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DISCOVERY
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Predicting suicidal ideation based on meaning in life: Investigating the mediating roles of interpersonal needs and depression in patients with Multiple Sclerosis (MS)

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ABSTRACT

Introduction: MS patients are very likely to commit suicide due to their medical condition. For this reason, the present study was performed to predict suicide commitment based on meaning in life and with the mediating roles of depression and interpersonal needs in patients with MS. *Methods:* The present study was a cross-sectional study including all MS patients in Tehran. Subjects (n=206) were selected using the convenience sampling method. They completed questionnaires about meaning in life, Beck's depression, Beck's suicidal ideation, and interpersonal needs. Data were analyzed using SPSS-25 and AMOS software. The path analysis method was used to analyze the data. *Results*: Results of the path analysis showed that, in patients with MS, meaning in life can predict suicide commitment through the help of mediators, including depression and interpersonal needs (thwarted belongingness and perceived burdensomeness) death in MS patients. Fit indices showed that the model has been confirmed. *Conclusion*: Meaning in life, depression, and interpersonal needs play pivotal roles in predicting suicidal behavior in patients with MS; for this reason, these components must be addressed as therapeutic goals.

Keywords: Suicide, Multiple sclerosis, Thwarted belongingness, Perceived burdensomeness, Depression

1. INTRODUCTION

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system that mainly affects young people (Bol et al., 2010). This condition is about three times higher in women than men and primarily affects the 15 to

50 age group (Brunner, 2010). Because of the unpleasant physical conditions it causes, this disease has been linked to various mental problems, including depression and other mental disorders (Bogosian et al., 2015). The presence of physical and mental problems in these patients results in a poor quality of life, which, if left untreated, can lead to suicide in many of these patients. Approximately 15% of these patients die by suicide, and about 25% have severe suicidal ideation, which, if ignored, can lead to suicide commitment (Feinstein and Pavisian, 2017). Also, another problem that MS patients face is the high level of depression. Previous research has shown that more than half of MS patients have depression-related problems (Feinstein et al., 2014). As previous studies showed that depression is one of the critical risk factors for suicide, depression in these patients is associated with illness severity and the possibility of suicide (Orsolini et al., 2020). Accordingly, paying attention to these patients' suicidality and depression-related factors is significant.

One of the theories whose research findings focus on contributing factors in shaping suicidal behavior is the interpersonal theory of suicide. This theory considers suicide to be the product of two main factors: thwarted belongingness and perceived burdensomeness (Van-Orden et al., 2010). This means that the more a person feels like a burden to others and feels alienated from those around them, the more likely they are to commit suicide. The physical condition caused by MS makes patients helpless, and they may need help from others to cope with the disease, so they feel like a burden. Findings from a variety of studies have shown that both thwarted belongingness and perceived burdensomeness are related to suicidal ideation in patients with chronic diseases Campos et al., (2018), cancer Schomberg et al., (2021), and student populations (Kiani et al., 2019).

Finding meaning in life is another critical factor that plays a significant role in managing acute diseases. The search for meaning in life is an essential protective factor when individuals face emotional distress and existential crises, especially those with chronic severe illnesses (Kleiman and Beaver, 2013). Because having purpose in life is associated with less distressing experiences, better adaptability to conditions, and a lower risk of suicide, many psychologists believe that patients with serious diseases should use meaning-centered therapies, supported by research findings (Ghasemi et al., 2022). A study by Heisel et al., (2020) showed that meaning-centered treatment is essential in reducing suicidal ideation in MS patients. In another study by Ghasemi et al., (2022), findings showed that meaning-based therapy was significantly associated with significantly reducing depression in patients with MS.

On the other hand, previous research findings suggest a relationship between the search for meaning in life and the feeling of being a burden and perceived burdensomeness; disorganized purpose in life is associated with thwarted belongingness and perceived burdensomeness (Beach et al., 2021). Despite inconsistent research findings regarding the role of thwarted belongingness and perceived burdensomeness in suicide, no studies have been performed in this area for patients with MS. In addition, as the researchers of this study investigated, no studies have been conducted to predict death anxiety and depression based on the meaning of life and the mediating roles of thwarted belongingness and perceived burdensomeness. Therefore, the present study was performed to predict death anxiety and depression based on the meaning of life and the mediating roles of interpersonal needs (thwarted belongingness and perceived burdensomeness) in patients with MS.

