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The Mediator Role of Mental Health Literacy in the Relationship Between Demographic Variables and Health-Promoting Behaviours

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Abstract

Background: An understanding of the relationships between mental health literacy and health promotion behaviours is essential for the development of community-based interventions in the prevention of mental disorder.
Objectives: The aim of this study was to examine the relationships between mental health literacy and health-promoting behaviours and to assess the contributions of mental health literacy through mediation to demographic characteristic in health-promoting behaviours.
Methods: This cross-sectional study was performed on 378 participants by convenience method in public places of Bushehr city from January to March 2016. The data collection tool included demographic variables section, mental health literacy scale, and health-promoting lifestyle profile. Assessment of the potential mediation effect of MHL was assessed using the three criteria. The association of the demographic characteristic with the MHL must be significant, the association of the demographic characteristic with health-promoting behaviours must be significant, and MHL must be significantly associated with the health-promoting behaviours controlling the demographic characteristics. The analysis was done by SPSS software version 20.0.
Results: Findings indicated that there is a significant association between the education level ($P < 0.001$) and history of mental disorder ($P = 0.004$) with MHL score. There is a significant association between education ($P < 0.001$), employment status ($P = 0.028$), marital status ($P = 0.013$), and history of mental disorder ($P = 0.035$) with HPLP score. The hierarchical multiple regression analysis indicated that the education tended to have both direct and indirect effect in HPLP.
Conclusions: MHL is a significant predictor and mediator to all the health-promoting behaviours. MHL is predictor of health-related behaviours, and, it also mediates the effect of the academic education on these behaviours.

Keywords: Behaviour, Health Promotion, Literacy, Mediating, Mental Health

1. Background

Mental health is a central determinant of the quality of life (1). Approximately, one in every five people meets criteria for a mental disorder in their lifetime (2), therefore, mental health disorders account for a large part of the overall burden of disease (1).

In addition to mental health, health-promoting behaviours such have been identified as determinants of a healthy lifestyle. These behaviours have been shown to correlate with optimal health, and consequences of individual failure to engage in these behaviours are not only limited to physical disorders. Many of these consequences are psychological such as lowered self-esteem, increased levels of mental disorder, and an increased likelihood to engage in high-risk behaviours such as smoking and drinking alcohol (3). Therefore health-promoting behaviours can improve mental health. Despite the importance of these behaviours in improving mental health, little progress has been made over the last two decades to improve these behaviours (4-7). Therefore, identification of effective factors on health-promoting behaviours is essential for improving mental health.

The engagement of an individual in health-promoting behaviours is thought to be related to health literacy (8-10).

Health literacy may be a critical and modifiable factor for improving preventive care and reducing health disparities (e.g., cardiovascular disease, type 2 diabetes, cancer, and mental health disorders) (11).

'Health literacy' has been defined as the ability to gain access to, understand and use information in ways that

promote and maintain good health (12). By extension, researchers have coined the term 'mental health literacy' to refer to the knowledge and beliefs about mental disorders which aid their recognition, management or prevention (13).

Regarding the relationship between health literacy and health-promoting behaviours (14-17), it seems that mental health literacy, as one component of health literacy, is associated with health-promoting behaviours.

An empirical understanding of the nature of the relationships between mental health literacy and health-promoting behaviours is essential for the development of community-based interventions to improve mental health.

Considering the importance of mental health and the relationship between this aspect of health with health promotion behaviours and conducting numerous studies on the relationship between these behaviours and health literacy, it is necessary to study the relationship between health promotion behaviours and MHL as a new component of health literacy. Therefore, purpose of the current study was to examine the relationships between mental health literacy and health-promoting behaviours and to assess the contributions of mental health literacy through mediation to demographic characteristic in health-promoting behaviours. The specific.

2. Objectives

1- Examining whether demographic factors associate to MHL,

2- Examining whether demographic factors associate to health-promoting behaviours,

3- Examining whether MHL associate to health-promoting behaviours with controlling the demographic characteristics.

