



Is There a Relationship Between Health-Promoting Lifestyle and General Health Among Working Women? Evidence From Iran

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Abstract

Background: Iran is in transition from tradition to modernity, and women employees are doubly laden with this transition. The assessment of lifestyle and its relationship with the general health of women working for universities (as the progressive organizations) can pave the way for designing and applying the ideas of health-promoting organizations.

Objectives: The aim of this study was to measure the relationship between health-promoting lifestyle and general health among women working in the public universities of Lorestan province, Iran.

Methods: This is a cross-sectional study. The statistical population consists of all the women working for Lorestan University and Lorestan University of Medical Sciences in 2016. The sampling method was stratified random. The instruments were the valid and reliable Health-Promoting Lifestyle and General Health questionnaires. The data were analyzed by means of the SPSS-20 software and tests such as Pearson's Coefficient of Correlation, the Independent *t*-test, and regression models.

Results: The mean scores of women's health-promoting lifestyle in Lorestan University of Medical Sciences and those of Lorestan University were respectively 51.92 ± 14.4 and 53.43 ± 12.7 . The mean scores of women's general health in above-mentioned universities were respectively 27.98 ± 13.51 and 26.42 ± 11.76 . There was a significant correlation between the health-promoting lifestyle and the general health scores among the above-mentioned women ($r = 0.45$, $P < 0.001$).

Conclusions: Health-promoting lifestyle is a good predictor of general health among working women. Therefore, in order to promote general health among working women, it is recommended that their recruiting organizations provide the necessary regulations, facilities, and processes for their adoption of a health promoting lifestyle.

Keywords: Health-Promoting Lifestyle, General Health, Self-Rated Health, Women, Iran

1. Background

It is obvious that the Iranian society is in transition from tradition to modernity and the employed women are bearing the huge burden of this transition. Such women benefit from better social and economic opportunities and conditions in comparison with unemployed women. They opt for different lifestyles according to their tastes, interests, circumstances, and needs. With the entry of women into the labor market, they have been influenced by jobs and organizational culture and their lifestyle has become different from that of the women who are not employed (1). Health-promoting lifestyle is the main strategy to maintain and enhance health. Attention to women health, constituting half of the population, exerts its impact on the

health of families as well as the society (2, 3).

Lifestyle entails all the behaviors that are under the control of individuals and that affect their health risks. Dietary habits, physical activity, sleep and rest, weight management, immunization against disease, compatibility with stress, and the ability to benefit from the support of family and society are also among lifestyle behaviors (4, 5).

Many health problems, such as obesity, cardiovascular diseases, different types of cancer, and addiction currently available in most countries, especially developing countries, are associated with individuals' lifestyle changes (6). World Health Organization's study on health behaviors in 35 countries across the world showed that nearly 60% of people's quality of life and health depends upon their

lifestyle (7). It has been predicted that non-communicable diseases pertaining to lifestyle would be the cause of seven out of 10 deaths in developing countries by 2020 (8). Lifestyle promotion helps maintain and improve health in such a way that the application of positive behavioral patterns in life leads to individual health promotion (9, 10). HPLPII is a construct associated with health promotion of lifestyle that contains six dimensions, namely physical activity, nutrition, health responsibility, spiritual growth, interpersonal relations, and stress management (11). Health-promoting behaviors are an integral part of such individuals' lifestyle and determinant of their health (12).

General health (GH) has been recognized as an international standard that has a particular application for measuring the health status of the individuals in a community in research on general health and epidemiology (13). The most common health assessment index of global consensus is expressed as follows: How would you assess your current health (14)? The results of several studies have revealed that GH, particularly if done periodically, is strongly related with objective measures of well-being, health consequences, or death. In other words, GH is a good predictor for the consequences and health risks in the individuals' life (15-19).

Several published studies have examined the relationship between HPLPII and GH among middle-aged women, hypertensive patients, and postmenopausal women (20-22). In a study among middle-aged Korean women (2007), there was a significant correlation between three dimensions of HPLPII (spiritual growth, interpersonal relationships, and nutrition) and GH (22). In another study among menopausal women in Langroud-Iran (2017), there was a significant correlation between HPLPII and their general health (20). However, we did not find a published study that examines the relationship between HPLPII and GH among employed women.

