et al., 2005), adverse behaviors (for example, Cheshmi & Zamani, 2011), depression (Lemola et al., 2011), and poor academic performance (Eow et al., 2009; Sharifi et al., 2011), other studies have stressed the useful aspects of video games. While considering the positive effects of video games, we should pay attention has mainly focused on the cognitive effects of them. Delbari et al. (2009) find that video games have a significant effect on intelligence quotient, simple reaction time, movement time, diagnostic reaction time and diagnostic movement time. Khalifeh and Ebrahimi Nobandegani (2012) find a relationship between gaming and creativity. However, another research in Iran indicates that video games reduce some dimensions of creativity in students (Gholami Toran Poshti & Karimzadeh, 2011). With regard to issues mentioned above and the existing literature, the purpose of this research is to investigate the relationship between video games and high school students' critical thinking and creativity.

2. Method

2.1. Sample and research process

The present study was an analytical and cross-sectional research. The population of the research consisted of high school students of Ardebil in the academic year 2013-2014. A sample consisting of 105 students, 54 female and 51 male, was selected from four schools using multi-stage cluster sampling.

2.2. Research tools

Creativity Test (CT): The creativity test has been devised by Abedi (1984) building on the Torrance Theory of creativity. This questionnaire was revised several times, and finally, a version consisting of 60 questions was developed by Abedi at the University of California. Each question has

three choices, and the test is divided into four sub-tests, namely fluidity, elaboration, originality and flexibility. Each choice receives a score ranging from 1 to 3 representing low, moderate and high creativity, respectively. The total score of each sub-test represents the score obtained by the subjects in that section. The total score of each subject in four sub-scales represents his/her creativity. The total score of creativity for each subject ranges from 60 to 180. The questions 1-22 are related to fluidity, 23-33 to elaboration, 34-49 to originality, and 50-60 to flexibility. The reliability coefficient of fluidity was 0.85, originality 0.82, flexibility 0.84, and elaboration 0.80 (Abedi, 1993). In a study carried out on 2270 Spanish students to determine the validity and reliability of the creativity test, Cronbach's alpha coefficient was 0.75 for fluidity, 0.66 for flexibility, 0.61 for originality and 0.61 for elaboration (Auzmendi, Villa & Abedi, 1996).

The California Critical Thinking Skills Test, Form B: This questionnaire that was developed and assessed by Facione in 1990 (as cited in Hariri & Bagherinejad, 2012) has 34 items; some of them have four and some have five choices. In each item, there is only one correct answer, with the maximum score of a person as 34. Five components of critical thinking assessed in this questionnaire include analysis, evaluation, inference, inductive reasoning and deductive reasoning. Analysis includes 9 items, evaluation includes 14 items, inference includes 11 items, inductive reasoning includes 15 items and deductive reasoning includes 15 items. The specified mean of this test is 15.89

2.3. Data analysis

The collected data were analyzed by SPSS 22.0. In the descriptive statistics, mean, standard deviation, frequency and percentage were calculated. In the inferential statistics, one-way ANOVA and Scheffe post-hoc analysis were used to compare the scores of critical thinking and creative thinking among different groups.

3. Results

A total of 51 male students (48.6%) and 54 female students (51.4%) participated in this research. The mean age of the students was 16.77 with the standard deviation of 2.50. Among the participants, 69 (65.7%) played video games, 35 participants (33.3%) played less than an hour, 18 (17.1%) played between 1-2 hours, and 16 (15.23%) played more than 3 hours on a daily basis. Out of the 69 participants, 28 (26.7%) had been playing video games less than a year, 17 (16.2%) between 1-2 years and 24 (22.9%) more than 2 years.

After running the one-way ANOVA, the results illustrated a significant difference in creativity between the four groups of no use, less than an hour, between 1-2 hours, and more than 2 hours ($F=5.61$, $P < 0.001$). To find out which groups are responsible for differences, the Scheffe post-hoc test was conducted (Table 1).

Table 1

Scheffe test to compare creativity in four groups based on daily hours spent playing video games

Variables	Hours	hours	Mean difference	Standard deviation	Significance
Creativity	No use	Less than 1 hour	-7.54	2.63	0.048
		1-2 hours	-11.47	3.20	0.007
		2 hours and more	-9.15	3.33	0.063
	Less than 1 hour	1-2 hours	-3.93	3.21	0.685
		2 hours and more	-1.61	3.35	0.972
	1-2 hours	2 hours and more	2.31	3.81	0.946

According to table 1 and based on the Scheffe test, there was a significant difference between non-gamers and individuals playing video games less than 1 hour, between 1 and 2 hours regarding creativity ($P < 0.10$).

There was also an observed significant difference between individuals playing video games less than 1 hour and individuals playing video games 2 hours and more ($P < 0.10$).

The results of the one-way ANOVA showed a significant difference in creativity between the four groups of no use, less than a year, between 1-2 years, and more than 2 years ($F=16.55$, $P < 0.001$). Table 2 represents the results of the post-hoc Scheffe test.

