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Brief Report

The association between mental health and quality of life: A cross-sectional study in a large sample of Isfahan Steal Company's employees

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Abstract

Introduction: Investigating the quality of life and its determinants provides a general prospective about the health status and contributes in health planning. The present study aimed at investigating the relationship between mental health and quality of life, adjusting for the impacts of potential confounders in Isfahan Steal Company's employees.

Materials and Methods: In a cross-sectional study in 2016, 3063 people of Isfahan Steal Company's employees were selected through multistage cluster sampling and investigated. Required Information were obtained by EQ-5D questionnaire for evaluating quality of life, GHQ-12 questionnaire for evaluating mental health, IPAQ Questionnaire for evaluating physical activity, job stress questionnaire for evaluating job stress and demographic characteristics of study participants. Latent class regression analysis with Mplus7 software was used for data analysis.

Results: Based on the results 95.4% of participants have normal mental health score. Two classes were identified with latent class analysis based on quality of life; class 1 (good quality of life: 79.7%) and class 2 (poor quality of life: 21.3%). People with good mental health status had higher quality of life (P<0.0001); in which the direct significant association was observed between mental health and quality of life in crude model. After adjusting for the impacts of potential confounding variables the observed association was remained statistically significant which indicating that being in normal mental health level increases 4.25 times odds of beings in high quality of life class.

Conclusion: The present study provided valuable information about quality of life in industrial employees. This research showed that mental health has a significant association with quality of life. So, through improving the lifestyle, quality of life and life satisfaction would be increased.

Keywords: Industrial employees, Mental health, Quality of life

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Introduction

The concept of quality of life (QoL) refers to the physical, mental, social and spiritual dimensions of a person's well-being (1). Evaluation QoL provides worth information on how persons realize their lives,afford with or overcome difficulties (health-related or not), and finally how they are able to stable and succeed despite difficulties (2).

Employees are one of the key success elements of an organization and also health is important in this population; hence, it is necessary that the QoL as an important indicator of health must be evaluated for all of the work force in the organization. Industrial

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employees are exposed to occupational risks due to several factor which create major effects under QoL (3). It is believed that various number of factors might influence the QoL that mental health is one of the important and influential factors in QoL (4).

According to the World Health Organization (WHO), mental health is a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (5)**.** The concept of mental health is an aspect of the general health and includes all methods and measures that are used to prevent people from becoming ill with mental disorders, treatment and rehabilitation, so mental health is useful for assessing the health of a community (6). Mental health refers to psycho-physiological and behavioral symptoms such as anxiety, depression, stress, psychological distress, and so on (7).

Psychologists believe that individual characteristics, psychological and environmental pressures, economic, social and family status, lack of achievement of life goals and lack of motivation, affect mental health. Therefore, mental health and quality of life have a relationship and mental health is one of the key determinants of quality of life, because problems affecting quality of life can cause problems in mental health, and also affect the quality of life (8).

Psychological disorders have a high prevalence rate, so that around 919 million people suffering from psychological disorders. At any time, about 19% of the adult population is afflicted with mental disorders (9). In Iran, the prevalence of mental disorders in 2001 was 17.1%, and in 2003, psychological disorders accounted for the second highest rate of illness after deliberate and unintended accidents and accounted for 16% of the total rate of illness was involved. In 2005, the rate of diseases related to behavioral and mental disorders was reported as 14%. The prevalence of mental disorders in 2011 is estimated to be 20.8%, so that the prevalence of psychological disorders in women 25.7% and 15.9% in men (10).

Previous studies showed that mental health was significantly related to almost all of the QoL aspects (11-13). Different factors affect mental health and, consequently, quality of life. Hence, pain, discomfort, anxiety and depression lead to reduced mental health and, consequently, reduced in quality of life (14-16).

Majority of previous studies on QoL have focused on patients (17,18), general populations (19) and specific occupational populations (20,21). Also, assessment the QoL in Iranian general population was less considered (22,23) and it has been rarely investigated among workers with special conditions (24,25) and comprehensive study was not conducted to investigate the QoL of industrial employees.

