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The Relationship Between General Health and Health-promoting Behaviors in Workers at the Organic Fertilizer Production and Recycling Company of Isfahan's Municipality, 2015

ALIREZA ABEDIJONDANI[1] and SHAYESTEH SALEHI[2]*

[1]MSc. of Nursing Education, Nursing and Midwifery School, Islamic Azad University, Isfahan (khorasgan) Branch, Isfahan, Iran.
2PhD of Educational Management, Nursing and Midwifery School, Islamic Azad University, Islamic Azad University, Isfahan(Khorasgan) Branch, Isfahan, Iran.
*Corresponding author E-mail: abedijo55@yahoo.com

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ABSTRACT

Workers' general health in different dimensions is an important issue in working environment. This study was conducted with the aim of determining the relationship between general health and health-promoting behaviors in workers employed in Isfahan's organic fertilizer production and recycling Company. This study is cross-sectional and of descriptive-correlation type. The statistical population included 119 individuals out of all workers employed in various units of the Isfahan's organic fertilizer production and recycling Company. Considering the limitation, the samples were chosen in the form of census. The information was collected from 100 workers. To investigate the general health, GHQ-28 questionnaire was used, and for evaluation of health-promoting behaviors, HPLP II questionnaire were used. To analyze the data, inferential and analytical statistical tests were employed. The results indicated that considering general health problems, 61% of workers had no or minimum level of problem, 38% had a(psychologic) psychological problem, and 1% suffered from problems at a moderate level. With respect to health-promoting behaviors, 23% of workers were at a poor level, 73% were moderate, and only 4% lied within the range of good. Further, it was found that there is an inverse and significant relationship between health promoting behaviors across various dimensions and the sum of health promoting behaviors with the problems of general health in workers ($p<0.05$). Based on the obtained results, it is recommended that programs be planned to enhance health promoting behaviors in working environment and personal environment of workers by health experts as well as the relevant authorities, thereby facilitating conductance of these behaviors.

Key words: general health, health promoting behaviors, recycling workers.

INTRODUCTION

Since many centuries ago, healthy psychologic in a healthy body has been a social ideal[1]. Promotion and provision of health among people in society are important pillars of development[2]. According to World Health Organization, health is referred to complete physical, mental, and social welfare, and not just lack of disease, member defect, or disability. Accordingly, a healthy individual is a person who is healthy physically, mentally intact, socially active, politically conscious, economically generative, and culturally responsible[3]. Mental and physical health in workers is of great importance[4].

A person with mental health enjoys three major characteristics including sense of ease, a proper sense towards others, and the power of meeting life requirements. Mental health is a special

status of the psychologic that results in improved development and evolution of human personality, helping the individual to show adaptation towards themselves and others[5]. Research has shown that the cause of many chronic diseases is lifestyle and human behaviors[6].

Health promoting behaviors are among the most important factors in prevention and treatment of diseases. Lack of awareness and indifference to this issue due to some socioeconomic factors, personality characteristics, as well as physical and psychological disorders destabilizes the ground of public health and subjects it to serious damage[7].

All attempts that are considered for protection against diseases and establishment of a healthy life are called "healthy lifestyle"[8]. The majority of chronic diseases including cardiovascular diseases, cancers, diabetes, and even accidents are significantly preventable through a healthy lifestyle and paying attention to health promoting behaviors[9].

In general, health can be influenced by having knowledge about health, healthy and right behaviors, health status, accountable decision-making, use of coping skills, enjoying protective factors, flexibility, and possessing health literacy[10].

Work has a corollary and importantrole in the life of all people. Although it is a means for subsistence in the life and keeping self-esteem of individual, it is also a source of constant damage and stress. Therefore, identification of the factors affecting physical and mental health of employees seems to be essential[1]. One of the main determining factors in enhancing the productivity of workforce and developing service delivery in each organization is related to the high level of health among the employees in that organization[4]. Today, the cost of chronic diseases associated with work is increasing in working environments. This is itself a reason on existence of disease- generating factors such as job stress, etc. in the working environment[11].