Assessment of health-promoting lifestyle and its relationship with general health of the women employed in universities as leading organizations in the society can provide valuable clues for the design and implementation of the ideas issued by health promoting organizations. However, rarely was a study examining the relationship between employed women's HPLPII and their GH found in Iran.

2. Objectives

The present study was an attempt to assess HPLPII and GH and to determine their relationship in women employed in public universities of Lorestan. With the proof

of the relationship between GH and HPLPII among employed women, it is possible to take measures in improving their health through the growth and expansion of health-promoting lifestyle.

3. Methods

This is a cross-sectional study. All the women employed as the staff of Lorestan University (LU) and Lorestan University of Medical Sciences (LUMS) at 2016 constituted the population study. The criteria for the acceptance of the sample units in this study included the following: at least having two years of work experience, willingness to participate in the study, and suffering from no chronic and incurable diseases, such as diabetes, epilepsy, seizures, cancer, and disability. For calculating the sample size, a pilot study with 20 samples (each research setting 10 samples) was conducted. The following formula was used for calculating the sample size ($r = 22$; $\beta = 0.20$; $\alpha = 0.05$):

$$n = \left[\frac{Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}}{\frac{1}{2} \log \frac{1+r}{1-r}} \right]^2 + 3$$

The estimated sample size of the study equaled 159 participants. For sampling, LU and LUMS were considered as strata and their deputies were considered as sub-strata. Then, the samples were selected randomly proportional to size. The data collection instruments employed here included the following four parts: The first part consisted of demographic information (age, marital status, number of children, weight, height, income, and infection with certain diseases). The second part contained Walker et al.'s Health Promoting Lifestyle Profile II (HPLP-II) scale whose Persian version was validated inside the country in 2013 by Mohamadian et al. (11). This questionnaire contains 52 items that are answered using a 4-point Likert scale (1 = never, 2 = sometimes, 3 = often, and 4 = routinely). This instrument measures health-promoting behaviors in six sub-scales as follows: (7 items pertaining to nutrition), (11 items pertaining to spiritual growth and self-actualization), (13 items pertaining to health responsibility), (8 items pertaining to interpersonal relations), (7 items pertaining to physical activity), and (6 items pertaining to stress management). Overall, HPLPII score and the score of behavioral dimensions are calculated using the mean value of responses for all the 52 items and each sub-scale (eight to nine items). The lifestyle scores higher than 70%, within the range of 30% - 70%, and less than 30% were considered to be desired, average, and undesirable, respectively. The third part included Goldberg and Hillier's 28-item General Health questionnaire that was validated by Malakouti et

al. in 2007 in the country (23). This questionnaire encompassed four sub-scales, namely somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression where each sub-scale contained seven items. For the calculation of the sum of scores, response to option a, b, c, and d were assigned zero, one, two, and three points, respectively. Health self-assessment scores were interpreted as follows: 0 - 22 representing desired health, 23 - 40 representing slight illness, 41 - 60 representing mild illness, and 61 - 84 representing severe illness. The fourth part was comprised of one question regarding health self-assessment that had been used in various studies, including the study carried out by Vahdaninia et al. (13), for the assessment of the health status. For better perception of the scores and their comparability, they were standardized on the basis of 100. Before administration, the authorities' confirmation on the conduct of the research was obtained. Preceding the data collection stage, the research objectives were explained to the participants and the questionnaire was distributed among them, in case of their consent. For data analysis, SPSS-20 software, Pearson Correlation coefficient, Independent *t*-test, and regression models were used. The enter method was used for selecting the variables in multivariable Linear Regression.

4. Results

A response rate of 93.7% was achieved here. In this study, 159 women employed at LU as well as LUMS were studied, 65.4% of whom (n = 104) were employed at LUMS and the remaining 34.6% (n = 55) were employed at LU. The mean value of the women's age was 35.97 ± 6.40 . In terms of marital status, 66.7% of the employed women in LU and 72% of them in LUMS were married. With regard to education degree, 94.6% of the participants in LU and 97.9% of the participants in LUMS had a bachelor or masters degree. In addition, body mass index (BMI) of the women employed in LU was obtained equal to 25.31 ± 3.07 , while this index equaled 24.98 ± 3.33 for the women employed in LUMS. The work experience of the participants in LU was 11.01 ± 6.53 years while this index was 13.06 ± 6.75 for the respondents in LUMS. It is also noteworthy that 60.58% of the individuals under study in LUMS had graduated in medical sciences majors. There was no significant difference between mean scores of age, BMI, and work experience of women employed in two universities ($P = 0.12$, $P = 0.57$ and $P = 0.07$, respectively).

