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Predicting Domestic Violence a Based on the Cognitive Self-assessment, Sexual Assertiveness, and Perceived Social Support among Infertile Women: A Predictive Correlational Study

Maryam Mataji Amirroud (PhD)[1*], Ali Ramezankhani (PhD)[2], Hamid Joveyni (PhD)[3], Neda Izadi (PhD)[4]

[1] PhD in Health Education & Health Promotion, Department of Public Health, Faculty of Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2] Professor, Department of Public Health, Faculty of Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[3] Associate Professor, Department of Health Education and Public Health, School of Health, Sabzevar University of Medical Sciences, Sabzevar, Iran
[4] Assistant Professor of Epidemiology, Research Center for Social Determinants of Health, Research Institute for Endocrine Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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ABSTRACT

Background & aim: Infertility increases the risk of violence against women, necessitating an understanding of predictors of such violence. This research aimed to predict domestic violence in infertile women based on cognitive self-assessment, sexual assertiveness, and perceived social support.

Methods: This predictive correlational study involved 248 infertile women in Urmia City over six months (September 2022 - February 2023). Participants were selected through convenience sampling based on inclusion criteria. Data were collected via self-report questionnaires assessing spousal abuse, self-efficacy, self-esteem, sexual assertiveness, and perceived social support. Analysis was conducted using SPSS software (2020), employing descriptive and analytical tests, including Pearson correlation and multivariate regression.

Results: The prevalence of domestic violence among infertile women was 36.06% ± 10.51%. A significant negative correlation was found between predictor variables and domestic violence: self-efficacy ($P < 0.01$), self-esteem ($P < 0.01$), sexual assertiveness ($P < 0.01$), family support ($P < 0.01$), friends support ($P = 0.041$), significant other support ($P = 0.024$), and total perceived social support ($P < 0.01$). The adjusted coefficient of determination was 0.607, indicating that these predictors accounted for about 60% of the variance in domestic violence, with self-esteem showing the highest regression coefficient (beta = 0.623).

Conclusion: Self-esteem, self-efficacy, sexual assertiveness, and strong family support are crucial in predicting violence risk among infertile women. Enhancing these factors can mitigate violence and improve their well-being.

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Introduction

Infertility represents a significant global health challenge, affecting approximately 8–10% of couples worldwide (1). It is defined as the inability to achieve a clinical pregnancy after 12 months or more of regular unprotected intercourse (2). The prevalence of infertility

* *Corresponding author*: Maryam Mataji Amirroud, PhD in Health Education & Health Promotion, Department of Public Health, Faculty of Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Tel; 00989148169616; Email: mataji2009@gmail.com

varies among regions, with recent studies indicating that in Iran, the estimated prevalence of primary infertility increased from 17.3% in 2014 to 20.2% in 2019 (3-4). Similarly, the World Health Organization (WHO) estimates that approximately 186 million women in developing countries are affected by infertility (5). In terms of etiological distribution, the causes of infertility are almost evenly split between males and females; both partners are involved in roughly 20% of cases, with female factors accounting for approximately 40.3% and male factors for 39.9% in Iran (6). Despite this balance, women often bear the social and psychological burden of infertility, frequently facing social stigma, economic hardship, and marital conflicts (7).

The psychological and social impacts of infertility are profound. A considerable body of research links infertility with adverse mental health outcomes, including heightened levels of anxiety, depression, and psychological distress (8). For example, in Iran, a study found that 58% of infertile women experience some degree of depression, with 21% progressing to clinical depression (9). The societal stigma surrounding childlessness exacerbates these mental health issues, especially among women aged 34–36, who encounter intense social and marital pressures (10). Moreover, infertility is associated with increased vulnerability to domestic violence, particularly in societies where motherhood is closely linked to a woman's social status. In these environments, childless women frequently face physical, psychological, and economic violence, which reinforces gender inequalities and marginalization (14). Studies indicate that approximately one-third of women experience violence, with 78% reporting that their first violent incident occurred after their diagnosis of infertility (11-12). The impact of violence on women's health extends beyond immediate physical harm. Violent acts are significant risk factors for adverse mental health outcomes, including heightened stress, depression, and feelings of powerlessness, while also limiting access to healthcare and increasing engagement in high-risk behaviors such as smoking and alcohol use (13-15). Infertile women are particularly susceptible to psychological crises, including depression, grief, severe anxiety, guilt, and feelings of lack of control, which further deteriorate their well-being (14-15). Recognizing and understanding factors that can mitigate the risk of domestic violence in this vulnerable group is essential for effective intervention.