Carrying out a proper and flawless investigation about the working conditions and health of workers in countries can contribute to undertaking significant steps towards developing a formal and permanent information system regarding working conditions and health of workers[12]. Based on the statistics presented about the main causes of mortality, 53% is related to lifestyle and unhealthy behaviors, 21% is associated with environmental factors, 16% can be traced back to genetic factors, and 10% goes back to healthcare service systems[13]. Over 70% of mortalities in the US is caused by chronic diseases, also about 75% of the healthcare costs is related to chronic diseases. The high prevalence of them can be related to unhealthy lifestyles and known healthy behaviors[14]. Research has revealed that the probability of retirement among workers is higher in low socioeconomic classes due to disability caused by physical and mental disorders[15].

Studies have shown that known healthy behaviors are important in the extent of disability during retirement. It can also affect the rate of attrition and disability during employment.Therefore, paying attention to promoting healthy lifestyle and healthy behaviors. among workers, associated with the extent of ability in the job and reduction or elevation of productivity in them, should be taken into consideration[16].

As workers employed in urban waste management factories are exposed to infections and other health problems due to contact with waste infective and non-infective materials and are thus more prone to decreased general health, and considering scarcity of studies in this regard, this study was designed and implemented with the aim of determining the relationship between general health and health promoting behaviors among workers in organic fertilizer production and recycling company in Isfahan municipality. This project can also provide authorities with valuable information to plan proper measures based on the results, analyses, and the relationships between factors, thereby providing the ground for promotion of health among workers[18,17].

MATERIALS AND METHODS

This study is of descriptive-correlational type and is cross-sectional. The statistical population consisted of all workers employed across different

units of the organic fertilizer production and recycling factory of Isfahan municipality, summing to 119 individuals. All workers were male with a mean age of 35.44. Naturally, considering the limitation of the statistical population, census was chosen as the sampling method. Out of this number, 19 individuals rejected to participate in the research or complete the questionnaire. Eventually, 100 workers were selected as the sample and consented to completing and returning the questionnaires. Being employed as a worker in each of the units in the organic fertilizer production factory and informed willingness and consent to participate in the research were chosen as the inclusion criteria. The exclusion criteria were improper responses to the questionnaires and lack of willingness to participate in the study. The instrument applied in this study consisted of two questionnaires called general health measurement standard (GHQ-28) and determination of health promoting behaviors (HPLPII) based on Pender model. The general health questionnaire consists of 28 questions: area of physical symptoms (7 questions), anxiety symptoms (7 questions), social function (7 questions), and depression symptoms (7 questions). This questionnaire was first published by Goldberg in 1972, with the aim of differentiating between healthy and diseased individuals (19). Its 28-question version was developed in 1979 by Goldberg and Hiller. The reliability and validity of its Persian version have also been confirmed[11]. This instrument is scored based on a Likert scale through 4 degrees of 0, 1, 2, 3. A lower score represents higher level of general health in a person, with the final score of every individual lying within the range of 0-84 [18]. At every scale, a score of 6 and above, and in total 22 above represents pathological symptoms. The review of investigations conducted in Iran indicates that the reliability and validity of this test varies from 0.84 to 0.94 with a slice of 6 and from 0.68 to 0.93 with a slice of 23 [20].

The questionnaire of the evaluation of health promoting behaviors consists of two sections. The first is related to collection of information about demographic characteristics together with personal and occupational information of workers including gender, age, level of education, working background, marital status, etc., consisting of 15 questions. The second section includes HPLPII standard questions, a multidimensional evaluation of the health promoting behaviors based on Pender health promotion model. It determines the way health promoting behaviors are performed by people. This section of the questionnaire tests the extent of using healthy behaviors through 52 questions in six dimensions: responsibility in health (9 questions, maximum score: 36, minimum score: 9), physical activity (8 questions, max: 32, min: 8), nutrition (9 questions, max: 36, min: 9), spiritual growth (9 questions, max: 36, min: 9), stress management (8 questions ,max: 32, min: 8), and interpersonal relationships (9 questions, max: 36, min: 8). Considering the significance of protective behaviors (application of protective equipment such as helmets, mask, special clothes, gloves, and job-specific shoes) by workers, this dimension was added to the end of the questionnaire based on expert comments. Protective behaviors include five questions with the maximum score of 20 and minimum score of 5. The responses of each question are based on Likert scale ranging from never (1 score), sometimes (2 scores), often (3 scores), and always (4 scores)[21,22]. This instrument has been widely used in domestic and foreign research, whose reliability and validity have been confirmed[23]. In a study by MohamadiZeydiet al in 1390, with the aim of determining the reliability and validity of this questionnaire, the Cronbach alpha coefficient for the entire instrument was reported to be 0.82 and for the subscales was 0.64-0.91 [24].

