## Research

# Quality of life assessment in pre-hospital and hospital emergency healthcare workers: A pilot study

Mehdi Nasr Isfahani MD, is an emergency medicine specialist[1]; Mohammad Hadi Hatami MSc, is a psychologist[2]; Donya Sheibani Tehrani MSc, is a research coordinator[2]

**Affiliation:**
[1]Department of Emergency Medicine, Isfahan University of Medical Sciences, Iran.
[2]Al-Zahra University Hospital, Isfahan University of Medical Sciences, Iran

## Abstract

**Introduction**
Quality of life (QoL) is an important index of general and mental health. Several studies have demonstrated healthcare staff can provide higher quality services to patients when they have a better QoL. Working in emergency care services has a heavy workload therefore poor QoL can lead to poor quality of service to patients. We aimed to assess the QoL in pre-hospital and hospital emergency healthcare workers in Isfahan province in Iran via the WHOQOL-BREF (World Health Organization Quality of Life) questionnaire.

**Methods**
A total of 891 pre-hospital and hospital emergency personnel were selected via the census method. The WHOQOL-BREF questionnaire was filled out by the participants over a period of 1 year.

**Results**
A total of 891 subjects participated. About 33.7% of the participants were pre-hospital emergency staff, 59.1% emergency department nurses, 5.3% emergency department physicians, and 1.6% emergency medicine specialists. Approximately 412 participants (48.8%) were women and 469 (53.2%) were men (mean age 37.72 ± 11.02 years). QoL in pre-hospital and hospital emergency personnel had the highest mean score in the general health domain (61.43 ± 21.38) and the lowest mean score in the environmental health domain (48.54 ± 17.62). Social relationships with a mean score of 53.30 ± 23.56 were not significantly different to the average (p>0.05). Workplace and work experience had a significant effect on all domains of QoL.

**Conclusion**
Pre-hospital and hospital emergency personnel in Isfahan province had an optimal QoL, except in environmental health. Therefore, to increase the QoL in this area the periodical evaluation of environmental health is recommended. Appropriate training to create workplace adjustment and work experience can also improve QoL.

Corresponding Author: Mohammad Hadi Hatami, mh.hatami62@gmail.com

# Introduction

Human resources are the most basic strategic resource in every organisation; and workplace success is strongly dependent on the optimal use of human resources based on behavioral sciences (1). Quality of life (QoL) measurement was first used in the United States after World War II to show that having a 'good life' has many different aspects (2).

QoL improvement is a comprehensive plan that increases job satisfaction, decreases burnout and helps staff to develop their occupational skills. The goal of most organisations is to increase the satisfaction of their staff in all areas, but it is difficult to determine which characteristics are related to QoL (3,4). In general, QoL is a multidimensional structure including physical, mental and social health – which studies have shown is important to health policy and management, and the efficacy of medical interventions (5).

The World Health Organization (WHO) defines QoL as "individuals' perceptions of their position in life, in the context of the culture and value systems, in which they live and in relation to their goals, expectations, standards, and concerns" (6). QoL, life satisfaction and feelings of happiness are indexes of general health and mental health. Better QoL leads to more physical, psychological and social satisfaction, which has a positive impact on work-life balance. Several studies have demonstrated healthcare staff can provide higher quality services to patients when they have better QoL (7-10).

Emergency departments (EDs) are among the most stressful of work environments due to heavy workloads, the critical nature of patient conditions, time limitations, decision-making in critical situations, and a lack of human and technical resources (11-13). Working in the ED or the pre-hospital emergency care service can therefore lead to poor QoL, which can in turn lead to poor quality services for patients (7,11,14).

The WHO Quality of Life questionnaire (WHOQOL-BREF) is a commonly used tool for assessing QoL by focussing on an individual's own views of their life satisfaction (6,7). In this study we aimed to assess the QoL in pre-hospital and hospital emergency healthcare workers in Isfahan province in Iran using the WHOQOL-BREF questionnaire.

# Methods

This was a cross-sectional correlational study carried out over a period of 1 year. Ethics approval was given by the Ethics Committee of Isfahan University of Medical Sciences( IR.MUI.REC.1395.2.155). The study population included physicians, nurses and technicians working in private and government hospital EDs and pre-hospital emergency units throughout Isfahan province, recruited and enrolled in the study, using the census method.

Inclusion criteria were willingness to participate in this study and more than 5 years of work experience in hospital or pre-hospital emergency service. Emergency personnel who did not want to participate or had less than 5 years of work experience were excluded. Written consent was obtained from all the participants before the study. A total of 891 pre-hospital and hospital emergency personnel agreed to participate.

Data were collected via the WHOQOL-BREF questionnaire, which has been translated into more than 40 languages (2,6,7). The Persian version of the WHOQOL-BREF questionnaire has been validated in Iran by Nedjat et al (15).