Extensive research suggests that certain psychological assets, such as self-esteem, self-efficacy, assertiveness, and perceived social support, play protective roles against domestic violence. Higher levels of self-efficacy enable women to better cope with negative emotions like anger and frustration (16-20), while low self-esteem has been linked to increased vulnerability to violence and a tendency to remain in abusive relationships (21-22).

Assertiveness, especially in terms of expressing sexual needs and defending rights, enhances women's capacity to confront and resist violence (17-18). Additionally, perceived social support acts as an empowering resource, offering women the resilience needed to prevent or escape violence (17, 19, 23). While these findings are well-established in general populations, there is a notable scarcity of research specifically focusing on infertile women. Given the unique psychological stressors and societal pressures faced by this subgroup, such as feelings of inadequacy and heightened emotional distress, it's crucial to examine whether these psychological factors can predict the risk of domestic violence among infertile women. Understanding these relationships can facilitate the development of targeted prevention and empowerment programs aimed at reducing violence and improving mental health outcomes for this vulnerable group.

Therefore, this study aims to explore the predictive role of cognitive self-assessment, sexual assertiveness, and perceived social support in domestic violence among infertile women, to inform more effective interventions tailored to their specific needs.

Materials and Methods

This was an applied predictive correlational study aimed at predicting domestic violence among primary infertile women based on psychological variables, including cognitive self-assessment, sexual assertiveness, and perceived social support. The data collection process spanned six months, from September 2022 to February 2023, due to the dispersion of the target population.

The study was conducted in two selected infertility clinics under the auspices of the Infertility Research Center of Urmia University of Medical Sciences, located in Urmia city. Before data collection, comprehensive permissions were obtained from the relevant institutional authorities and ethics committees to ensure compliance with ethical standards. These centers, selected for their specialization in infertility care and easy access to the target population, facilitated the identification and recruitment of eligible participants. Their collaboration ensured the study's feasibility and adherence to protocols, providing a suitable environment for collecting reliable data while maintaining confidentiality and respecting participants' rights.

The statistical population consisted of all primary infertile women attending these centers, diagnosed with infertility (failure to become pregnant after at least 12 months of unprotected intercourse), aged 18–49 years, married, and literate.

Exclusion criteria included unwillingness to participate, presence of psychiatric disorders, or any medical condition that could interfere with the study variables (24-27).

The sample size was calculated using Cochran's formula with a 95% confidence interval, an estimated standard deviation of 0.4 for domestic violence from prior research (3), and a 5% error margin. The initial sample comprised 245 individuals, but taking into account the possibility of a 5% dropout, the number of samples was estimated as 260 individuals. Participants were recruited from two infertility centers (Infertility Clinic 1, with 158 women with primary infertility, and Infertility Clinic 2, with 102 women with primary infertility). After allocation, some participants dropped out of the study, with 8 women from Clinic 1 and 4 women from Clinic 2 unable or unwilling to continue participating. Ultimately, the total number of women with primary infertility included in the study was 248, from whom data were analyzed.

d = 5% error Z = 1.96

$$n = \frac{\left(Z^2_{\frac{\alpha}{2}} \times S^2\right)}{d^2}$$

Eligible participants were selected via convenience sampling. The researcher (MM) personally visited each clinic and first explained the purpose and procedures of the study to the staff and management. The women were provided with detailed information about the study and its objectives, and written informed consent was obtained directly from those willing to participate. After that, the relevant medical records, containing demographic information and infertility history, were reviewed by the researcher to identify eligible participants. Subsequently, these women were contacted to reconfirm their willingness, and appointments were scheduled for data collection at the centers.

