

Correlation between Reactive Aggression in Deaf and Hard-of-Hearing Children and Maternal Self-Handicapping: The Mediating Role of Maternal Chronic Fatigue

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Received: March 01, 2023; Revised: April 24, 2023; Accepted: May 30, 2023

Abstract

Background: Stress and mental pressure in challenging situations, particularly those involving deaf or hard-of-hearing (DHH) children, can profoundly impact mothers. This research investigated the mediating role of maternal chronic fatigue (CF) in the relationship between reactive aggression in DHH children and maternal self-handicapping.

Methods: This study employed a descriptive correlational research design. The statistical population of this research included all mothers and their DHH elementary school children studying at special education centers in Ahvaz, Khuzestan Province, Iran, during the academic year 2022–2023. The convenience sampling method was used to select a sample of 202 mothers with DHH children. Data collection involved the Reactive-Proactive Aggression Scale, Self-Handicapping Questionnaire, and Chalder Fatigue Scale. Data analysis was conducted using the Pearson correlation test and structural equation modeling with AMOS version 24 and SPSS version 27.

Results: The mean and standard deviation of DHH children's reactive aggression, maternal self-handicapping, and chronic fatigue were 20.37 ± 4.84 , 54.55 ± 11.16 , and 21.47 ± 6.12 , respectively. The results revealed a significant correlation between self-handicapping and CF in mothers and between CF in mothers and reactive aggression in children ($P=0.001$). Reactive aggression in DHH children was significantly correlated with their mothers' self-handicapping, mediated by maternal CF ($P=0.010$). The analysis did not yield statistically significant evidence supporting the correlation between maternal self-handicapping tendencies and their children's reactive aggression. Based on the results, the model's fit indices, including NFI, CFI, TLI, RFI, and RMSEA, were 0.98, 0.99, 0.99, 0.97, and 0.022, respectively.

Conclusion: Consequently, the final modified model exhibited a good fit based on the research findings. Analyzing these correlations presents an opportunity to discern the factors contributing to reactive aggression in DHH children, thereby facilitating the development of appropriate therapeutic interventions.

Keywords: Aggression, Hearing loss, Fatigue, Self-handicapping, Mothers

How to Cite: Raeisi E, Safarzadeh S, Bakhtiarpour S, Heidari AR. Correlation between Reactive Aggression in Deaf and Hard-of-Hearing Children and Maternal Self-Handicapping: The Mediating Role of Maternal Chronic Fatigue. *Women. Health. Bull.* 2023;10(3):191-199. doi: 10.30476/WHB.2023.99693.1240.

1. Introduction

Deafness and hearing loss represent humans' most conspicuous sensorineural impairments (1). Approximately, 7 out of every 1000 individuals experience severe to profound hearing loss, and 1 out of every 750 children has bilateral dominant hearing impairment, with a hearing loss exceeding 40 dB (2). The prevalence of hearing loss among Iranian infants has been reported as 1.2 per thousand births (3). Both deaf children and their parents contend with adverse developmental consequences in areas such as communication, cognition, and emotional-social functioning due to severe and profound hearing loss (4). Nevertheless, the effects of hearing loss can fluctuate in type and

severity depending on various factors, including the degree of hearing loss, the efficacy of hearing aids or cochlear implants, parental resources, family roles, IQ, the presence of other disabilities, and the quality of educational interventions (5). As a result of their inability to exert control or dominance over their immediate environment, deaf or hard-of-hearing (DHH) children may encounter distinct challenges when attempting to communicate their needs. They may experience difficulties in garnering the attention of others.

Consequently, these children exhibit aggressive behavior when faced with hunger, fatigue, or distress (6). Aggression is a multifaceted concept encompassing various behaviors with varying

functions and multiple antecedents (7). Aggression is commonly defined as behavior intended to cause physical or mental harm to a person or their property (8, 9). Research findings indicated a higher prevalence and greater intensity of aggression and depression among DHH children and adolescents compared to their peers with normal hearing abilities (10). According to the findings of the study conducted by Brown and Cornes (11), DHH students reported elevated mental health issues compared to their hearing counterparts.