On the other hand, most of the previous studies on QoL have applied descriptive and simple statistical analyses and investigated the QoL as a single measure. In the current study, we used latent class regression (LCR) analysis to assess the QoL among a large sample of Iranian industrial employees. This method provides a comprehensive feature about the QoL of employees through classifying them based on objectively and simultaneously analyze the relationship between mental health and QoL in the presence of other confounder variables such as age, gender, education level, marital status, sleep duration, physical activity, body mass index, job stress, shift work and second job.

Materials and Methods

We did a cross-sectional study among 16,000 formal and contractual employees of Isfahan Steal Company (ISC). All employees with at least one year of work experience and agreement to participate were included in the current study. Participants who did not answer a large fraction of questions (more than 10% of the questionnaires' pages) were excluded from analysis. Multi-stage cluster along with stratified random sampling method was used to select participants based on the number of managerial departments and the number of employees who worked in each section. Because of the random nature of sampling as well as limited number of female employees, 260 volunteer females intentionally included in the study to have a sufficient sample size of females.

Sample size in the current epidemiological study, to determine accurate and reliable estimates of the prevalence of psychological problems in at least 0.05 of industrial employees, taking into account the type 1 error of 0.05 and sampling errors of 0.01 were determined and finally the volume The final sample consists of 3063 people (88% response rate).

Therefore, finally 3063 participants among 16000 Isfahan steal company's employees were entered in the statistical analysis. The study protocol was approved by medical research ethics committee of the Cardiovascular Research Institute (Research project number: 87115) and signed informed consent was obtained from all participants.

Research instrument

- *EuroQol-5D Questionnaire (EQ-5D):* EQ-5D is a standardized and generic measure of QoL that can be used both in healthy populations and different groups of illnesses. It contains two parts: a self-reported description and a self-rated evaluation. The self-reported description assesses five dimensions of health: mobility, self-care, usual activity, pain/discomfort and anxiety/depression. These dimensions are valued by respondents on a three-point scale (no problem, moderate problem, extreme problem), according to their own health on the day of the survey. The self-rated evaluation uses a visual analogue scale (VAS) in which respondents are asked to rate a state of ill health on a scale from 0 to 100, producing an EQ-5D index score (26). This questionnaire has a good validity and reliability. For example, Brazier J et al. have shown their reliability between 0.77 and 0.88 in their studies (27).

- *Mental Health Questionnaire (GHQ-12):* The GHQ-12 was used to assess mental health of study participants consists of 12 questions: focusing, being useful, enjoying life, confronting problems, depression, life satisfaction, worrying, decision making, constant pressure, overcoming problems, self-confidence and worthlessness. Every one of its 12 items regarding recent symptoms, feelings or behaviors is answered on a four-category Likert scale (too usual, in the usual range, less than usual and much less than usual). Categories 1 and 2 are given value 0, and categories 3 and 4 are given value 1. Values from 12 items are added together to get an overall score. The score of the questionnaire varies from zero (favorable condition) to 12 (unfavorable condition) and a probable psychiatric case is considered when the score is equal to or greater than 4 (28). Montazeri et al. reported the Cronbach's alpha coefficient of the questionnaire 0.87 (29).

- *Job stress Questionnaire:* The Effort-Reward Imbalance (ERI) questionnaire, developed by Siegrist, measures effort, reward and over-commitment, to determine whether ERI and over-commitment are present. The questionnaire consists of 23 questions, indicating an effort and reward imbalance, and has three scale of effort (6 questions), reward (11 questions), and over commitment (6 questions). ER<1 indicating an imbalance in favor of rewards and ER>1 indicating an imbalance in favor of effort (30). The reliability of this questionnaire was studied by Yadgarfer et al. and Cronbach's alpha for attempts, rewards and commitments was reported to be 0.61, 0.85 and 0.67 respectively (31).