Several standardized questionnaires were used, as follows. Demographic Data was collected through a structured questionnaire at the beginning of the survey, covering age, education, socioeconomic status, etc. Domestic Violence was assessed using Alipour et al.'s (2019) Spousal Abuse Experience Questionnaire (28), comprising 19 items across five domains: emotional, verbal, sexual, mild physical, and severe physical violence. This questionnaire's responses are scored on a 5-point Likert scale (very low to very high). The total score ranges from 19 to 95, with higher scores indicating more severe abuse. The scale exhibited high internal consistency, with a Cronbach's alpha of 0.88 in this study (reliability previously reported as 0.86 in Alipour et al.'s (2019)). Self-efficacy was measured via Scherer et al.'s (1982) General Self-Efficacy Scale (29), containing 17 items rated on a 5-point scale, scored from completely disagree to completely agree. The total score ranges from 17 to 85, with higher scores indicating greater self-efficacy. In this study, Cronbach's alpha was 0.87. Self-esteem was assessed with Rosenberg's Self-esteem Scale (30), comprising 10 items scored from 4-point Likert responses. Scores range from 10 to 40, with higher scores indicating higher self-esteem. Its internal consistency was 0.86 in this study. Sexual Assertiveness was assessed using the Sexual Assertiveness Scale (SAS), also known as the Sexual Assertiveness Index, developed by

Morokoff et al. (1997) (31). The index consists of 12 items, six of which are related to refusing unwanted sexual advances and six to using condoms to prevent pregnancy and protect against sexually transmitted diseases during sexual intercourse. Participants respond to each item using a five-point Likert scale, ranging from "never" (1) to "always" (5). Scores range from 12 to 60, with higher scores indicating greater sexual assertiveness. The internal consistency of this index was shown to be satisfactory, with Cronbach's alpha coefficients of 0.85 in this study. Finally, perceived social support was measured with Zimet et al.'s (1988) Multidimensional Perceived Social Support Scale (MSPSS), which includes 12 items assessing support from significant others, family, and friends (32). The questions are answered based on a seven-point Likert scale, ranging from strongly disagree to strongly agree, yielding a score range from 12 to 84. Perceived social support is categorized based on the score achieved as low (score of 12 to 48), moderate (score of 49 to 68), and high (score of 69 to 84). In this study, Cronbach's alpha and intraclass correlation coefficients for this questionnaire were 0.89 and 0.88, respectively.

Participants completed questionnaires anonymously to ensure confidentiality, with no identifying information recorded. Data collection was carried out in a private setting at each center. Participants responded based on their honest thoughts and feelings without concern for judgment. The researcher facilitated the process by providing instructions and clarifying questions as needed.

Data analysis was performed using SPSS version 22. Descriptive statistics, such as mean and standard deviation, were used to measure research variables. The normality of the data was verified through the utilization of the Kolmogorov-Smirnov test, and the suitability of the model was confirmed through the examination of the independence of the observations (i.e., the independence of residual values or errors) from each other through the utilization of Durbin-Watson's statistic. The value of this statistic is always between 0 and 4. If there is no consecutive correlation between the residuals, the value of this statistic should be close to 2. A value less than 2 indicates a positive consecutive correlation, and a value greater than 2 indicates a negative one. Relationships between variables were examined using Pearson's correlation coefficient and multivariate regression analysis. A p-value of 0.05 or less was considered statistically significant.

Results

A total of 260 infertile women from Urmia City participated in this study. After excluding 12 incomplete questionnaires, data analysis was conducted on the remaining 248 questionnaires. The mean age of the women was 34.63±5.12 years, while the mean age of their husbands was 39.22±5.53 years. Table 1 shows the demographic characteristics of the study participants.

The mean and standard deviation values for the research variables (violence against infertile women, self-efficacy, self-esteem, sexual assertiveness, perceived social support) are presented in Table 2.

Table 2 shows the prevalence of different forms of spousal abuse in infertile women, with emotional violence being the most common and severe, and physical violence being the least frequent. The average score on the spouse abuse questionnaire for infertile women was 36.06 ± 10.51. Higher average scores in each dimension of violence indicate a greater likelihood of spouse abuse among infertile women. Also, the average score of the perceived social support variable ranges from 6.46 to 8.89, respectively, in the "social support perceived by friends" and "social support perceived by family" dimensions.

The K-S test was used to evaluate the normality of the quantitative data distribution. The results of the K-S test showed that the data were normally distributed, with the significance level for p-value set at $P<0.05$.