3. Materials and Methods

3.1. Sample

This cross-sectional study was performed on 400 adults aged 18 - 65 years (covering the highest age range with high accountability) in public places such as park, mosque, and shopping malls of Bushehr city, a south-western province in Iran. Data collection was carried out through convenience sampling procedure from January to March 2016. The sample size was estimated by formula:

$$n \geq \left[\frac{Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}}{\frac{1}{2} ln\left(\frac{1+r}{1-r}\right)} \right]^2 + 3 \quad (1)$$

by using the formula as which the Pearson's correlation; r is 0.21 (14), using a two sided test, 1% significance level test ($\alpha = 0.01$) with power 90% ($\beta = 0.1$), the required sample size is approximate 331 and with considering attrition rates (20%), about 400 subjects were required for this study.

The inclusion criteria were the age group of 18 - 65 years living in Bushehr for more than one year, lacking mental and/or physical disabilities, and having the ability to read and write according to the participant's report. For sampling by referring to public places, eligible persons were identified and after explaining the goals of the study, the subjects willing to participate in the study completed the questionnaire.

Out of total 400 participants, 22 participants submitted imperfect data questionnaires, and so they were excluded from the study. Finally, a total of 378 (87.9%) of the questionnaires were returned.

3.2. Instruments and Measures

A questionnaire with three sections was designed for this study. The first section was related to demographic variables including age, sex, marital status, the level of education, employment status, income status, and family/ personal history of mental disorders. The second section was on mental health literacy, assessed by O'Connor mental health literacy scale (18). The third section was on health-promoting behaviours as reflected in the health-promoting lifestyle profile II (HPLP-II) (19).

The standard "forward- backward" procedure was applied to translate the O'Connor MHL Scale and HPLP-II questionnaire from English into Persian. To establish content validity, we used the content validity ratio (CVR) to quantify the extent of experts' agreement, including six health education specialists, one psychologist, one health promotion specialist and one faculty member in nursing.

The MHL scale included a total of 35 items, which consisted of the ability to recognize disorders (8 items), knowledge of where to seek information (4 items), knowledge of risk factors and causes (2 items), knowledge of self-treatment (2 items), knowledge of the professional help available (3 items), and attitudes that promote the recognition or appropriate help-seeking behaviour (16 items). All the items related to the ability to recognize disorders, risk factors and causes, and professional help available had a 4-point Likert scale ranging from very unlikely (score = 1) to very likely (score = 4). The questions about knowledge of self-treatment had a 4-point Likert scale ranging from very unhelpful (score = 1) to very helpful (score = 4). The questions about knowledge of where to seek information and attitude that promote the recognition or appropriate help-seeking behaviour had a 5-point Likert scale ranging from strongly disagree (score = 1) to strongly agree (score

= 5). The scores of 11 items were reversed. The score of MHL ranged from 35 to 160, with higher scores implying an adequate MHL (18). In this study, the obtained Cronbach's alpha of total factors was 0.74, and the content validity ratio (CVR) was 0.90.

The HPLP-II included 52 questions, and all items are scored using a Likert scale ranging from 1 (never) to 4 (always). Therefore, the total questionnaire score ranges between 52 and 208. This standard questionnaire for measuring health-promoting behaviours includes six dimensions such as health responsibility (9 items), physical activity (8 items), nutrition (9 items), spiritual growth (9 items), interpersonal relations (9 items), and stress management (8 items). Higher scores indicate more favourable conditions in persons in terms of health-promoting behaviours. For this instrument, Cronbach's alpha of total factors was reported 0.94 (19, 20). In this study, we obtained the Cronbach's alpha of total 0.92, and CVR was 0.93.

3.3. Data Analysis

The data obtained from the total of 378 completed questionnaires were analysed by SPSS version 20. Descriptive statistics was used to examine the demographic characteristics, the level of MHL, and distribution of each of the health-promoting behaviours.

Assessment of the potential mediation effect of MHL was assessed using the criteria of Barron and Kenny (21). To satisfy the criteria for mediation following conditions must be met.

1- The association of the demographic characteristic with the MHL must be significant.

2- The association of the demographic characteristic with the health-promoting behaviours must be significant.

3- MHL must be significantly associated with the health-promoting behaviours controlling the demographic characteristics.