In this research, the other determinates of QoL include age (year), gender (male/female), marital status (married/single), education (0-5 years/6-12 years/over 12 years), sleep duration (hours), physical activity (hour per week); physical activity was evaluated by the International Physical Activity Questionnaire (IPAQ), which included 11 questions. The reliability of this questionnaire was studied by Moghaddam et al. and reported the Cronbach's alpha coefficient of the questionnaire 0.7 and Spearman Brown correlation coefficient (0.9) showed good test retest reliability(32), BMI (kg/m), Job stress (imbalance effort-reward), shift work (daily/rotational) and second job (yes/no).

In this study, a latent class analysis (LCA) was used to empirically extract homogeneous latent classes of employees based on their responses to 5 health-related quality of questions. In the framework of this modeling approach we can also to evaluate the relationship between mental health and QoL using its regression component. Furthermore, to determine the number of latent classes, we evaluated model fit criteria including Akaike's information criterion (AIC), Baysian information criterion (BIC), the adjusted Bayesian information criterion (ABIC), and entropy.

Quantitative variables were expressed as mean ± standard deviation and qualitative variables as frequency (percentages). Quantitative variables were compared between QoL class using independent t-test and categorical variables using Chi-square test. Latent class analysis was done using Mplus7 and spss24 software.

Results

Table 1 presents descriptive findings for the study sample. Of 3063 Isfahan steal company's industrial employees participated in current study, the mean age was 36.74 years (SD=7.31), 91.5% were male, 90% were married and most of the employees (62.3%) educated between 6-12 years. Almost all of the employees (95.4%) have normal mental health score, mean sleep duration and physical activity were 7.11 hour (SD=1.17) and 7.33 hours per week (SD=3.65) respectively. Mean ERI as indicator of job stress was 0.67 that indicated an imbalance in favor of rewards. 54.9% of employees have rotational work and 90.7% of them don't have second job.

Table 1. Characteristics of industrial employees in Isfahan Steal Company

Variables	Mean±SD or frequency (percentage)
Age (year)	36.74 ± 7.31

Sex	
Male	2803 (91.5)
Female	260 (8.5)
Marital status	
Married	2758 (90)
Single	305 (10)
Education years	
0-5 year	255 (8.3)
6-12 year	1908 (62.3)
> 12 year	900 (29.4)
Mental health	0.61 ± 1.3
Normal	2921 (95.4)
Abnormal	140 (4.6)
Sleep duration (hour)	7.11 ± 1.17
Physical activity (hour per weak)	7.33 ± 3.65
BMI (kg / m)	25.6 ± 3.8
Job stress (ERI)	0.67 ± 0.22
Shift work	
Daily	1380 (45.1)
Rotational	1683 (54.9)
Second job	
Yes	285 (9.3)
No	2778 (90.7)

* Quantitative variables were expressed as mean ± standard deviation and qualitative variables as frequency (percentage)

We estimated a series of LCA models to determine the number of latent classes (2-5 latent classes) at the employees-level. All model fit criteria as well as interpretability of extracted classes strongly suggested the LCA model with two employee latent classes based on five dimensions of EQ-5D. Table 2 reports the 2-class solution of employees in terms of QoL, the largest class represents high QoL and comprises 79.7% of the study sample. As can be seen the employees included in class 1 were most likely to report no problem or less in self-care and usual activity, and most of them have no problem in mobility, pain/discomfort and anxiety/depression.

The class two comprises participants with low QoL, contains 20.3% of the study sample. Employees in this class were most likely to report moderate/sever problem or severe pain/discomfort and moderate anxiety/depression.

Table 2. Item-Response Probability for each EQ-5D Questions for two Class Model

Class size	**Class 1 79.7% high QoL**		**Class 2 20.3% low QoL**	
Indicator	No problem	Moderate / Severe	No problem	Moderate / Severe
Mobility	0.99	0.01	0.75	0.25
Self-care	1	0	0.99	0.01
Usual activity	1	0	0.95	0.05
Pain/Discomfort	1	0	0.03	0.97
Anxiety/Depression	0.88	0.12	0.56	0.44