Table 1. Demographic characteristics of study participants (N = 248)

Categories	Frequency (%)
Women's age (mean ± SD)	
34.63 ± 5.12	248 (100)
Age (years)	
18-24 years	65 (26.20)
25-34 years	103 (41.53)
35-49 years	80 (32.25)
Husbands' age (mean ± SD)	

Categories	Frequency (%)
39.22 ± 5.53	248 (100)
Age (years)	
20-29 years	81 (32.66)
30-39 years	78 (31.45)
40 years ≤	89 (35.88)
Women's age at marriage	
20.47 ± 3.56 years	248 (100)
Age (years)	
≥18 years	36 (14.51)
19-24 years	114 (45.96)
25 years ≤	98 (39.51)
Average duration of marriage	
8.21 ± 4.41	248 (100)
1-5	41 (16.53)
6-10	98 (39.51)
years 10 <	109 (43.95)
Women's education level	
Diploma degree or below	97 (39.11)
Bachelor degree	35 (14.11)
Master's degree or above	116 (46.77)
Husbands' education level	
Diploma degree or below	93 (37.50)
Bachelor degree	22 (62.78)
Master's degree or above	133 (8.87)
Women's employment status	
House wife	173 (69.8)
Employed	75 (30.2)
Husbands' employment status	
Self-employed	130 (52.5)
Employee	118 (47.5)
Place of residence	
Urban	171 (68.84)
Rural	77 (31.16)
Economic status	
Poor	63 (25.26)
average	120 (48.56)
good	65 (26.18)

Table 2. The mean and standard deviation of the violence against infertile women, self-efficacy, self-esteem, sexual-assertiveness, perceived social support

Variable	Mean±SD	Range of scores
Light physical violence	8.13 (4.21)	5-25
Severe physical violence	5.41 (3.02)	4-20
Emotional violence	12.22 (6.81)	4-20
Verbal violence	7.36 (5.71)	3-15
Sexual violence	5.78 (3.11)	3-15
Total violence against infertile women	36.06 (10.51)	19-95
Self-efficacy	30.14 (9.65)	17-85
Self-esteem	22.36 (5.93)	10-40
Sexual-assertiveness	25.12 (7.67)	12-60
Family support	8.89 (2.94)	4-28
Friends' support	6.46 (2.56)	4-28
Important others support	7.19 (2.78)	4-28
Total perceived social support	26.78 (8.23)	12-64

Furthermore, the Skewness and Kurtosis values were within the range of 2 to -2, which indicates normality of research variables. Therefore, to address the research question, first, the Pearson's correlation coefficient was used to examine the relationship between the predictor and criterion variables (Table 3), which revealed a significant negative relationship between domestic violence against infertile women and predictor variables of self-efficacy, self-esteem, sexual assertiveness, perceived social support, and its components ($P<0.05$). Given the significant relationship between the research variables, multivariate regression was employed to predict violence against infertile women based on the predictor variables. The results of the multivariate regression analysis can be found in Table 4.

Table 3. Correlation coefficients between predictor and criterion variables and their subscales

Predictor variables	Criteria variables

	Light physical violence	Severe physical violence	Emotional violence	Verbal violence	Sexual violence	Total violence against infertile women
Self-efficacy	-0.691**	-0.511**	-0.450**	-0.258**	-0.615**	-0.635**
Self-esteem	-0.254**	-0.352**	-0.305**	-0.317**	-0.452**	-0.490**
Sexual-assertiveness	-0.428**	-0.268*	-0.276**	-0.423**	-0.471**	-0.536**
Family support	-0.437**	-0.610**	-0.332**	-0.325**	-0.241**	-0.473**
Friends' support	-0.127*	-0.125*	-0.241**	-0.138*	-0.218**	-0.221*
Important others support	-0.140*	-0.186*	-0.213**	-0.209*	-0.149*	-0.280*
Total perceived social support	-0.377**	-0.308**	-0.391**	-0.284*	-0.440**	-0.363**

Note: ** P< 0.01 level * P< 0.05 level Sample size=248

According to the results of the regression analysis. The correlation between the predictor and criterion variables is equal to 0.786, and the adjusted R-squared shows 0.607, which means that the predictor components can predict almost 60% of domestic violence changes in infertile women.

The analysis of the variance test indicates the significance of the regression model for predicting domestic violence scores in infertile women based on predictor variables.