The mean score of HPLPII was obtained equal to $52.76\% \pm 13.43$ for the whole sample; this value was equal to $53.43\% \pm 12.17$ and $51.82\% \pm 14.71$ for the participants employed in

Table 1. Significance Test of the Difference Between Dimensions of HPLPII Among the Women Employed in LU and LUMS

Variable	Mean \pm SD	P Value
Health-promoting lifestyle		
Nutrition		0.233
LUMS	49.3 ± 16.4	
LU	46.0 ± 15.5	
Physical activity		0.786
LUMS	31.0 ± 20.5	
LU	30.1 ± 16.8	
Responsibility for health		0.861
LUMS	53.2 ± 15.8	
LU	53.4 ± 14.6	
Interpersonal relationships		0.086
LUMS	55.3 ± 18.6	
LU	60.5 ± 15.2	
Spiritual growth		0.138
LUMS	58.7 ± 28.3	
LU	62.0 ± 16.3	
Stress management		0.943
LUMS	48.3 ± 16.7	
LU	48.4 ± 15.5	
Total		0.638
LUMS	51.92 ± 14.7	
LU	53.4 ± 12.1	
General health		
LUMS	27.98 ± 13.5	0.516
LU	26.4 ± 11.7	

LU and LUMS, respectively. The total mean value of 27.32 ± 13 was obtained for the general health of the entire sample; the mean values of 26.42 ± 11.76 and 27.98 ± 13.51 were obtained in this domain for the participants in LU and LUMS, respectively. Among studied women, 66% were healthy, 34% were suffering from mild to moderate illness, and none of them were suffering from severe illness.

According to Table 4, the employing university, marital status, education level, and age were not significantly correlated with GH ($P > 0.05$); however, HPLPII was significantly associated with GH ($r = 0.44$, $P < 0.001$). Given the amount of R^2 (0.18), the regression model could account for 18% of the variation in GH. Under the assumption of the stability of demographic variables (age, employment history, marital status, education level, income, disease suffering, the number of children, and body mass index), the

Table 2. Significance Test of the Difference Between Dimensions of GH Among Women Employed in LU and LUMS

Variable	Mean \pm SD	P Value
Physical symptoms		0.81
LUMS	33.6 \pm 18.4	
LU	34.3 \pm 17.7	
Anxiety and insomnia		0.58
LUMS	33 \pm 19.6	
LU	31.1 \pm 19.7	
Social dysfunction		0.12
LUMS	33.6 \pm 14.6	
LU	30.1 \pm 9.4	
Depression		0.42
LUMS	12.3 \pm 16.5	
LU	10.1 \pm 15.4	

mean value of GH score experienced a reduction of 0.4 for each unit of increase in lifestyle score, which is statistically significant.

On the whole, 13.4% of the women under study reported their health condition as bad and very bad, 28.7% of them reported it to be average, and 58% of them reported it to be very good.

The results of this study showed that age ($P = 0.7$), education level ($P = 0.73$), BMI ($P = 0.76$), marital status ($P = 0.78$), the number of children ($P = 0.49$), work experience ($P = 0.52$), and income ($P = 0.19$) did not have any significant relationship with HPLPII. In the same way, there was no significant relationship between demographic variables and GH.

The Correlation test between different dimensions of lifestyle and GH showed that the dimensions of lifestyle, namely nutrition ($P = 0.007$, $r = -0.21$), physical activity ($P = 0.05$, $r = -0.15$), interpersonal relations ($P < 0.001$, $r = -0.47$), health responsibility ($P < 0.001$, $r = -0.35$), spiritual growth ($P < 0.001$, $r = -0.54$), and stress management ($P < 0.001$, $r = -0.29$) were significantly correlated with GH. The highest correlation belonged to spiritual growth, whereas physical activity held the lowest correlation.

The correlation of different dimensions of HPLPII with GH was in the descending order as follows: Spiritual growth, interpersonal relations, health responsibility, stress management, nutrition, and physical activity.

5. Discussion

This study aimed to determine the relationship of HPLPII and its dimensions with GH among the women employed in public universities of Lorestan in 2016.