After classifying of participants in terms of the QoL using LCA, a univariate analysis was done to compare characteristics of the industrial employees between classes (Table 3). The results showed that age, sex, mental health, sleep duration, physical activity, BMI and shift work were significantly different in the two classes. People in low QoL class more frequently female, abnormal mental health, daily work and significantly has higher age, less sleep duration, higher BMI, while higher physical activity. In more details, 80.5% of males, 81.2% of employees with normal mental health and 81.9% of rotational workers had high QoL. Also mean age in the high QoL class is lower (36.3 year), indicating with increasing in age the QoL is reduces. In the high QoL class, mean sleep duration (7.16 hour) is higher than low QoL class, therefor increasing sleep duration led to increasing the QoL. Increasing BMI reduces the QoL, because in the low QoL class, mean BMI is higher than high QoL class.

Table 3. Univariate association between characteristics of the industrial employees and QoL

Variables	**Class 1 (high QoL)***	**Class 2 (low QoL)***	**P****
Age (year)	36.3 ± 7.3	38.5 ± 7.2	< 0.0001
Sex			0.001
Male	2256 (80.5)	547 (19.5)	
Female	186 (71.5)	74 (28.5)	
Marital status			0.18
Married	2190 (79.4)	568 (20.6)	
Single	252 (82.6)	53 (17.4)	
Education years			0.19
0-5 year	214 (83.9)	41 (16.1)	
6-12 year	1519 (79.6)	389 (20.4)	
> 12 year	709 (78.8)	191 (21.2)	
Mental health			< 0.0001

Normal	2372 (81.2)	549 (18.8)	
Abnormal	69 (49.3)	71 (50.7)	
Sleep duration (hour)	7.16 ± 1.15	6.91 ± 1.22	< 0.0001
Physical activity (hour per weak)	7.22 ± 3.64	7.79 ± 3.66	0.001
BMI (kg / m)	25.46 ± 3.7	26.09 ± 4.11	0.001
Job stress (ERI)	0.66 ± 0.22	0.67 ± 0.24	0.46
Shift work			0.001
Daily	1064 (77.1)	316 (22.9)	
Rotational	1378 (81.9)	305 (18.1)	
Second job			0.7
Yes	231 (81.1)	54 (18.9)	
No	2211 (79.6)	567 (20.4)	

*Quantitative variables were expressed as mean ± standard deviation and qualitative variables as frequency (percentages).
**using t-test and Chi-square test.

Table 4 displays the results of the latent class regression (LCR) to determine the relationship between quality of life and mental health for employees' QoL class membership. In the crude model, only the relationship between mental health was examined and shows a positive and significant relationship. In the same way, the odds of beings in high QoL class for employees with normal mental health, were 4.445 times that employees with abnormal mental health; in other words, employees with normal mental health also had a higher quality of life.

In Model 1, in the presence of demographic variables (age, gender, marital status, and education level), there was a positive and significant relationship between mental health and high quality of life, in such a way, the odds of membership in high QoL class for employees with normal mental health, were 4.42 times that employees with abnormal mental health.

In model 2, the effect of total demographic and lifestyle variables was also adjusted, there was a positive and significant relationship between mental health and high quality of life, so that the odds of membership in high QoL class for employees with normal mental health, were 4.14 times that employees with abnormal mental health. In the last model, the effect of all the covariates, including demographic, lifestyle and job-related variables, was adjusted. There was a positive and significant relationship between mental health and high quality of life, in such a way, the odds of membership in high QoL class for employees with normal mental health, were 4.25 times than employees with abnormal mental health.

Among all covariates, only age, sex, sleep duration, physical activity, and BMI had a significant relationship with quality of life.