A functional approach has been employed in recent decades to categorize and describe aggressive behaviors. This approach seeks to elucidate the role of an individual's internal motivation in driving aggressive behavior. Aggression can be classified into reactive and proactive subtypes based on the situation and the individual's motivation for aggressive acts (12). Evans and Fite (13) delineated that reactive aggression constitutes an emotional response triggered by the perception of a threat. Proactive aggression is more frequently observed in individuals with externalizing disorders, such as antisocial behavior, and those with frequent and excessive substance use (13).

As per the family-based schema theory, children's beliefs and expectations are shaped by their exposure to tense family situations. The child's memory stores these internal representations as relational schemas or cognitive structures, which can lead to the misinterpretation of environmental cues (14). Consequently, when confronted with tense circumstances, these cognitive structures activate and influence social perception and behavior, ultimately resulting in the child's display of aggressive reactions. Therefore, parents, particularly mothers, play a significant role in the emergence and persistence of aggressive behavior. Fernández-González and colleagues (15) demonstrated cross-sectional and longitudinal associations between child-to-parent violence, dating violence among high school students, and aggressive behavior.

A child's aggressive behavior may be accompanied by psychological characteristics in the mother, such as a propensity to engage in self-handicapping behaviors. Self-handicapping is deliberately engaging in behaviors or abstaining from actions to create justifications or excuses (16). Asserted self-handicapping involves verbal

attempts to justify the reasons for failure to evade questioning and blame. Self-handicapping entails adopting actions that increase the likelihood of externalizing failure and internalizing success while shielding the individual from the adverse consequences of failure (17). In their study, Rahmati and colleagues (16) established a correlation between maternal propensity to engage in self-handicapping behaviors and the occurrence of aggression and behavioral problems in their children.

Stress and mental pressure, particularly in challenging situations involving DHH children, can significantly impact mothers. One of the complications that may arise is chronic fatigue syndrome. Chronic fatigue (CF) is a complex multi-system condition that can result in prolonged fatigue and disability, adversely affecting academic performance and personal and social activities (18). The symptoms of this condition manifest rapidly and persist chronically for several years (19). Fisher and colleagues (20) and Masoumi and colleagues (21) found a higher prevalence of CF among both mothers and fathers of disabled children compared to mothers of typically developing children.

The presence of children with hearing impairment in the family and the challenges associated with their education and social communication can present difficulties for mothers in fulfilling their supportive role (22). It is acknowledged that having a child with special needs is often associated with significant stress on the family. The extent of vulnerability to this stress can sometimes be severe, profoundly impacting the mental health of all family members. Few studies analyzed the family environment concerning conflicts involving a child with special needs and its relationship with the incidence of aggressive behaviors (14). Moreover, these studies have not comprehensively considered key variables or explored the effects of other factors. Research on aggression related to exposure to social violence examined the distinct functions of aggression or accounted for the combined influence of family environment factors and other individual variables (16). Consequently, this study aimed to investigate the mediating role of maternal CF in the correlation between the reactive aggression of DHH children and maternal self-handicapping. In line with the research background, we proposed a conceptual model in Figure 1.

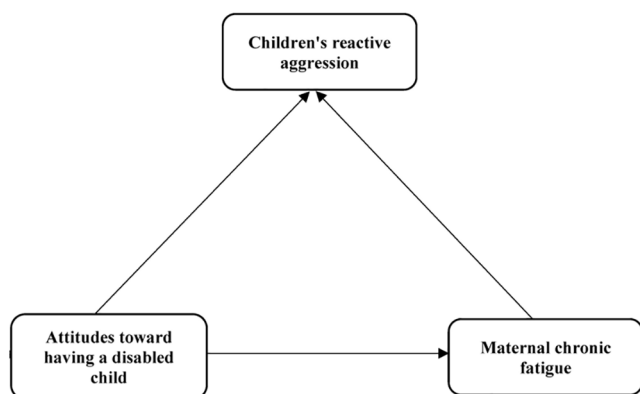


Figure 1: The figure shows the conceptual model of research.

2. Methods

This study utilized a descriptive correlational research design. The statistical population encompassed all elementary school children with hearing impairments (DHH) attending special education centers affiliated with the Department of Special Education in Khuzestan Province during the academic year 2022–2023, along with their mothers. The convenience sampling method was employed to select 202 mothers of DHH children. Following Wolf and colleagues' recommendation (23), the sample size was determined based on the research variables ($n=190$). This study adjusted the sample size to 209 for a 10% attrition rate.