The association of demographic variables with MHL, and health-promoting behaviours were assessed by T-test and one-way ANOVA. Also, Pearson's correlation coefficient was calculated to assess the association between mental health literacy and health promotion behaviours and age.

For the third criterion, at first, eight multiple regression analysis was carried out to demonstrate the effective demographic variables for dependent variables (HPLP, MHL and six dimensions), then two-step hierarchical multiple regression analysis was used. In hierarchical multiple regression analysis, at first, the common effective demographic variables between MHL and each of the health-promoting behaviours were entered into the model and then MHL was added to the previous regression models to find out whether MHL was significantly associated with each of the health-promoting behaviours, and whether the β coefficients were reduced compared to the regression models without MHL. The significance level was assumed to be 0.05.

3.4. Ethical Principles

The participants were told that they could withdraw from the study at any time and that all information would be kept secret and anonymous. The required permissions for research were obtained from the vice chancellor of Bushehr University of Medical Sciences with ethics number IR.BPUMS.REC.1394.161.

4. Results

Out of 378 participants, 196 (51.9%) were women. The mean age of the participants was 32.3 ± 7.9 years. About 71% (N = 268) of the individuals were married; 15.8% (N = 58) had a low educational level; 43.7% (N = 165) were unemployed; and 60.1% (N = 227) reported a low-income level.

Descriptive statistics for the mental health literacy and health-promoting behaviours were shown in Table 1. Participants had the highest score in the spiritual growth subscale and the lowest score in physical activity subscale.

Testing the first and second criteria showed that there was a statistically significant difference in MHL score and personal/ family mental disorder history ($P = 0.004$), and high education level ($P < 0.001$). Participants with low education (primary or diploma education) as well as individuals without personal/or family mental disorder history both had a lower mean MHL score. Also, a significant difference was revealed in the HPLP and marital status ($P = 0.013$), employment status ($P = 0.028$), personal/family mental disorder history ($P = 0.035$), and education level ($P < 0.001$). Association between demographic variables and MHL and health-promoting behaviours were shown in Table 2.

Pearson's correlation coefficients between MHL, health-promoting behaviours and age are given in Table 3. A significant association was found between MHL and HPLP, and all its subscales. Therefore, the individuals who had higher MHL were reported to have higher health-promoting behaviours. There were no significant correlations between the MHL, HPLP, and its subscale scores in terms of age.

For the third criterion, at first, demographic variables as independent variables and HPLP as the dependent variable were entered in the multiple regression model. Education level predicted health responsibility and physical activity. Nutrition subscale was predicted by education level, marital status, and gender. Education level, history, marital status, gender, and employment status were selected

Table 1. Means, Standard Deviations, Minimum, and Maximum of HPLP and its Subscales (N = 378).

Variables	MHL	Health Responsibility	Physical Activity	Nutrition	Spiritual Growth	Interpersonal Relations	Stress Management	HPLP. Total Score
Mean ± SD	102.75 ± 10.17	20.45 ± 4.74	18.95 ± 4.06	22.93 ± 4.49	25.35 ± 5.16	23.54 ± 4.41	21.24 ± 4.23	131.26 ± 22.96
Min - Max	59 - 136	9 - 36	8 - 32	9 - 36	9 - 36	9 - 35	8 - 32	52 - 203
Range scale	35 - 160	9 - 36	8 - 32	9 - 36	9 - 36	9 - 36	8 - 32	52 - 208

Table 2. Independent T Test and One- Way ANOVA Analysis of Demographic Variables with MHL, HPLP and its Subscales (N = 378)