Table 4. Multivariable Odds ratio (OR) and 95% CI for OR of the association between mental health with high QoL class membership

	Determinants of QoL	*	% **	**P**
Crude model	Mental health	4.45	3.15-6.27	< 0.0001
Model 1[1]	Mental health	4.42	3.11-6.27	< 0.0001
	Age (year)	0.95	0.94 - 0.96	< 0.0001
	Sex			
	Male	1.6	1.2 – 2.2	0.002
	Female	1	-	-
	Marital status			
	Married	1.02	0.73 – 1.4	0.9
	Single			
	Education years			0.03
	0-5 year	1.8	1.2 – 2.7	
	6-12 year	0.99	0.71 – 1.2	
	> 12 year	1	-	
Model 2[2]	Mental health	4.23	2.92-6.11	< 0.0001
	Age (year)	0.96	0.94 - 0.97	< 0.0001
	Sex			
	Male	1.6	1.2 – 2.3	0.003
	Female	1	-	-
	Marital status			

[1]Relationship between mental health and high quality of life in the presence of demographic variables
[2]Relationship between mental health and high quality of life in the presence of demographic and life style variables

	Married	1.1	0.78 – 1.6	0.53
	Single			
	Education years			0.05
	0-5 year	1.5	1 – 2.3	
	6-12 year	0.9	0.7 – 1.1	
	> 12 year	1	-	
	Sleep duration (hour)	1.15	1.1 – 1.2	0.001
	Physical activity (hour per weak)	0.97	0.95 – 0.99	0.02
	BMI (kg / m)	0.97	0.95 – 0.99	0.03
Model 3[3]	Mental health	4.25	2.9-6.1	< 0.0001
	Age (year)	0.96	0.94 - 0.97	< 0.0001
	Sex			
	Male	1.6	1.1 – 2.2	0.006
	Female	1	-	-
	Marital status			
	Married	1.1	0.78 – 1.6	0.56
	Single			
	Education years			0.06
	0-5 year	1.5	0.98 – 2.3	
	6-12 year	0.86	0.68 – 1.1	
	> 12 year	1	-	
	Sleep duration (hour)	1.1	1.1 – 1.2	0.001
	Physical activity (hour per weak)	0.97	0.94 – 0.99	0.02
	BMI (kg / m)	0.97	0.95 – 0.99	0.03
	Job stress (ERI)	0.97	0.63 – 1.5	0.9
	Working shift			
	Daily	0.9	0.73– 1.1	0.2
	Rotational			
	Second job			
	Yes	1.1	0.8 – 1.5	0.9
	No			

*OR= odds ratio. **CI= confidence interval, the presented ORs shows the impacts of each variable for being in good QoL class, resulted from MLCR

[3]Relationship between mental health and high quality of life in the presence of demographic, life style and job-related variables

Discussion

Our study investigated the relationship between mental health and high QoL of a large sample of Iranian industrial employees and classified them based on QoL items. Our findings showed a high proportion of study participants had high QoL and by adjusting the effect of all covariates (demographic, lifestyle and job-related variables), there was a positive and significant relationship between mental health and high quality of life, so that employees with normal mental health also have high quality of life.

In recent years, interest in measuring QoL has increased to provide an additional and more accurate assessment of the health of individuals or populations, also the results may come from specific health interventions (33). QoL is usually determined by a complex interaction of sociocultural, psychological, environmental, and demographic factors (34).

Abnormal mental health (depression, anxiety, stress) causes negative feelings on person's life so influences the QoL, but positive aspects of mental health (feel calm, contented, relaxed, happiness) improve sociological aspects of a person and thus improve QoL (35). In accordance with the earlier studies, our results showed that the abnormal mental health is the most important factors for low QoL among the all studied QoL's determinants. Mathew et al. conducted a study on QoL among man workers and concluded that mental health has a significant impact on QoL (36).

It is important to recognize some strengths as well as potential limitations of the present study. The current study can be considered as one of the few studies over the world and the first comprehensive study to investigate the relationship between mental health and high QoL by adjusting the effect of demographic, life style and job-related determinants on QoL of among a large sample of industrial employees in Iran. We used an advanced statistical model, i.e., latent class regression. This advanced statistical method provides a comprehensive assessment of QoL through classifying employees and simultaneously analyzed the relationship between mental health and high QoL by adjusting the effect of wide varieties of determinants of QoL. However, our study had some limitations. This study was a cross sectional one that the causal inference could not be inferred from the significant associations. Also, the questionnaires were self-reported that may affect the validity of results.