The inclusion criteria comprised children aged 7–12 years, enrollment in primary school, the absence of any other developmental disorders in the children, and the absence of any psychological disorders in the mothers. Incomplete questionnaires and reluctance to continue participation were considered as exclusion criteria.

2.1. Procedure

Before commencing the research, ethics approval was obtained from the Ethics Committee of the Ahvaz Branch, Islamic Azad University, with the code of IR.IAU.AHVAZ.REC.1402.026. Initially, we compiled a roster of Deaf and Hard of Hearing (DHH) education centers affiliated with the Department of Special Education in Khuzestan Province. Subsequently, we employed this roster to enroll 215 eligible participants. Following selecting eligible mothers for the study, we conducted an explanatory meeting to elucidate the research's purpose, after which informed consent was duly acquired.

Subsequently, we provided research questionnaires to the mothers and requested their responses. After meticulous data collection and examination, 13 questionnaires were excluded from the analysis due to incomplete information. Ultimately, we analyzed 202 questionnaires. Additionally, this study utilized three instruments:

2.1.1. Reactive-Proactive Aggression Scale: Developed by Dodge and Coie (24), this scale comprises two subscales: reactive aggression and proactive aggression. Mothers were requested to complete the 19-item scale for their children. In this research, the reactive aggression subscale, consisting of 7 statements, was utilized. Each item is rated on a Likert scale ranging from 1 (indicating very little deficiency) to 5 (indicating very high deficiency). The minimum and maximum score of the reactive aggression subscale are 7 and 35, respectively. Rezaei and Dehghani (25) reported a Cronbach's alpha coefficient of 0.81 for the Reactive-Proactive Aggression Scale. The validity of the Persian version of the scale was affirmed by Rezaei and Dehghani (25) (CVI=0.92, CVR=0.96). In this study, the Cronbach's alpha of the scale was 0.83.

2.1.2. Self-Handicapping Questionnaire: The scale developed by Jones and Rhodewalt (26) measures people's tendency toward self-handicapping. It consists of responses ranging from strongly agree to strongly disagree, with a scale of 0 to 5, respectively. The original version of the Self-Handicapping Questionnaire comprises 23 items and is divided into three subscales. The first subscale, consisting of 9 items, assesses negative mood (items 20, 19, 15, 13, 9, 8, 7, and 4). The second subscale, comprising 7 items, measures effort (questions 22, 21, 17, 10, 3, 6, and 5). The third subscale, consisting of 7 items, measures excuse-making (questions 18, 16, 14, 12, 11, 2, and 1). Yazdizadeh and colleagues (27) reported a Cronbach's alpha coefficient of 0.77 for the Self-Handicapping Questionnaire. The content validity of the Self-Handicapping Questionnaire was confirmed with a CVR of 0.91 and a CVI of 0.89 (27). In this study, the Cronbach's alpha of the questionnaire was 0.78.

2.1.3. Chalder Fatigue Scale: Developed by Chalder and co-workers (28), this scale consists of a brief instrument containing 14 items that assess psychological and physical fatigue indicators. The items are rated on a 4-point Likert scale from

0 to 3. This scale includes physical fatigue (mean score of items 1 to 8) and psychological fatigue (mean score of items 9 to 14). The minimum and maximum scores on this scale are 0 and 42, respectively, with a cutoff score of 14. Sakkaki and colleagues (18) reported a Cronbach's alpha coefficient of 0.87 for the Chalder Fatigue Scale. The scale's content validity was confirmed with a CVI of 0.90 and a CVR of 0.88 (18). In this study, the Cronbach's alpha of the scale was 0.89.

2.2. Data Analysis

The research's proposed model underwent evaluation through structural equation modeling in SPSS version 27 and AMOS version 24. The Pearson correlation coefficient was also employed to assess the relationships between variables.

3. Results

Concerning demographic variables, 102 (50.50%) of the children were female, while 100

(49.50%) were male. Furthermore, 125 (61.88%) mothers held high school diplomas, and 77 (37.12%) had university degrees. Of the mothers, 45 (22.28%) were employed, while 157 (77.72%) were homemakers. Table 1 presents the studied variables' mean, standard deviation (SD), and Pearson correlation coefficient values.

The Pearson correlation coefficient results analysis indicated significant correlations among all the variables ($P < 0.01$). The initial proposed model aimed to elucidate the reactive aggression observed in DHH children, explicitly focusing on examining the influence of maternal self-handicapping tendencies and maternal CF (Figure 2).