The results showed that HPLPII and GH were not different between the women employed in LU and those employed in LUMS. It is notable that the difference between the two universities was not statistically significant in terms of the demographic variables. In other words, the two groups under study were relatively homogeneous. Hence, it is possible to reject the hypothesis claiming the effect of demographic variables on the relationship of university type with HPLPII and GH among the participants as well as to accept the above finding more confidently. Indeed, the above finding shows that knowledge, belief, and accessibility do not necessarily lead to behavior, and other intervening factors play some role in this domain. Thus, it is suggested that behavioral change theories, such as health belief model or theory of planned behavior be applied for the identification of the factors related to health promoting lifestyle among employed women.

The mean value of lifestyle score was at a moderate level for the women working in public universities of Lorestan province (52.7). HPLPII, among middle-aged women in Yazd-Iran (2011) and women of reproductive age in Shiraz-Iran (2013), measured by the same instrument, were 54.6% and 55.6%, respectively (24, 25). Universities are considered the leading organizations in each society; thus, the level of HPLPII in the women employed in universities was expected to be desirable, however, there was a moderate level of HPLPII among them. The comparison of the findings of this study, with the results of above mentioned studies, suggests that the women working in public universities did not only not hold a higher level of HPLPII than the general population women, but their mean score was slightly lower than that of the general population of women.

The studied employed women had the highest score of HPLPII in spiritual growth and the lowest in physical activity. This finding was confirmed by the results of the Yazd-Iran study (2011) among middle-aged women (24). Differences in the score of HPLPII dimensions can be attributed to the infrastructure and facilities to adopt health-promoting lifestyle. Therefore, policy makers and managers are advised to provide the necessary facilities of physical activity for employed women.

In this study, 66% of the subjects were healthy, 34% were suffering from mild to moderate illness, and none of them were suffering from severe illness. The absence of

Table 3. Correlation of the Demographic Variables, HPLPI, and GH Among Working Women^a

Variable	Health-Promoting Lifestyle						Age	BMI	Work Ex- perience	General Health
	Nutrition	Physical Activity	Responsibility for Health	Interpersonal Relationships	Spiritual Growth	Stress Man- agement				
Nutrition										
LU	1	0.367 [*]	0.511 [*]	0.539 [*]	0.411 [*]	0.410 [*]	0.168	0.147	0.118	0.155
LUMS	1	0.499 [*]	0.698 [*]	0.592 [*]	0.606 [*]	0.512 [*]	0.088	0.023	-0.032	-0.274 [*]
Physical activity										
LU		1	0.428 [*]	0.414 [*]	0.291 [*]	0.430 [*]	0.164	0.258	0.216	-0.205
LUMS		1	0.469 [*]	0.396 [*]	0.490 [*]	0.564 [*]	- 0.118	- 0.067	-0.022	-0.135
Responsibility for health										
LU			1	0.525 [*]	0.611 [*]	0.429 [*]	0.110	0.062	0.165	-0.340 [*]
LUMS			1	0.713 [*]	0.702 [*]	0.641 [*]	0.010	0.007	-0.045	-0.359 [*]
Interpersonal relationships										
LU				1	0.743 [*]	0.575 [*]	0.015	0.050	0.008	-0.462 [*]
LUMS				1	0.732 [*]	0.484 [*]	0.017	- 0.135	0.029	-0.471 [*]
Spiritual growth										
LU					1	0.441 [*]	0.076	0.030	0.017	-0.614 [*]
LUMS					1	0.678 [*]	- 0.032	0.065	0.026	-0.513 [*]
Stress management										
LU						1	0.152	0.059	0.139	-0.289 [*]
LUMS						1	0.000	- 0.027	0.012	-0.291 [*]
Age										
LU							1	0.047	0.864 [*]	-0.010
LUMS							1	0.137	0.881 [*]	-0.011
BMI										
LU								1	0.065	0.042
LUMS								1	0.037	0.191
Work experience										
LU									1	-0.060
LUMS									1	0.006
General health										
LU										1
LUMS										1

^a P < 0.05.

severe illness among the women under study may be attributed to the method of access to them since the women with severe illness do not attend the workplace.