2. METHODS AND MATERIALS

Procedure

The present study was conducted in 2023 and as a path analysis design. The population included all MS patients in Tehran, of which 208 were selected. Two patients were excluded from the analysis due to incomplete questionnaires. First, after receiving the code of ethics from Shahid Beheshti University of Medical Sciences (IR.SBMU.MSP.REC.1400.432), patients were selected from hospitals in Tehran. Advertisements were distributed in various medical centers asking patients with this condition to participate in this study. The inclusion criteria for the study were as follows: Diagnosis of MS, not having mental disorders such as schizophrenia, bipolar spectrum disorder, and substance abuse, consent to participate in the research, and not having other serious chronic diseases. Complying with ethical issues, we kept all personal information of the participants confidential. Also, they filled out an informed consent form before completing the questionnaires. Data were analyzed using SPSS-25 and AMOS.

Beck Scale for Suicidal Ideations (BSSI)

This tool was developed in 1979 by Beck et al., (1987) It contains 19 items and three response options: "none," "a little," and "a lot". In total, the scale scores range from 0 to 38. Its reliability is 0.83, and its convergent validity is 0.76. This questionnaire has been normalized in Iran, and its Cronbach's alpha is 0.95. Its reliability has been calculated using the split-half test and is 0.75 (Anisi et al., 2005).

Interpersonal Needs Questionnaire (INQ)

This questionnaire has multiple versions (10, 12, 15, 18, and 25 questions). As reported by the 10 and 15 versions have the best validity and fit for the exploratory factor analysis model (Van-Orden et al., 2012). Therefore, the 15-item version with a seven-point Likert scale was used. It includes 15 items asking participants to choose the best possible answer based on their beliefs about the extent to which they are currently connected to other people and consider themselves a burden to others (perceiving themselves as a burden). The purpose of this questionnaire is that participants can show researchers the extent to which interpersonal behaviors and the value of those behaviors can predict their suicidal behaviors, for example. In addition, a higher score on this scale means higher levels of thwarted belongingness and perceived burdensomeness, indicating the person's belief that they are the source of problems for others. The idea about thwarted belongingness and perceived burdensomeness is caused by environmental factors a person has to face in their lifetime. Also, good internal validity (alpha = 90%) and good reliability have been reported for this scale (Kiani et al., 2019).

Beck's Depression Scale (BDI)

This scale is widely used as a self-report tool to measure depression-related cognition. It consists of 21 items, each scored from 0 to 3 (Beck et al., 1987). BDI internal consistency is 0.93, and Cronbach's alpha coefficient is 0.81. This questionnaire has been standardized in Iran, and its reliability was calculated using the test-retest method and is 0.96. The Cronbach's alpha coefficient is 0.91 (Hamidi et al., 2015).

The Meaning in Life Questionnaire (MLQ)

This questionnaire was designed by (Steger et al., 2006). MLQ consists of 10 items and is scored on a 5-point Likert scale, ranging from entirely true to completely false. Its internal validity is 0.86 (Steger et al., 2006). This questionnaire was standardized in Iran by Mesrabadi et al., (2013). Its internal fact is 0.63 (Mesrabadi et al., 2013).

3. RESULTS

The study sample included 206 patients with MS, with a mean age of 48.03 years (83.5% female). In terms of educational status, 63 (30%) had a university degree, 124 had a bachelor's degree (60%), 15 (7%) had a master's degree and 5 (2%) had a doctorate. Table 1 shows the demographic characteristics of the research samples. Table 2 reports the studied variables' mean, correlation, skewness, and kurtosis. The Compared gender groups had a similar percentage of reported participants (Figure 1).

Table 1 Comparison of demographic characteristics of research samples

Variables	Subgroups	Frequency	Percent%
Sex	Women	173	83.98%
	Men	33	16.01%
Marital status	Single	87	42.23%
	Married	109	52.91%
	Divorced	10	4.85%
Education	Diploma	63	30.58%
	Bachelor's degree	123	59.70%
	Master's degree	15	7.28%
	Ph.D.'s	5	2.42%

As shown in Table 2, there are significant correlations between the variables. In addition, as the results show, the skewness and kurtosis of the research variables range from -2 to -2, so the data is standard. Figure 2 shows the mean self-report score for both males and females.