As per Table 2, the initial model's root mean square error of estimation equated to $RMSEA = 0.082$, signifying the need for model adjustment. In order to modify the model, we removed the path from self-handicapping to aggression. The final model, illustrated in Figure 3, displayed a good fit.

Table 1: Descriptive data and correlation coefficients of the research variables

| Variables | Mean±SD | Children's reactive aggression | Maternal self-handicapping | Maternal chronic fatigue |
|--------------------------------|-------------|--------------------------------|----------------------------|--------------------------|
| Children's reactive aggression | 20.37±4.84 | 1 | | |
| Maternal self-handicapping | 54.55±11.16 | 0.52** | 1 | |
| Maternal chronic fatigue | 21.47±6.12 | 0.52** | 0.69** | 1 |

** $P < 0.01$

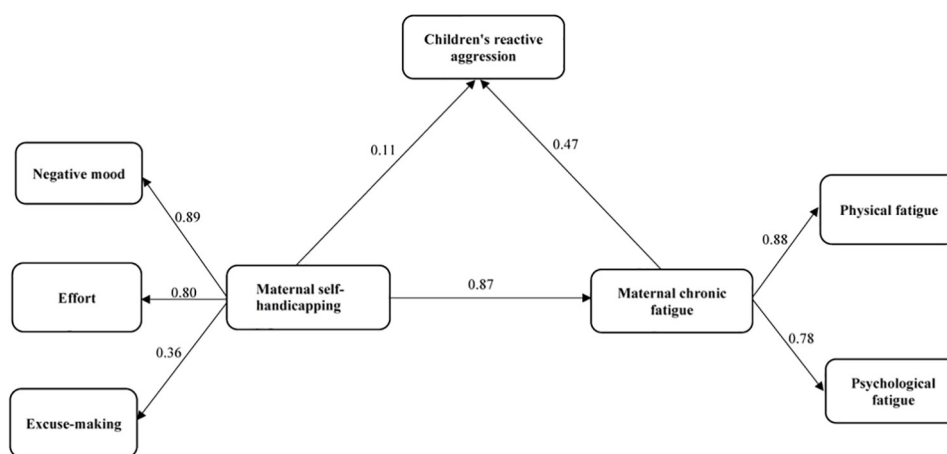


Figure 2: The figure shows the proposed model in standard mode.

Table 2: Fit indices of the tested research model

| Fit indicators | χ^2 | df | (χ^2/df) | TLI | CFI | RFI | NFI | RMSEA |
|----------------|----------|----|---------------|------|------|------|------|-------|
| Initial model | 8.46 | 7 | 1.21 | 0.97 | 0.99 | 0.94 | 0.98 | 0.082 |
| Final model | 8.79 | 8 | 1.01 | 0.99 | 0.99 | 0.97 | 0.98 | 0.022 |

TLI: Tucker–Lewis index; CFI: Comparative Fit Index; RFI: Relative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation

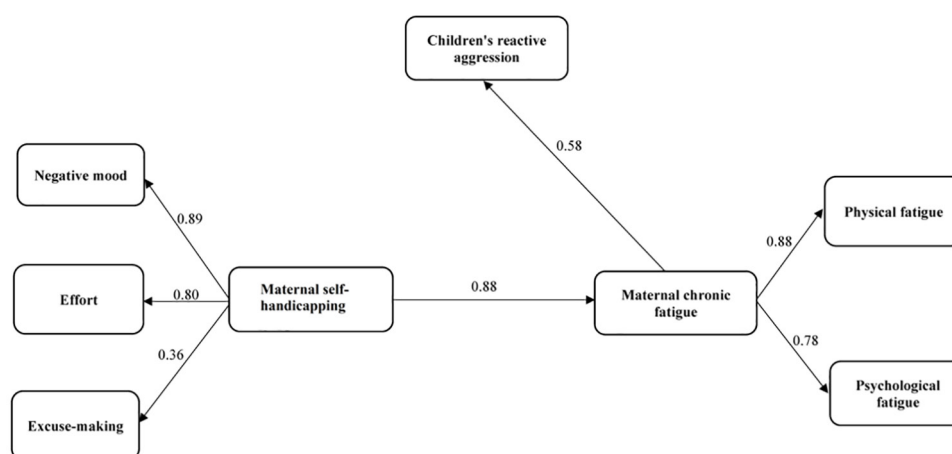


Figure 3: The figure shows the final model in standard mode.