Variables	MHL	Health Responsibility	Physical Activity	Nutrition	Interpersonal Relationship	Spiritual Growth	Stress Management	HPLP. Total Score
Gender								
Male	102.45 ± 9.39	20.39 ± 4.79	19.10 ± 4.21	22.62 ± 4.47	23.41 ± 4.60	24.91 ± 5.29	20.86 ± 4.43	130.10 ± 24.06
Female	103.02 ± 10.88	20.50 ± 4.72	18.81 ± 3.93	23.21 ± 4.52	23.69 ± 4.23	25.78 ± 5.01	21.60 ± 4.03	132.34 ± 21.98
T-value	-0.545	-0.213	0.675	-1.243	-0.615	-1.603	-1.667	-0.862
Marital status								
Married	102.31 ± 10.48	20.76 ± 4.68	19.06 ± 4.01	23.42 ± 4.43	23.85 ± 4.27	35.75 ± 4.97	21.32 ± 4.25	133.29 ± 22.39
Single	103.94 ± 9.27	19.65 ± 4.85	18.66 ± 4.18	21.66 ± 4.44	22.81 ± 4.67	24.44 ± 5.50	21.07 ± 4.20	126.18 ± 23.79
T-value	-1.422	1.997[a]	0.853	0.419[b]	0.356[a]	0.206[a]	0.771	2.497[a]
Employment status								
Employed	103.20 ± 10.73	20.89 ± 4.92	19.47 ± 4.35	23.48 ± 4.64	23.85 ± 4.23	25.94 ± 5.14	21.67 ± 4.19	133.83 ± 22.95
Unemployed	102.14 ± 9.55	19.94 ± 4.48	18.32 ± 3.62	22.27 ± 4.30	23.12 ± 4.68	24.53 ± 5.07	20.63 ± 4.27	128.00 ± 22.94
T-value	0.981	1.900	2.650[b]	2.485[a]	1.537	2.577[a]	2.293[a]	2.205[a]
Income level								
Low	106.96 ± 10.68	21.18 ± 4.77	20.24 ± 3.45	25.14 ± 4.56	25.76 ± 5.23	27.36 ± 4.35	21.64 ± 3.21	139.12 ± 21.65
High	102.62 ± 10.09	20.36 ± 4.71	18.80 ± 4.04	22.84 ± 4.49	23.34 ± 4.34	25.76 ± 5.23	21.14 ± 4.29	130.72 ± 22.97
T-value	1.986	0.794	1.587	2.275[a]	2.442[a]	1.969[a]	0.526	1.469
History								
Yes	107.35 ± 11.05	19.24 ± 3.19	17.75 ± 3.19	21.86 ± 3.25	22.35 ± 3.72	23.20 ± 4.61	19.36 ± 3.49	123.16 ± 17.06
No	102.25 ± 9.96	20.59 ± 4.87	19.09 ± 4.13	23.06 ± 4.60	23.67 ± 4.46	25.58 ± 5.16	21.45 ± 4.26	132.18 ± 23.38
T-value	2.930[b]	-1.641[a]	-1.882[a]	-1.531[a]	-1.658	-2.617[b]	-2.846[b]	-2.118[a]
Education level								
Primary	99.83 ± 9.01	20.79 ± 4.74	18.65 ± 4.06	22.65 ± 4.43	23.81 ± 4.51	24.13 ± 5.45	21.33 ± 5.03	128.00 ± 22.86
Diploma	100.35 ± 10.20	19.96 ± 4.68	18.49 ± 3.85	22.31 ± 4.32	23.04 ± 4.80	24.50 ± 4.84	20.28 ± 3.75	127.48 ± 22.18
Bachelor	104.50 ± 9.79	20.18 ± 4.57	19.03 ± 4.12	22.89 ± 4.36	25.85 ± 4.50	25.70 ± 5.05	21.41 ± 4.07	131.89 ± 22.68
Master or more	108.03 ± 10.88	23.46 ± 5.85	21.18 ± 4.11	26.61 ± 4.61	23.55 ± 4.41	29.11 ± 4.74	24.40 ± 3.87	148.96 ± 20.55
F-value	8.468[b]	4.562[b]	3.378[a]	6.938[b]	2.982[a]	7.381[b]	6.974[b]	6.236[b]

[a] P < 0.05.
[b] P < 0.001.

in multiple regression analysis for spiritual growth. Education level and marital status predicted interpersonal relation; and education level, history, gender and employment status predicted stress management. MHL was predicted by education level and personal/family history of mental disorders. Therefore, in the hierarchical model of HPLP, spiritual growth and stress management, demographic variables such as education level and history of mental disorders were entered. In other hierarchical models only educational level was entered.