Table 2 Correlation matrix of study variables

Variable	1	2	3	4	5	Mean	Skewness	Kurtosis
Suicide	1					6/64	-0/23	-1/30
Depression	0/43 **	1				19/02	-0/01	-1/39
Perceived burdensomeness	0/47**	0/43**	1			17/00	-0/43	-0/90
Thwarted belongingness	0/49**	0/45**	0/54**	1		21/30	-0/20	-1/44
Meaning in Life	-0/23 **	-0/41 **	-0/43*	-0/44**	1	24/96	-0/71	-0/96

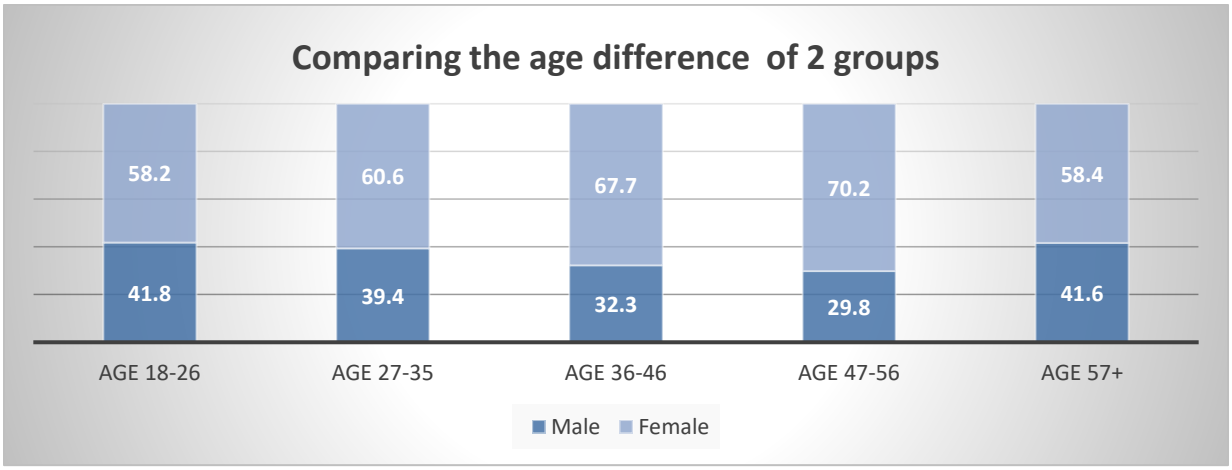

Figure 1 A clustered bar chart comparing the age percentage of the gender groups

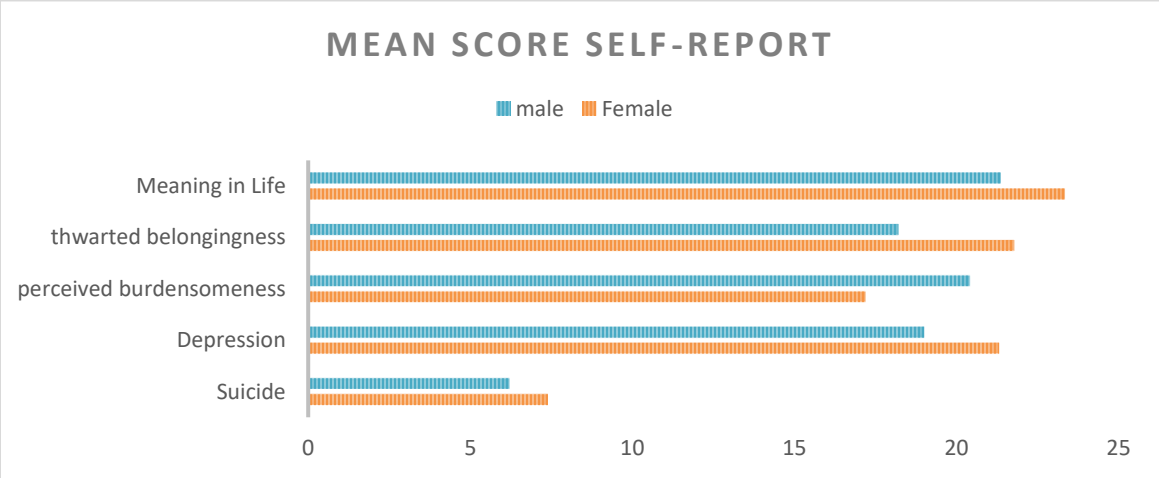

Figure 2 Mean participant self-report scores by gender group

After analyzing the descriptive data, path analysis is used to analyze the descriptive results. Before interpreting the path analysis results, the path analysis assumptions were verified and approved. The variables' multicollinearity is studied using the tolerance statistics and the coefficient of variance inflation factor, and the results show no multicollinearity between the variables. Accordingly, path analysis was used to investigate the relationship between variables, including meaning in life, thwarted belongingness, perceived burdensomeness, and suicide. Figure 3 plots the results of the path analysis, and Table 3 shows the final model fit indices in the sample.