Table 3: Direct and indirect path in the final model

| Path | Path type | β | P |
|--|-----------|---------|-------|
| Maternal self-handicapping → Children's reactive aggression | Direct | 0.11 | 0.562 |
| Maternal self-handicapping → Maternal chronic fatigue | Direct | 0.88 | 0.001 |
| Maternal chronic fatigue → Children's reactive aggression | Direct | 0.58 | 0.001 |
| Maternal self-handicapping → Children's reactive aggression through maternal chronic fatigue | Indirect | 1.79 | 0.010 |

The findings unveiled a significant correlation between self-handicapping and CF in mothers ($\beta=0.88$, $P<0.001$), as well as between CF in mothers and reactive aggression in children ($\beta=0.58$, $P<0.001$). However, the results did not provide statistically significant evidence supporting a correlation between maternal self-handicapping tendencies and their children's reactive aggression ($\beta=0.11$, $P=0.562$). Table 3 illustrates the indirect path from maternal self-handicapping to reactive aggression in DHH children, with maternal CF acting as a mediator ($\beta=1.79$, $P=0.010$) (Table 3).

4. Discussion

The present study aimed to investigate the mediating role of maternal CF (Coping Fatigue) in the correlation between the reactive aggression of DHH (Deaf or Hard of Hearing) children and maternal self-handicapping. Maternal self-handicapping and children's reactive aggression were found to have no significant correlation. This finding contradicts the research findings reported by Rahmati and colleagues (16), who demonstrated a correlation between maternal self-handicapping and children's aggression and behavioral problems. The reason can be found in different analyses conducted in the two studies. In both studies, Pearson analysis revealed a significant correlation between maternal self-handicapping and their children's aggression. The present study initially

utilized Pearson's analysis to establish a significant association between maternal self-handicapping and their children's aggression. Although maternal self-handicapping contributed to children's aggression, the mediator variable of CF was found to account for the entire contribution.

One should consider the concept and outcomes of self-handicapping in mothers to understand this finding better. Self-handicapping is recognized as one of the five symptoms of depression. It contributes significantly to low mood and the inability to derive pleasure from activities that were once enjoyable (17). This factor is integral to diagnosing and treating major depressive disorder (27). At the same time, previous research demonstrated a significant correlation between self-handicapping and emotional numbness (29). In the context of the current research, when the mother fails to derive pleasure from her environmental, family, communication, and social conditions, and none of these factors manage to evoke positive emotions, she resorts to ineffective strategies in the face of life's disappointments. As a result, these adverse and detrimental strategies seep into her interactions with family members and her child.

Mother-child relationships are crucial and impactful for children. As is evident from the term "communication," effective communication and interaction require a bilateral exchange. Hence,

when the child seeks sensation, but the mother fails to respond, the child's interaction with the mother becomes disrupted (30). When children exhibit a behavior, response, or emotion, they anticipate their mother's response to this action (16). A reaction must follow every action in human communications to sustain the interaction. Therefore, when the child repeatedly expresses emotional impulses without receiving a response from the mother, who is the primary source of the child's attachment and safety, the child adjusts the cognitive process associated with emotional impulse expression (4). This adjustment also extends to their overall emotional interactions with the mother. The child's emotional interactions are shut down due to not receiving an answer (14). Given the significant role of emotional interactions in a child's development process, the abovementioned shutdown can lead to emotional dysfunction, manifesting as behavioral problems (16). Therefore, maternal self-handicapping was significantly correlated with the child's reactive aggression.

The results indicated a significant correlation between maternal CF and children's reactive aggression. More specifically, the CF of the mother exhibited a positively significant correlation with the reactive aggression displayed by children with hearing impairments. This finding is consistent with the research conducted by Fisher and colleagues (20), which demonstrated that the CF level was higher in mothers of disabled children than in mothers of normal children. Fatigue is one of the responses exhibited by mothers of deaf children. Fatigue or feelings of tiredness are commonly associated with elevated levels of negative affect, e.g., anger, depression, and anxiety. Numerous reports identified fatigue as a prevalent and persistent emotional state lasting long (18, 19).

Additionally, fatigue correlates with diminished meaning in life, self-actualization, and self-expression (28). Children's hearing problems perpetuate a negative cycle of parent-child interactions, which often remain unaddressed (4).