Having obtained the permission of research from the research deputy of Islamic Azad University, Isfahan Branch and received ethical code from the ethics committee of Isfahan University of medical sciences with the number of 1394.4.93, and gained the confirmation of the officials in the Isfahan municipal recycling management organization during around six sessions in the research environment, and following presentation of sufficient explanations on confidentiality of the information and emphasizing the scientific objectives of the research, the questionnaires were completed and returned by the samples themselves. Due to insufficient educational level in completion of questionnaires, 52 were taken in person in the form of interview. Finally, following collection of the questionnaires, the obtained information was analyzed by Spss 20.

Findings

Based on the obtained results, it was found that from among the 100 workers present in the sample, in terms of age, the highest frequency (33%) was related to the workers within the range of 31-40 years of age. The mean age of workers was 35.44±10.02. In terms of education level, the highest frequency distribution was guidance and diploma education (30%). Furthermore, the majority of workers in the sample (82%) were married and 86% of them were dwelling in city. All samples consisted of male participants and no female worker was employed in this unit. In terms of the number of household members, 54% had 3-4 member families. The mean number of family members was 3.67±1.96. The results indicated that the majority of the workers in the sample (46%) had a normal weight and the mean BMI was 23.95±3.88. In addition, 67% of the research units had no diseases and among the workers with a background of disease, respiratory diseases had the highest frequency. As many as 77% of the workers did not smoke. It was also found that 23% of the workers were employed in the production line, 31% in the waste separation unit, and 46% in other units of the factory. In terms of working background, the highest frequency (32%) was related to the workers with a background of 1-5 years. The mean job background for the workers in the sample was 6.09±5.79. As many as 82% of the workers were day workers and 76% had an income lower than their costs. Further, the majority of workers (55%) did not have periodic examinations for investigation of their health status. According to the results in Table 1, in the dimensions of physical problems, anxiety and sleep problems, and depression problems, 72, 77, and 97% of workers, respectively did not have any or had minimal problems. However, in the dimension of social problems, 56% of the workers had some problems. In general, regarding general health problems, 61% of the workers had no or minimal problems, 38% had mild problems, and 1% had moderate problems.

Based on the results in Table 1, among the four dimensions of physical problems, anxiety and sleep problems, social problems, and depression problems in the general health, the depression problems dimension had the lowest mean (1.71±2.29) and the social problems

Table1: Absolute and relative frequency distribution and the average score of subjects based on general health problem and its dimensions

	Zero or the lowest level		mild		moderate		total		Score	
	number	%	number	%	number	%	number	%	mean	SD
Physical problems	72	72.0	20	20.0	8	8.0	100	100.0	5.03	3.58
Anxiety and sleep problems	77	77.0	19	19.0	4	4.0	100	100.0	4.49	3.34
Social problems	2	2.0	42	42.0	56	56.0	100	100.0	11.43	2.43
Depression problems	97	97.0	3	3.0	0	0.0	100	100.0	1.71	2.29
General Health problems	61	61.0	38	38.0	1	1.0	100	100.0	22.66	8.26

dimension had the highest mean (11.43±2.43). Moreover, the mean of all of the four subscales was lower than the cutting point of existence of pathological symptoms (Value of 6). The scores of workers from the entire general health questionnaire lied within the range of 8-47 with a mean of 22.66±8.26.