Table 3 shows the fit indices of the final model, including the comparative appropriate index (CFI = 0.99), the chi-square index/ the degree of freedom (CMIN/DF = 2.74), the goodness of fit index (0.92 = GFI), incremental appropriate index (IFI = 0.99), comparative appropriate index (CFI = 0.99) and root mean square error of approximation (RMSEA = 0.09). All indicate the optimal fit of the final model. Therefore, the model in Figure 3 represents a good fit.

Table 3 Fit indices of the final model

Global model fit index	CMIN/DF	RMSEA	GFI	IFI	CFI	TLI
Acceptable criterion	< 3	<.1	>90	>90	>90	>90
Obtained value	2/74	0/09	0/92	0/99	0/99	0/94

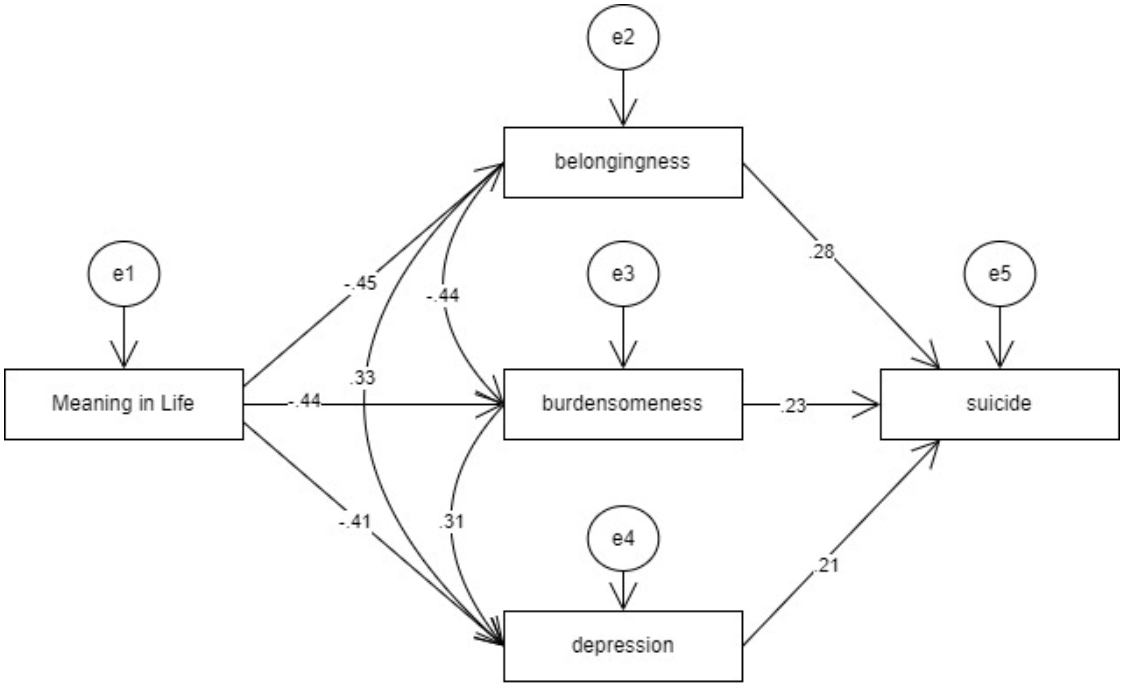

Figure 3 The output model of the mediators in the relationship between meaning in life and suicide

In addition, the results of the direct standard coefficient are presented in the table below. As the results show, the degree of direct impact of the variables ranges from 0.08 to -0.23. Other direct relationships have also been reported. On the other hand, the indirect relationship between meaning in life and suicide with the mediating roles of perceived burdensomeness, thwarted belongingness, and depression was -0.31, which is statistically significant. It is shown in (Table 4).