Table 4 displays β coefficients, $R^{2,}$ adjusted R^2, and F value for Model I which includes only demographic vari-

Table 3. Correlation of Coefficient between MHL, HPLP, and its subscales (N = 378)

Variables	Age	MHL	HPLP	HR	PA	Nut	SG	IR	SM
Age	1								
MHL	0.025	1							
HPLP	0.042	0.228[a]	1						
HR	0.067	0.152[a]	0.817[a]	1					
PA	0.017	0.164[a]	0.848[a]	0.714[a]	1				
Nut	-0.153	0.199[a]	0.829[a]	0.639[a]	0.660[a]	1			
SG	0.034	0.177[a]	0.878[a]	0.582[a]	0.636[a]	0.634[a]	1		
IR	0.026	0.178[a]	0.878[a]	0.634[a]	0.648[a]	0.660[a]	0.775[a]	1	
SM	-0.018	0.184[a]	0.888[a]	0.641[a]	0.675[a]	0.644[a]	0.809[a]	0.766[a]	1

Abbreviations: HR: Health Responsibility; IR: Interpersonal Relation; Nut: Nutrition; PA: Physical Activity; SG: Spiritual Growth, SM: Stress Management.
[a] $P < 0.001$.

ables and for model II after entry of demographic variables and MHL. The model II indicated a statistically significant contribution of MHL in all the health-promoting behaviours and there was an increment of predictive capacity as R^2, adjusted R^2, and F value increased in model II compared to model I. Also, the education level was the strongest significant predictor for all health-promoting behaviours, and in model II MHL presented a statistically significant contribution in predicting health-promoting behaviours and functioned as a mediator between education level and health-promoting behaviours (decreased β coefficient). MHL was, however, not a mediator between history of mental disorders and HPLP, spiritual growth, and stress management.

5. Discussion

In this study, we explored the association between personal/family history of mental disorders, and education level with MHL, the association of the demographic variables except gender and age with health-promoting behaviours, and explored the mediation of MHL that links education level to health-promoting behaviours.

In this study, having personal/family history of mental disorder was associated with higher MHL score. In accordance with the findings of this study, several studies have shown that psychological symptoms can impact certain aspects of MHL (22-25). One possible explanation for these findings is that the individuals with personal or family history of mental disorders may be psychologically-minded, and emotionally aware. Similar to the findings of this study, several studies showed that education is consistently associated with mental health literacy (23, 24, 26, 27).

In this study, HPLP scores increased with increasing education. This study shows the importance of education in engaging health-promoting behaviours. Education was not only related to the total HPLP score but was also significantly related to all its subscales, indicating that more education was related to more active engagement in healthy lifestyle behaviours. The importance of education has also been supported by previous studies in which people with more education had healthier lifestyles (28-30). We also found healthier profiles in married vs. single. The same conclusion was reached by several studies (28, 30). Thus, it appears that married participants pay more attention to their health responsibility, nutrition, interpersonal relation, and spiritual health. The average total HPLP score and scores for all six HPLP subscales except interpersonal relation were significantly higher for respondents without a history of mental disorder compared with respondents who have a history of mental disorders. Consistent with the findings of recurrent study, several studies found that the people with mental disorder such as Schizophrenia have fewer health-promoting behaviour than non-psychiatric subjects or the general population especially have poor dietary patterns, and more sedentary behaviours (31-33).

In this study, MHL had a positive and significant correlation with all the health-promoting behaviours that indicated subjects with higher MHL were more likely to have health-promoting behaviours. More studies conclude that high levels of health literacy are associated with higher levels of health promotion behaviours (6, 14-17). But in our searches, no studies were found in this field. As defined in this study, MHL incorporates two important components including the awareness of the problems and the attitude towards seeking appropriate help. Based on different models of health behaviours, such as the theory of planned behaviour, attitude plays a very important role in the implementation of the target health behaviour (34). A positive attitude has a direct influence on the intention to perform the health behaviour and, in turn, induces the actual per-

Table 4. Hierarchical Multiple Regression Analysis to Predict Health Promotion Behaviours (N = 378)