According to the results in Table 2, the majority of the workers present in the sample were poor in terms of health promoting behaviors in the dimensions of responsibility (52%), nutrition (53%), and physical activities (74%). However, in the dimensions of stress management (54%), spiritual growth (67%), and interpersonal relationships (72%), the highest observed frequency was related to the workers with a moderate level. Regarding the protective behaviors, the majority of workers (53%) were in the good range.

Overall, considering the health promoting behaviors, 23% of workers were poor, 73% were moderate, and only 4% were good. Based on Table 2, the mean scores of health promoting behaviors were related to protective behaviors with a value of 3.08 and the lowest mean was associated with physical activity with a mean of 1.73. Furthermore, the total score of health promoting behaviors out of the 57 questions ranged from 93 to 202 with a mean of 132.30±22.26.

According to Table 3, and based on the results obtained from calculation of Pearson correlation coefficient, no significant difference was observed between the physical problems and anxiety problems and various dimensions of health promoting behaviors ($p>0.05$). Except for the protective behaviors, in other dimensions of health promoting behaviors, a significant and inverse

Table 2: Absolute and relative frequency distribution and the average score of subjects based on health behaviors status and its dimensions

Behaviors status	poor		moderate		Good		score	
Dimenssion	number	%	number	%	number	%	mean	SD
Responsibility	52	52.0	44	44.0	4	4.0	18.57	4.37
Nutrition	53	53.0	42	42.0	5	5.0	18.77	4.22
Stress management	42	42.0	54	54.0	4	4.0	17.75	3.72
Spiritual growth	8	8.0	67	67.0	25	25.0	24.63	4.61
Interpersonal relationships	13	13.0	72	72.0	15	15.0	23.40	4.30
Physical activity	74	74.0	22	22.0	4	4.0	13.80	4.88
Protective behaviors	2	2.0	45	45.0	53	53.0	15.38	3.24
Health promoting behaviors	23	23.0	73	73.0	4	4.0	132.30	22.26

relationship was observed with the social problems of workers ($p<0.05$). In addition, another significant and inverse relationship was observed between the stress management, spiritual growth, interpersonal relationships, and the sum of health promoting behaviors with depression problems in the workers ($p<0.05$). A significant and inverse relationship was also observed between the health promoting behaviors in the dimensions of nutrition, stress management, spiritual growth, interpersonal relationships, physical activity, and the sum of health promoting behaviors with the general health problems in workers ($p<0.05$).

To examine the relationship between general health and the health promoting behaviors of workers, linear regression analysis was used. In this model, the general health variable and the health promoting behaviors variable were fed into the regression model as response and independent variables, respectively. The results indicated that with the increase in the score of health promoting behaviors in workers by 1 unit, the extent of general health problems declines by 0.092 in workers ($p<0.05$).

Table 3: The relationship between general health and health-promoting behaviors in subjects

General health	Physical problems		Anxiety problems		Social problems		Depression problems		General health problems	
Health promoting behaviors	Correlation coefficient	Significance level	Correlation coefficient	Significance level	Correlation coefficient	Significance level	Correlation coefficient	Significance level	Correlation coefficient	Significance level
responsibility	.122	.228	-.014	.892	-.259	.009*	-.179	.075	-0.79	.436
Nutrition	-.07	.486	-.026	.795	-.361	<.001*	-.172	.087	-.195	.048*
Stress management	-.09	.375	-.177	.078	-.287	.004*	-.211	.035*	-.253	.011*
Spiritual growth	.011	.913	-.153	.129	-.515	<.001*	-.285	.004*	-.288	.004*
Interpersonal relationships	.071	.480	-.125	.214	-.389	<.001*	-.276	.005*	-.211	.035*
Physical activity	-.01	.921	-.130	.197	-.410	<.001*	-.177	.079	-.227	.023*
Protective behaviors	-.021	.835	.029	.772	-.163	.105	.086	.397	-.022	.832
Health promoting behaviors	.006	.950	-.117	.245	-.463	<.001*	-.242	.015*	-.248	.013*