Conclusion

In summary, our study provides pertinent and valuable information about measuring QoL and the relationship between mental health and high QoL among industrial employees in a developing country. Relatively high proportion of industrial employees reported high QoL. Our study signifies the important roles of mental health on QoL of industrial employees. So, these findings picture the pathways for improving QoL and finally increasing the efficiency and productivity of workforce through directing health policies appropriately.

References

1. Michalos AC. Social indicators research and health-related quality of life research. Connecting the quality of life theory to health, well-being and education. USA: Springer; 2017; 25-58.
2. Bowling A. Measuring health: A review of subjective health, well-being and quality of life measurement scales. Open University Press; 2017.
3. Rongen A, Robroek SJW, van Lenthe FJ, Burdorf A. Workplace health promotion: a meta-analysis of effectiveness. Am J Prev Med 2013; 44(4): 406-15.
4. Bridges K, Huxley P, Mohamad H, Oliver J. Quality of life and mental health services. USA: Routledge; 2005.
5. Kessler RC, Ustun TB. The WHO Mental Health Surveys. 1st ed. New York: Cambridge University; 2008.
6. Yousofi F, Mohamadkhani M. [Investigation of students' mental health at Kurdistan University of Medical Sciences and related with age, gender and their academic courses]. Journal of Faculty of Medicine of Mashhad University of Medical Sciences 2014; 56: 354-61. (Persian)
7. Dohrenwend BP, Shrout PE, Egri G, Mendelsohn FS. Nonspecific psychological distress and other dimensions of psychopathology: Measures for use in the general population. Arch Gen Psychiatry 1980; 37(11): 1229-36.
8. Diener E. Frequently Asked question (FAQ'S) about subjective well-being (Happiness and life satisfaction). A Prim reporters Newcom. [cited Oct 16 2005]. Available from: URL http//www. psychuivcedu/-ediener/fag html.
9. Organization WH. The world health report 2003: shaping the future. World Health Organization; 2003.
10. Damari B, Alikhani S, Riazi-Isfahani S, Hajebi A. Transition of mental health to a more responsible service in Iran. Iran J Psychiatry 2017; 12(1): 36.
11. Tzeng D-S, Chung W-C, Lin C-H, Yang C-Y. Effort-reward imbalance and quality of life of healthcare workers in military hospitals: a cross-sectional study. BMC Health Serv Res 2012; 12(1): 309.