Therefore, mothers experience an increased mental burden and fatigue. In other words, as a result of their children's hearing impairments, mothers cannot effectively apply the principles of education and punishment (21). The question of how to reduce negative behaviors and increase positive behaviors in children with hearing problems places

a significant psychological burden on mothers. Parents, particularly mothers, often experience heightened psychological pressures when a child is diagnosed with hearing impairment. These pressures can result in various reactions, including psychological trauma, disappointment, anger, and depression. With the emergence of parents' natural defensive reactions, one can observe a rise in certain behaviors. Such an event is exhausting and psychologically taxing on parents.

The results revealed a significant correlation between maternal self-handicapping and DHH children's reactive aggression, with maternal CF as a mediator. The researcher did not find any similar research available regarding this finding. Initially, the results indicated no significant connection between the self-handicapping of mothers and the reactive aggression of children with hearing impairments. However, in the indirect path, the results indicated that maternal self-handicapping was associated with increased CF in the mother. Hence, maternal self-handicapping will likely result in reactive aggression in children and a decrease in positive mother-child interactions. Based on the findings, it can be concluded that maternal CF has effectively served as a mediating variable in the connection between maternal self-handicapping and reactive aggression of DHH children. In addition to the mental stress it imposes on the family, the presence of a disabled child causes various physical diseases, including pain, and mental disorders such as depression and anxiety (4). Indeed, parents may experience a mental disorder, feelings of worthlessness and guilt, impaired physical function, and fatigue. The presence of a disabled child can limit a family's social relationships (31). Additionally, the severity of the disability can further restrict free time and the range of social communication. The parents experience greater psychological helplessness as social relations within this group of families decrease (32).

4.1. Limitation

Exercise caution when extrapolating the results to Deaf and Hard of Hearing (DHH) individuals in different geographical regions, as this study's statistical sample was confined to mothers of DHH children under the purview of the Department of Special Education in Khuzestan Province, Iran. Another limitation of this research lies in using

self-report tools, potentially affecting the precision of findings due to participants' inclination towards social desirability bias. Furthermore, the limited number of participating mothers and the lack of investigation into research variables concerning fathers of DHH children warrant caution when applying the research findings to other statistical communities. It is therefore advisable to consider other influential variables, such as the number of children, length of marriage, and mothers' economic status, when comparing the findings with those of the present study.

5. Conclusion

Considering the firm fit of the final model presented in this research, it can be regarded as a significant scientific innovation and discovery that holds the potential to mitigate reactive aggression in DHH children effectively. In light of the findings from numerous studies, it is recommended that comprehensive treatment programs be formulated to address the influence of family dynamics and parent-child interactions, especially interactions involving mothers, on the development of psychological disorders in children. These programs should also consider other influential factors contributing to behavioral problems, particularly aggression. By doing so, the objective is to enhance the efficacy of treatment strategies and ultimately elevate the quality of care for this specific cohort of children. In sum, given the substantial correlations between the research constructs, these correlations can be leveraged to devise effective strategies for alleviating issues stemming from dysfunctional family relationships and to bolster parents' rational approaches to addressing such concerns within specialized clinics.

Authors' Contribution

Elham Raeisi: Substantial contributions to the conception and design of the work, the acquisition, analysis, and interpretation of data for the work, reviewing the work critically for important intellectual content. Sahar Safarzadeh: Substantial contributions to the conception and design of the work, the acquisition, analysis, and interpretation of data for the work, reviewing the work critically for important intellectual content. Saeed Bakhtiarpour: Substantial contributions to the conception and design of the work, the acquisition, analysis, and interpretation of data

for the work, reviewing the work critically for important intellectual content. Alireza Heidari: Substantial contributions to the conception, drafting the work and reviewing it critically for important intellectual content; All authors have read and approved the final manuscript and agree to be accountable for all aspects of the work, such as the questions related to the accuracy or integrity of any part of the work.

Ethical Approval

The Ethics Review Board of the university approved the present study with the code of IR.IAU.AHVZ.REC.1402.026. Also, written informed consent was obtained from the participants.

Acknowledgement

This article was extracted from a part of the PhD dissertation of Mrs. Elham Raeisi in the Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran. The authors would like to appreciate the collaboration of all women in the present study.

Funding: Self-funding.

Conflict of interests: None declared.

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