Table 2

Scheffe test to compare creativity in four groups based on the number of years of playing video games

Variables	Year	Year	Mean difference	Standard deviation	Significance
Creativity	No use	Less than 1 Year	-6.13	2.47	0.111
		1-2 years	-14.94	2.88	0.001
		Up to 2 years and more	-16.09	2.58	0.001
	Less than 1 Year	1-2 years	-8.80	3.01	0.042
		Up to 2 years and more	-9.95	2.73	0.006
	1-2 years	Up to 2 years and more	-1.14	3.11	0.987

The results of the Scheffe test (table 2) illustrated that there was significant difference between non-gamers and individuals playing video games between 1-2 years with regard to creativity ($P < 0.10$). In the case of individuals playing video games less than 1 Year compared to individuals playing video games up to 2 years and more as well as between 1 and 2 years, the significant difference was seen ($P < 0.10$).

Moreover, taking creativity into consideration, the significant difference was observed between individuals playing

video games with the duration of 1-2 years and individuals playing video games up to 2 years and more (P < 0.10).

The results of the one-way ANOVA showed a significant difference in critical thinking between the four groups of no use, less than an hour, between 1-2 hours, and more than 2 hours (F=4.91, P = 0.003). To find out which groups are responsible for differences, the scheffe post-hoc test was also conducted (Table 3).

Table 3

Scheffe test to compare critical thinking in four groups based on the hours of playing video games

Variables	Hours	Hours	Mean difference	Standard deviation	Significance
critical thinking	No use	Less than 1 hour	-3.26	1.09	0.035
		1-2 hours	-4.38	1.32	0.015
		2 hours and more	-3.11	1.38	0.173
	Less than 1 hour	1-2 hours	-1.11	1.33	0.872
		2 hours and more	0.15	1.38	0.999
	1-2 hours	2 hours and more	1.27	1.58	0.886

The results of the Scheffe test (table 3) indicated that there was a significant difference between non-gamers and individuals playing video games less than 1 hour with regard to critical thinking (P < 0.10). Based on table 3, there was a significant difference between non-gamers and individuals playing video games between 1-2 years with regard to critical thinking (P < 0.10).

The results of the one-way ANOVA showed a significant difference in critical thinking between the four groups of no use, less than a year, between 1-2 years, and more than 2 years (F=4.31, P = 0.007).

Table 4

Scheffe test to compare critical thinking in four groups based on the number of years of playing video games

Variables	Year	Year	Mean difference	Standard deviation	Significance
critical thinking	No use	Less than 1 Year	-2.69	1.16	0.159
		1-2 years	-2.56	1.36	0.321
		Up to 2 years and more	-4.20	1.22	0.010
	Less than 1 year	1-2 hours	0.12	1.42	0.999
		Up to 2 years and more	-1.51	1.29	0.710
	1-2 years	Up to 2 years and more	-1.63	1.47	0.743

Table 4 indicated that there was a significant difference only between individuals playing video games less than 1 year and individuals playing video games up to 2 years and more taking critical thinking into consideration ($P < 0.10$).

4. Discussion

Since the popularity of video games have been on the rise in recent years, their positive and negative effects should necessarily be identified. The purpose of this research was to examine the relationship between playing video games, creativity and critical thinking.

The results presented a significant difference in creativity between the students who did not play games and the ones who played up to two hours on a daily basis. The students who played longer were proved to be more creative. The findings were consistent with some relevant research. Gackenbach and Dopko (2012) stressed that having a record of playing video games is related to some aspects of creativity. The findings are similar to those of other studies carried out by Khalifeh and Ebrahimi Nobandegani (2012) and Jauk et al. (2013). Higher-order thinking can be described as a type of non-algorithmic, complex thinking, often producing a variety of solutions. Creativity is a kind of higher-order thinking which can be improved by engaging in some activity (Miri et al., 2007). Salinous-Pesternak (2005, as cited in the Khalifeh and Ebrahimi Nobandegany, 2012) argued that video games would enrich and diversify the games played by kids and teenagers and that they can provide various problem-solving methods, helping to improve students' cognitive skills.

The findings also demonstrated a significant difference in critical thinking between the students who did not play games and the ones who played up to two hours on a daily basis; meanwhile, the students using video games for a longer period of time were better at critical thinking. Although there has been a wealth of research on the relationship between creativity and video games, the link between critical thinking and video games is yet to be sufficiently investigated into. Nowadays, there is a consensus on this issue that critical thinking is a skill that can be improved (Miri et al., 2007).

5. Conclusion

Totally it can be concluded that video games have both positive and negative aspects. Two of the positive aspects are critical thinking and creativity. It is noteworthy to emphasize that students gaming up to two hours a day experience an increase in creativity and critical thinking, but longer periods of gaming do not affect these variables. However, creativity and critical thinking increase as the number of years of gaming increases.

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