Table 4 Results of indirect relationships in the final model

Path	Std value	*P*-value
Meaning in Life → perceived burdensomeness* thwarted belongingness* Depression → suicide	-0/31	0/001

4. DISCUSSION

The present study investigated the role of meaning in life in predicting suicidal behavior with the mediating part of interpersonal needs and depression in patients with MS. The results of this study suggest that meaning in life, with the mediating role of interpersonal needs, can predict suicidal behavior in patients with MS. This finding is consistent with previous studies that have shown a relationship between meaning in life and interpersonal needs in predicting suicidal behavior (Kleiman and Beaver, 2013; Beach et al., 2021). To explain this result, it can be said that due to the disease and its painful condition, the patients' communication quality changes, and they see themselves as a problem for the family; this is one of the leading causes of suicide (Wong et al., 2022). Indeed, due to physical discomfort and impaired functioning, patients feel helpless; for this reason, interventions aimed at meaning in life improve their sense of well-being, and, as a result, suicidal thoughts will be modified by reducing perceived burdensomeness (Khazem et al., 2017).

In addition, at the onset of the disease, the patient's interpersonal relationships are often affected, so they establish fewer interpersonal relationships with others than before (Herbert et al., 2019). Their communication becomes less significant when they need to communicate with people without illness. For this reason, they feel lonely and may consider suicide to end this loneliness

(Heisel et al., 2020). The connection between viewed burdensomeness and thwarted belongingness with suicidal thoughts is influenced by meaning in life, which has been confirmed by many studies (Espinosa-Salido et al., 2021). The result of this study confirmed the interpersonal suicide theory, which considers suicide to be the result of a defect in interpersonal relationships. This condition is rooted in illness and irrational feelings, as patients think life is meaningless and their existence is a burden on the shoulders of others (Rodríguez-Prat et al., 2019). Another finding of this research was that meaning in life can predict suicide in MS patients through depression. This finding is consistent with previous research showing the role of depression and purpose in life in suicidal ideation (Furr et al., 2001; Dumesnil and Verger, 2009).

Depression itself affects the way the meaning of life leads to suicide. People with no appropriate intention in life experience higher levels of depression and mental distress (Kleftaras and Psarra, 2012). Depression, however, is associated with incredible frustration and discomfort that the person no longer wants to live (Richards, 2011). As a result, they think of suicide because of anhedonia and unhappiness. In addition, depression has been linked to sleep problems to the extent that even some depressed people complain of sleep problems. Sleep problems are one of the main risk factors for suicide. Study results show that the risk of suicide in people with sleep problems is higher than in those without sleep problems (Bernert and Joiner, 2007). Previous studies have shown that depression is associated with increased health costs and healthcare visits Simon et al., (1995), as it can lead to increased rumination about the disease, its problems, and its costs. The person ignores other aspects of life and focuses on the condition, which can increase the possibility of suicide (Druss and Pincus, 2000).

5. CONCLUSION

Overall, it can be concluded that having meaning in life can improve patients' quality of life. This also applies to patients with MS. When patients find meaning in their lives; they will be able to accept the condition caused by their disease and gain more information about their condition to manage it better. As a result, they will be much more active and feel better in control of their disease. Also, being meaningful improves interpersonal relationships; one person will not see their condition as a big problem or burden on others. This will change the perspective on burdensomeness and enhance the quality of one's relationships. Among the protective factors against suicide is having interpersonal support and communication with others. Loneliness and keeping a distance from others due to the illness can lead to rumination, depression, and suicidal thoughts.

More interaction with others can modify their cognitions. With the help of meaning in life, a person will find a better, healthier lifestyle that is more suitable for their physical condition and prevents mental distress. Despite the above study findings, the present study has some limitations that must be considered when generalizing the findings. First, the current research method is cross-sectional. The study sample included only patients with MS. The results of this study are not generalizable to people without MS, the general population, and those with a history of suicide. It is therefore suggested that future research be longitudinal and conducted in other patients with a history of suicide.

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Author Contributions

Mehdi Bazi Alahri (Data collection and writing), Amir Sam Kianimoghadam (Analysis), Maryam Khesali (Data collection), Abbas Masjedi-Arani (writing), Nassim Zekibakhsh Mohammadi (Data collection).

Ethical approval

The Medical Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran (Ethical approval code: IR.SBMU.MSP.REC.1400.432) approved the study protocol.

Informed consent

Before the start of the study, informed written Oral informed consent was obtained from all participants included in the study.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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