The mean score of GH among studied women was 27.32 ± 13; while this value among women living in suburbs of Zahedan-Iran (2017) was 28.46 ± 16.41 (26). Although the mean score of GH among women participating in two studies is very close, their mean age has a difference of

about ten years. All women participating in the current study were employed, while 96% of women participating in the Zahedan-Iran study (2017) were housewives. Education degree of 96% of the participants in the current study was bachelor or master, while 90% of the participants in the Zahedan-Iran study (2017) were illiterate or had elementary education. Comparison of the demographic characteristics of women participating in these two studies

Table 4. Multivariate Regression Model of Predicting GH Based on HPLPII and Some Demographic Variables Among Working Women^a

Variable	Not Standardized β Coefficient	Standardized β Coefficient	SE	P Value
Constant	30.261	-	10.730	0.006
University	1.210	0.480	2.051	0.556
Marital status	-1.624	-0.06	2.378	0.496
Level of education	0.325	0.04	0.681	0.634
Age	0.02	0.01	0.160	0.901
BMI	0.624	0.167	0.316	0.051
HPLPII	-0.372	-0.4	0.076	< 0.001

^a $R^2 = 0.18$.

shows that GH of women's may not be related to factors such as age, education, and employment status; however, this matter needs to be investigate more.

There was no significant relationship between demographic variables (education level, body mass index, marital status, employment history, income, and age) and HPLPII among the women under study. In terms of education level, 91% of the women held bachelor and master's degrees (44% = bachelor's degree, 47% = master's degree). Thus, the absence of any significant correlation between education level and HPLPII can be attributed to the distribution proximity of educational level among the vast majority of them. With regard to income, 83.6% of the participants received monthly payments between \$300 to \$600. Similarly, the non-significance of the relationship between income and HPLPII can be ascribed to the relatively similar income distribution of the women under study.

It is probable that the women's age has been effective in the relationship between marital status and HPLPII; however, the relatively similar age distribution in both single and married women does not confirm this hypothesis. In two cross-sectional studies (2012 and 2011), there was no significant correlation between marital status and HPLPII among middle-aged women in Turkey and Iran, respectively (24, 27); however, in another cross-sectional study (2007), there was a significant correlation between marital satisfaction and HPLPII among Korean middle-aged women (22). It seems that quality of marriage, not itself merely (being single or married), is related to the HPLPII.

More than half of the women in this study (58%) assessed their general health as good and very good, 28.7% assessed it as neither good nor bad, and 13.4% of them assessed it as bad and very bad. In a study of health, from the perspective of the people of Iran by Vahdaninia et al. (13), in 2011, about 71%, 22.3%, and 5.3% of the country population reported their health status as good and very good, neither

good nor bad, and bad and very bad, respectively. It is notable that the people of Lorestan province had the lowest mean score of health in that study. It seems that the health status of the respondents has been affected by gender, employment, and ethnicity. HPLPII of employed women is a good predictor of their general health status (0.4). It is recommended that the prediction power of other general health-related factors, such as health literacy and health care utilization be examined in comparison with HPLPII.

The correlation of different dimensions of HPLPII with GH followed the descending order as spiritual growth, interpersonal relations, health responsibility, stress management, nutrition, and physical activity. The items of spiritual growth share high internal consistency with general health questions. Researchers have questioned the content validity of the dimension of spiritual growth as representative of HPLPII and, thereby, its content validity is suggested to be reassessed. Since the questions in the pertaining questionnaire mainly assess mental health, the high correlation of interpersonal relations and low correlation of nutrition and physical activity with general health dimensions were expected. The items of health responsibility bear much resemblance with the items of Assessment of Health Literacy Scale. Despite the researchers' expectation, nutrition and physical activity dimensions were not significantly correlated with physical health and mental health dimensions, respectively.

This study is the first published study that investigates the relationship between HPLPII and GH among working women. Another advantage of the present study is that it addresses the general health status and lifestyle of the employed women as a vulnerable subgroup in those societies that are in transition from tradition to modernity. This study was done on the women employed in public universities and there was not the possibility of investigating the relationship of employment and its type with HPLPII

and GH. Thus, it is suggested that researchers interested in this area design and conduct case-control studies to examine the above relations. The results of this study cannot be generalized to non-employed women and even to other employed women.

Although universities are regarded as the leading organizations in each society and the levels of HPLPII and GH are expected to be desirably high among the women employed in universities, these levels were moderate and mildly ill, respectively. HPLPII is a good predictor of GH. Therefore, it is recommended to design and implement the program of health-promoting organizations in the cities of the country in order to promote the general health of employed women. The ranking of organizations in terms of the implementation of the above program and receipt of the health-promoting organization award can contribute to the improvement of the employed women's general health and lifestyle.

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Footnotes

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