Table 4. Summary of the regression analysis model for predicting violence against infertile women based on predictor variables

Model	R	R^2	Adjusted R^2	F	P-Value
1	0.786	0.618	0.607	58.118	**0.001**

The obtained F value of 58.118 indicates that the regression model for predicting domestic violence against infertile women has predictive components of self-efficacy, self-esteem, sexual assertiveness, and perceived social support (P<0.001). Therefore, it can be said that the score of domestic violence against infertile women can be predicted linearly through the scores of the above predictive variables.

According to the beta value obtained for each of the variables in the regression coefficients, it is possible to determine the impact of each variable in reducing or increasing domestic violence against infertile women. Most predictor variables, except of support from friends and support from others, significantly predict the variance in domestic violence against infertile women (P<0.05). Specifically, a one-unit increase in self-esteem score was associated with a 0.623 decrease in the average score of domestic violence against infertile women (P<0.001). Additionally, self-efficacy (B=-0.171, P=0.012), sexual assertiveness (B=-0.150, P=0.004), and family support (B=-0.169, P=0.006) were inversely related to domestic violence against infertile women. For every one-unit change in self-efficacy, sexual assertiveness, and family support scores, the average score of domestic violence against infertile women decreased by 0.171, 0.150, and 0.169, respectively. The assumption of independent errors was assessed using Durbin-Watson's index, which yielded a value between 1.5 and 2.5, indicating independence of errors.

Research indicates that psychological variables play an essential role in women's exposure to violence (33-34). This study examined whether cognitive self-evaluation, sexual assertiveness, and social support predict domestic violence among infertile women. Findings indicated these factors accurately predict about 60% of the likelihood of experiencing violence, highlighting their significant role.

Table 5. Regression coefficients of research variables

Model	Unstandardized	Standardized	Durbin-

	Coefficients		Coefficients			Watson
	B	SE	β	t	P-Value	
Constant	1.137	0.212		5.372	0.001	
Self-efficacy	-0.228	0.090	-0.171	2.524	0.012	
Self-esteem	-0.758	0.077	-0.623	9.874	0.001	
Sexual-assertiveness	-0.169	0.058	-0.150	2.924	0.004	1.943
Family support	-0.228	0.128	-0.169	1.774	0.044	
Friends' support	0.026	0.095	0.020	0.273	0.385	
Important others support	0.053	0.059	0.047	0.908	0.265	
Total perceived social support	-0.237	0.085	-0.167	1.778	0.006	

Among the predictive variables, self-esteem demonstrated the most significant impact in reducing violence against infertile women. This finding aligns with previous research emphasizing the adverse effects of low self-esteem on vulnerability to abusive behavior (17, 35). Studies by Adebanjo (2024) and Nikrouy et al. (2024) underscore that diminished self-worth impairs women's ability to assert boundaries, rendering them more susceptible to violence and control in intimate relationships (36, 37).The impact of infertility on self-esteem is extensively documented; the inability to conceive often leads to feelings of inadequacy, shame, and social stigma, which erode an individual's self-efficacy and self-worth. Such emotional distress has been shown to elevate the risk of experiencing domestic violence, as vulnerable women may be less likely to recognize or resist abusive behaviors (38). Contemporary research by Kordi et al. (2023) further confirms that infertility-related depression and anxiety exacerbate feelings of helplessness, increasing the likelihood of tolerating or accepting abuse to maintain relational stability (39). Evidence also indicates that low self-esteem correlates with higher incidences of gender-based violence, with psychosocial studies demonstrating that women with diminished self-regard are more prone to stay in harmful environments, perceiving themselves as undeserving of better treatment (40-41). This issue can threaten the mental and social health of infertile women because, in addition to facing social stigma, these women have a greater tendency to self-stigma, which is one of the destabilizing factors of individual identity and affects their self-efficacy and self-esteem (42-43). These findings underscore that fortifying self-esteem could serve as a critical intervention in preventing domestic violence, especially among vulnerable populations such as infertile women facing compounded psychological stressors.

This study found that self-efficacy and sexual assertiveness are significant predictors of violence against infertile women. These findings align with previous research that has also identified self-efficacy and sexual assertiveness as essential factors in predicting violence against infertile women (44-45). Women with higher self-efficacy and sexual assertiveness are better at setting boundaries, resisting abuse, and seeking help, which reduces depression, anxiety, and stress during violence (46-47). Higher self-efficacy leads to more effective coping and prevention, suggesting that increased assertiveness can lower the risk of domestic violence for infertile women (48-49).