DISCUSSION

The results of this study revealed that considering general health, 61% of workers had no or minimal problems, 38% had mild problems, and 1% had moderate problems. In addition, 72, 77, and 97% were problem free or minimally challenged in physical, anxiety and sleep, and depression problems, respectively. However, 56% had moderate problems in social issues. Based on the obtained results, from among the four dimensions of general health problems, i.e. physical, anxiety and sleep, social, and depression problems, the dimension of depression problems had the lowest mean (1.71±2.29) and the social problems with a mean of (11.43±2.43) had the highest mean. The mean of all of the four subscales was lower than the cutting point of existence of pathological symptoms (value of 6). In the study by Kouhpayi *et al.,*[18] done for determining the level of mental health in workers of various industries in Ghom Province in 2014, it was found that disorders in the social function and depression symptoms had the highest and lowest levels, respectively, congruent with this research. However, this study is not congruent with the research by Mirmohamadi et al (25), who investigated the relationship between general health and job satisfaction in workers of Golestan Province slaughterhouses. In the study by Mirmohammadi, depression symptoms had the highest frequency, whereas disorders in social function had the lowest frequency. Furthermore, in the study by Gholami et al (26), who explored that status of general health in workers in one of the factories that manufactured electrical panels and power substations in Kerman, it was understood that 63.6% of individuals had unfavorable general health status. In terms of depression, 14.5% showed the lowest frequency. The results of this current research are not congruent with the results by

Gholami in terms of general health problems, but it is in line with it in terms of depression. In addition, this current research mentioned social disorders with the highest mean, in line with the results obtained by Zare *et al.,*[20], who investigated the relationship between general health and sleep quality of workers with the number of accidents in the SirjanGolgohar industrial and mineral company, reporting social disorders with the highest mean (57.5%). The results of this current study revealed that the score of general health problems with the mean of 22.66±8.26 is of favorable status, with 61% of workers having no or minimal problems. These results are in accordance with the results obtained by Kaupan *et al.,*[27] in Thailand exploring the status of health and healthy behaviors in elderly workers employed in different industries, reporting the health status of workers as good with 59.3%. In the study by Gholami *et al.,*[26], the total mean score obtained for general health of workers was evaluated to be 27.45±7.84. They showed that 63.6% of workers had an unhealthy general health status, incongruent with this research. The difference in the results of these studies can be related to the difference in the type of working environment, job nature, special conditions of this industry, etc. moreover, research has shown that the individuals enjoy better socioeconomic and occupational conditions also better reflect their physical and mental symptoms. This problem has been reported especially for men[18]. It seems that this problem is also exemplified in this working society, and thus it deserves further attention. One of the reasons of the appropriacy of the general health score in the workers employed in the organic fertilizer production factory and the recycling management organization in Isfahan's municipality can be attributed to suitability of the status of anxiety and sleep problems in them. In this study, 77% of workers reported the lowest level of anxiety and sleep problems. Sufficient sleep hours can protect workers against exhaustion, anxiety, and depression. Note that the findings of this study that evaluated the level of workers' general health as good can be attributed to the fact that all samples are actively engaged in the mentioned factory. Further, during 1384, 1391, and 1394, the workers received vaccination against tetanus and hepatitis with the cooperation of Health Center Number 1 in Isfahan, with the new workers also being introduced to this center for vaccination.

The majority of the workers in the research were poor in terms of responsibility (52%), nutrition (53%), and physical activity (74%). However, in the dimensions of spiritual growth (67%), interpersonal relationships (72%), and stress management (54%), the highest frequency observed was related to the workers with a moderate level. Considering protective behaviors during work including wearing special work clothes, gloves, helmets, mask, and shoes specially designed for the job, the majority of workers (53%) were evaluated as good. The need of workers to use protective tools protects them against damage, disease, and even death, playing an important role in prevention from diseases caused by detrimental factors present in the environment and workers' health maintenance[28]. In general, considering health-promoting behaviors, 73% were moderate and only 4% were good. A total of 73% of the workers had moderate level of healthy behaviors, incongruent with the results of Kaupan *et al.,*[27]. In the study by Kaupan *et al.,* 48.9% and 47.6% of workers had moderate and good healthy behaviors, while in our research only 4% of workers had good health-promoting behaviors. In the study by Kaupan, spiritual growth, interpersonal relationships, and stress management were evaluated to be 63.6, 51.5, and 53.1%, respectively, suggesting an acceptable level and in line with our research. In the study by Kirag *et al.,*[29], done in Turkey with the aim of investigating the health-promoting behaviors and the associated factors among nurses at university hospitals, physical activity was evaluated to be very poor, while spiritual growth was the highest dimension, in accordance with our research. Further, the results by Kardag *et al.,*[30] on health-promoting behaviors in Turkish textile workers, the behaviors in Turkish workers were moderate, in line with our research. In the Kardag's study, physical activity and spiritual growth gained the lowest and highest scores, respectively, congruent with our research. Health-promoting behaviors should be enhanced in all workers especially the behaviors related to responsibility, nutrition, physical activity, etc., since they not only prevent from chronic diseases, but also reduce healthcare costs in the future. The low mean in the physical activity dimension can be due to full-time working during the day and sometimes