Variables	HPLP		Health Responsibility		Physical Activity		Nutrition		Spiritual Growth		Interpersonal Relation		Stress Management	
	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II	Model I	Model II
Education level														
Primary (Ref)														
Diploma	-0.007[a]	-0.018[a]	-0.080[a]	-0.083[a]	-0.018[a]	-0.026[a]	-0.035[a]	-0.042[a]	0.035[a]	0.030[a]	-0.081[a]	-0.088[a]	-0.110[a]	-0.113[a]
Bachelor	0.078[a]	0.029[a]	-0.064[a]	-0.093[a]	0.046[a]	0.011[a]	0.026[a]	-0.011[a]	0.144[a]	0.106[a]	-0.042[a]	-0.081[a]	0.001[a]	-0.038[a]
Master or more	0.240	0.183	0.151	0.122	0.164	0.130	0.230	0.191	0.250	0.213	0.119	0.080[a]	0.182	0.141
History														
Yes	-0.110	-0.144	-	-	-	-	-	-	-0.125	-0.153	-	-	-0.138	-0.166
No (Ref)														
MHL	-	0.208	-	0.135	-	0.136	-	0.161	-	0.156	-	0.162	-	0.171
R^2	0.069	0.108	0.037	0.054	0.028	0.045	0.056	0.080	0.074	0.096	0.025	0.049	0.075	0.101
Adjust R^2	0.057	0.094	0.029	0.043	0.019	0.034	0.048	0.070	0.064	0.083	0.016	0.038	0.064	0.089
F value	5.711	7.440	4.562	5.094	3.378	4.185	6.938	7.637	7.102	7.512	2.982	4.567	7.132	7.935

[a] It's not significant.

formance of the behaviour (34). According to this concept, positive attitude towards help seeking would probably induce an actual behaviour in promoting health and thus results in health-promoting behaviours (35).

The hierarchical multiple regression analyses indicated that MHL is a significant predictor and mediator to the health-promoting behaviours. Educational level, and history of mental disorders tended to have direct effects on health-promoting behaviours. MHL was found to be significant mediating factor through which education level indirectly affect all health-promoting behaviours. Findings of this study showed the importance of education in MHL and in the engaging in health-promoting behaviours. One possible explanation of these positive relationships is that increasing education will increase awareness about health problems (one of the components of MHL) and individuals with high level of MHL are more knowledgeable about health matters and health risk factors; and therefore, are more likely to perform all the health-promoting behaviours (28).

Personal/ family history of mental disorder had only a direct effect on health-promoting behaviours. The experience of mental disorders increases awareness about mental health problems and changes attitude, therefore increases mental health literacy (22-25). But individuals with mental disorders perform fewer health-promoting behaviours (31-33). So, promoting mental health literacy after the experience of mental disorders cannot lead to health behaviours.

5.1. Conclusion

This study showed that there is an association between MHL and all health-promoting behaviours. These results indicate that MHL is a significant predictor of health-related behaviours and in addition to the direct effect on health behaviour, mediates the effect of academic education level on these behaviours. Therefore due to communication barriers and little acculturation into the persons with low literacy, there persons are less likely to have participation in the health care market and the health promotion programs. Therefore, considering the difficulty of improving individual education level, design and implementation of suitable and effective educational interventions for improving mental health literacy n these persons are necessary to promote health behaviours. Whereas there was found a significant association between MHL and health promoting behaviours, health professionals should conduct MHL assessment prior to designing health education programs.

This study has several limitations due to its cross-sectional design, such as selection bias. However, the response rate in this study was appropriate (87.9%), which suggests a well-covered sample. Also, this study was based on a convenience sample, so that its findings may not be generalized to all people. In our searches, no studies were found in this field; therefore, the discussion might be poor. The replication of these findings in future studies is required.

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Footnotes

Authors' Contribution: Azita Noroozi contributed to the critical revision of the manuscript, as well as the final approval of the study. Rahim Tahmasebi contributed to

the study design, data analysis, and auditing and drafting of the article. Also, Farzaneh Khademolhosseini and Hamideh Lari contributed to the provision and collection of the data.

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