12. Ginieri-Coccossis M, Triantafillou E, Tomaras V, Soldatos C, Mavreas V, Christodoulou G. Psychometric properties of WHOQOL-BREF in clinical and health Greek populations: incorporating new culture-relevant items. Psychiatr Psychiatr 2011; 23(2): 130-42.
13. Alexopoulos EC, Palatsidi V, Tigani X, Darviri C. Exploring stress levels, job satisfaction, and quality of life in a sample of police officers in Greece. Safe Health Work 2014; 5(4): 210-5.
14. Mailey EL, Mullen SP, Mojtahedi MC, Guest DD, Evans EM, Motl RW, et al. Unobserved mental health profiles are associated with weight and physical activity change in female college freshmen: A latent profile analysis. Ment Health Phys Act 2012; 5(1): 76-84.
15. Nazari S, Tojari F, Esmaeili MR. The relationship between mental health with job stress, quality of work life, and self-efficacy among referees. Int J Sport Stud 2014; 4(5): 531-9.
16. Liu X, Duan S, Wu Y, Ye C, Wang J, Dong H. Comparative study on health related quality of life of farmers and workers. Value Health 2014; 17(7): A755-6.
17. Artigas NR, Striebel VLW, Hilbig A, Rieder CR. Evaluation of quality of life and psychological aspects of Parkinson's disease patients who participate in a support group. Dement Neuropsychol 2015; 9(3): 295-300.
18. Opoku-Boateng YN, Kretchy IA, Aryeetey GC, Dwomoh D, Decker S, Agyemang SA, et al. Economic cost and quality of life of family caregivers of schizophrenic patients attending psychiatric hospitals in Ghana. BMC Health Serv Res 2017; 17(Suppl 2): 697.
19. Koohi F, Nedjat S, Yaseri M, Cheraghi Z. Quality of Life among general populations of different countries in the past 10 years, with a focus on human development index: A systematic review and meta-analysis. Iran J Public Health 2017; 46(1): 12-22.
20. Cakmakci Karadogan D, Onal O, Say Sahin D, Yazici S, Kanbay Y. [Evaluation of school teachers' sociodemographic characteristics and quality of life according to their cigarette smoking status: a cross-sectional study from the eastern Black Sea region of Turkey]. Tuberk Toraks 2017; 65(1): 18-24. (Turkish)
21. Marconato RS, Monteiro MI. Pain, health perception and sleep: impact on the quality of life of firefighters/rescue professionals. Rev Lat Am Enfermagem 2015; 23(6): 991-9.
22. Hajian-Tilaki K, Heidari B, Hajian-Tilaki A. Health related quality of life and its socio-demographic determinants among Iranian elderly people: a population based cross-sectional study. J Caring Sci 2017; 6(1): 39-47.
23. Roustaei N, Jamali H, Jamali MR, Nourshargh P, Jamali J. The association between quality of sleep and health-related quality of life in military and non-military women in Tehran, Iran. Oman Med J 2017; 32(2): 130-4.
24. Kabir-Mokamelkhah E, Bahrami-Ahmadi A, Aghili N. Work-related stress and quality of life among Iranian blue-collar workers with self-reported low back pain. Med J Islam Repub Iran 2016; 30: 474.
25. Mohammadi H, Dehghan SF, Golbabaei F, Roshani S, Pakzad R, Foroughi P, et al. [Pulmonary functions and health-related quality of life among silica-exposed workers]. Tanaffos 2017; 16(1): 60-7. (Persian)
26. Theofilou P. Quality of life: definition and measurement. Eur J Psychol 2013; 9(1): 150-62.
27. Brazier J, Jones N, Kind P. Testing the validity of the Euroqol and comparing it with the SF-36 health survey questionnaire. Qual Life Res 1993; 2(3): 169-80.
28. Goldberg DP, Williams P. A user's guide to the General Health Questionnaire (GHQ). USA: Guppy and Marsden; 1988.
29. Montazeri A, Harirchi AM, Shariati M, Garmaroudi G, Ebadi M, Fateh A. The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version. Health Qual Life Outcomes 2003; 1(1): 66.
30. Siegrist J, Li J, Montano D. Psychometric properties of the effort-reward imbalance questionnaire. Department of Medical Sociology, Faculty of Medicine, Duesseldorf University, Germany; 2014.
31. Yadegarfar GH, Alinia T, Hassannezhad R, Fayaz M, Hosseini R, Sanati J, et al. Validation and localization of Farsi version of Effort-Reward Imbalance Questionnaire to measure job stress among employees of Isfahan Polyacryle Corporation. Iran J Epidemiol 2012; 8(3): 73-83.
32. Moghaddam MHB, Aghdam FB, Jafarabadi MA, Allahverdipour H, Nikookheslat SD, Safarpour S. The Iranian version of International Physical Activity Questionnaire (IPAQ) in Iran: content and construct validity, factor structure, internal consistency and stability. World Appl Sci 2012; 18(8): 1073-80.
33. Basu D. Quality-of-life issues in mental health care: Past, present, and future. Ger J Psychiatry 2004; 7(3): 35-43.
34. Massam BH. Quality of life: public planning and private living. Prog Plann 2002; 58(3): 141-227.
35. Connell J, O'Cathain A, Brazier J. Measuring quality of life in mental health: are we asking the right questions? Soc Sci Med 2014; 120: 12-20.
36. Mathew G, Ramesh N, Shanbhag D, Goud R, Subramanian S, Lobo C, et al. Quality of life and probable psychological distress among male workers at a construction site, Kolar district, Karnataka, India. Indian J Occup Environ Med 2016; 20(1): 54-9.