Another predictor factor examined in this study was perceived social support from family, friends, and significant others. Access to this support helps individuals better manage stress (50). The study findings indicate that family support is an important predictor of reduced domestic violence among infertile women, aligning with prior research emphasizing the protective role of family support against violence (51-52). Family members' awareness of infertile women's challenges allows them to provide emotional and practical help, enhancing feelings of belonging and security, which are especially valued in this group. However, some recent studies suggest that the impact of social support can be complex; for example, Beaulaurier et al. (2008) found that in certain contexts, high levels of family support may also reinforce controlling behaviors or reinforce social expectations that contribute to stress, potentially increasing vulnerability to violence (53). Similarly, research

indicates that support from important others and friends may sometimes be less protective or even associated with higher stress levels, depending on the quality and context of that support, highlighting that not all social support is uniformly beneficial (54). These conflicting findings underscore the importance of examining the nature and context of social support when assessing its influence on domestic violence risks.

The issue of domestic violence is multifaceted and influenced by numerous variables. A few variables were examined in this study, including self-efficacy, self-esteem, sexual assertiveness, and perceived social support. Other factors that may influence domestic violence, such as culture, ethnicity, and other psychosocial factors, were not examined. Therefore, it is suggested that in the future, researchers should examine a broader range of variables affecting domestic violence to provide a more comprehensive understanding of this phenomenon. Another limitation was that the study design was cross-sectional, which limits the ability to establish causal relationships between variables. Therefore, to obtain more substantial evidence for predicting domestic violence and understanding its dynamics, longitudinal studies are recommended. However, this study provides valuable insights into the role of psychological factors that can help predict domestic violence against infertile women and expands knowledge in this field. The study focusing specifically on infertile women can give us a better grasp of the factors that contribute to domestic violence in this particular group and highlight the challenges and obstacles that infertile women may encounter in their lives. Furthermore, the results of this study have practical implications for interventions and support services for infertile women who are experiencing domestic violence.

Conclusion

Understanding the factors that contribute to the prevention of domestic violence against infertile women is essential in improving women's health and well-being worldwide. The results obtained from this study emphasize the importance of addressing cognitive self-assessment, sexual assertiveness, and perceived social support variables in interventions and support programs for infertile women to prevent and manage domestic violence in this population. By understanding the role of the mentioned variables, practitioners can make targeted interventions to improve women's coping mechanisms and empower them in difficult situations. Additionally, recognizing the importance of social support in preventing domestic violence can inform the development of support networks and resources for infertile women, providing them with the necessary assistance and guidance. The findings of the study can also serve as a basis for raising awareness among healthcare professionals and policymakers about the specific vulnerabilities faced by infertile women, leading to the implementation of policies and guidelines that address their unique needs and protect them from domestic violence.

Declerations

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Conflicts of interest

The authors declared no conflicts of interest.

Ethical considerations

All procedures adhered to ethical standards outlined in the Helsinki Declaration (2000 revision) and were approved by the institutional ethics committee. Written informed consent was obtained from all participants after providing them with comprehensive information about the study objectives. The study ensured confidentiality and voluntary participation, with all questionnaires completed anonymously.

Code of Ethics

This research is derived from the research project approved by the research committee of Shahid Beheshti University of Medical Sciences with the code IR.SBMU.PHNS.REC.1398.079.

Use of Artificial Intelligence (AI)

To ensure the integrity of the presented scientific work, we used the artificial intelligence tools Chat GPT Sidebar & GPT-4 Vision, Version 5.3.0, Grammarly Version

14.1218.0, and Quill Bot Version 4.4.10 to translate, edit, and paraphrase the article. We have made every effort to express original ideas and correctly cite all referenced sources. We welcome any feedback on the novelty and originality of the ideas discussed in this manuscript.

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Authors' contribution

All authors contributed to the study design. MM and AR prepared the first draft of the manuscript. All authors contributed significantly to the critical revision of drafts, the improvement of methodology and content, and advised on the design and revision of the study manuscript. All authors read the final manuscript and issued final approval for publication of the manuscript.

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