second job because of low income of workers and lacking enough time for entertainment and exercise during the week. Moreover, the low mean in the dimensions of responsibility and nutrition can be related to low educational level of the mentioned workers. Around 97% of samples had diploma or below, suggesting insufficient awareness and education about right behaviors. Development of healthy behaviors in workers can result in enhanced wellbeing and health, and in turn, elevated ability to promote their productivity and generativity[27].

The results of this research indicated that there is a significant relationship between health-promoting behaviors in the dimensions of nutrition, stress management, spiritual growth, interpersonal relationships, physicalactivity, and sum of health-promoting behaviors with general health problems in these workers ($p<0.05$). As the health-promoting behaviors were improved in these dimensions, the workers' health problems declined. The results of this research are in line with those of Mazhari Azad *et al.,*[31]. In their study, the relationship between general health and lifestyle of students at Islamic Azad University, Bandarabbas Branch was evaluated. They found that there was a significant relationship between physical activity, smoking, nutrition, following safety issues, stress management, and general health of students. These results revealed that workers should have plans, training, and supervision in stress management, responsibility, physical activity and nutrition so that mental stress and pressure caused by the job, etc. and its effect on health are prevented and the workers are immune to the risks caused by sedentary lifestyle and unhealthy nutrition.

A significant difference was observed between presence of physical diseases in the workers and general health problems ($p<0.05$). General health problems in the workers who had physical disease were significantly higher. So far, the relationship between general health problems and incidence of physical symptoms has not been well explained in the literature[18]. Furthermore, the obtained results indicated that there is a significant difference between the smoker and non-smoker workers ($p<0.05$), with the general health problems being significantly greater among smoker workers. Studies have shown that smoking has negative effects on mental and physical health of individuals, congruent with the results obtained by Mazhari Azad *et al.,*[31] together with Gholami *et al.,*[26].

In addition, it was found that there is a significant relationship between the level of education and health promoting behaviors in the workers, where the higher the level of education, the greater the health promoting behaviors in workers ($p<0.05$). This finding is in line with the study by BaghyaniMoghadam *et al.,*[23] along with Pouroukhshouri *et al.,*[32] and Neydal[33]. Health promoting behaviors are significantly greater among the workers who undergo periodic examinations. This result is in accordance with the study by Kolrouzi[21]. He found that the nurses who evaluated their health status had higher scores in the sixth dimensions of health promoting behaviors. These findings highlight the need to positive changes in health behaviors and in turn health education and promotion of general health in the society especially workers.

CONCLUSION

Based on the results of this study, it was found that general health of 61% of workers was favorable, influenced by physical diseases and smoking. Health promoting behaviors were evaluated to be moderate in 73% of workers, influenced by level of education and periodic examinations. Eventually, it was found that there is a relationship between health promoting behaviors with general health problems in workers, and healthy behaviors can be considered as predictors of general health levels in workers. Therefore, considering the determining role of health promoting behaviors in prevention from chronic diseases and costs, substantial attention to this issue is recommended. Thus, it is suggested that planning should be done to enhance healthy behaviors in their working and personal environment of workers by healthcare experts and managers. The grounds for conducting healthy behaviors should also be facilitated and attempts should be made to enhance the level of education in workers and decrease smoking in the society of workers.

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