Participants first completed a general data questionnaire that included demographic data (age, gender, marital status, education, workplace, work experience). This was followed by the WHOQOL-BREF questionnaire, which participants filled out in their work departments or units.

The WHOQOL-BREF questionnaire has 26 items and includes two items of overall QoL and general health, and 24 items of satisfaction, divided into four domains: seven items from physical health (domain 1), six items from psychological health (domain 2), three items from social relationship (domain 3) and eight items from environmental health (domain 4) (Table 1). A total of 26 items are scored on a 5-point Likert scale. Each item is scored from 1 to 5 and items 3, 4 and 26 are scored conversely. Raw domain scores are calculated as follows:

- physical health domain: total score is 3, 4, 10, 15, 16, 17 and 18 with a score range of 7 to 35 with a difference of 28
- psychological health domain: total score is 5, 6, 7, 11, 19 and 26 with a score range from 6 to 30 with a difference of 24
- social relationship domain: total score is 20, 21 and 22 with a score range from 3 to 15 with a difference of 12
- environmental health domain: total score is 8, 9, 12, 13, 14, 23, 24 and 25 with a score range from 8 to 40 with a difference of 32
- general health domain: total score is 1 and 2 with a score range from 2 to 10 with a difference of 8.

Domains are scored positively (higher scores reveal higher QoL). The mean score of questions in each domain is used for the calculation of domain score then the scores are transformed to a 1 to 100 scale (6,7).

SPSS 21 (SPSS Inc. Chicago, IL, USA) was used for data collection and calculation at two levels of descriptive and inferential statistics. Descriptive analysis included frequency, percentage, mean and standard deviation (SD). Inferential analysis was performed, using the t-test and analysis of variance (ANOVA) test; p<0.05 was deemed statistically significant.

Table 1. The WHOQOL-BREF domains

| Domain | Features |
|---|---|
| Physical health | Activities of daily living<br>Dependence on medicinal substances and medical aids<br>Energy and fatigue<br>Mobility<br>Pain and discomfort<br>Sleep and rest<br>Work capacity |
| Psychological | Body image and appearance<br>Negative feelings<br>Positive feelings<br>Self-esteem<br>Spirituality/religion/personal beliefs<br>Thinking, learning, memory, concentration |
| Social relationships | Personal relationships<br>Social support<br>Sexual activity |
| Environment | Financial resources<br>Freedom, physical safety, security<br>Health and social care: accessibility and quality<br>Home environment<br>Opportunities for acquiring new information and skills<br>Participation in and opportunities for recreation/leisure activities<br>Physical environment (pollution/noise/traffic/climate)<br>Transport |

# Results

A total of 891 subjects participated in the study. About 33.7% of participants were pre-hospital emergency unit technicians, 59.1% were emergency department nurses, 5.3% were emergency department physicians and 1.6% were emergency medicine specialists. Approximately 412 participants (48.8%) were women and 469 (53.2%) were men with a mean age of 37.72 ± 11.02 years (Table 2).

QoL in pre-hospital and hospital emergency personnel had the highest mean score in general health (61.43 ± 21.38) and the lowest mean score in environmental health (48.54 ± 17.62). These results reveal that physical, psychological, environmental and general health were significantly higher than average in our participants, suggesting better QoL in these domains (p<0.05). Social relationships with a mean score of 53.30 ± 23.56 were not significantly different compared to the average (p>0.05). About 455 (52%) of emergency staff assessed social relationships less than the average, and 425 (48%) more than average (Table 3).

Table 3. Comparative assessment of QoL in emergency staff

| QoL | Mean ± SD | <=50 | >50 | p-value |
|---|---|---|---|---|
| Physical health | 55.05 ± 17.81 | 366(42) | 515 (58) | <0.0001 |
| Mental health | 55.13 ± 17.58 | 358(41) | 523 (59) | 0.001 |
| Social relationships | 53.30 ± 23.56 | 455(52) | 425 (48) | 0.328 |
| Environmental health | 48.54 ± 17.62 | 490(56) | 391 (44) | <0.0001 |
| General health | 61.43 ± 21.38 | 331(38) | 550 (62) | <0.0001 |

p<0.5 is considered significant

Table 2. Participant demographics

| Characteristic | Number | % | Characteristic | Number | % |
|---|---|---|---|---|---|
| Gender | | | Workplace | | |
| Female | 412 | 48.8% | Government centres | 824 | 93.5% |
| Male | 469 | 53.2% | Private centres | 56 | 6.4% |
| **Age (years)** | | | **Job category** | | |
| <30 | 321 | 36.4% | Pre-hospital emergency staff | 297 | 33.7% |
| 30-40 | 385 | 43.7% | Nurse | 521 | 59.1% |
| 40-50 | 136 | 15.4% | Physician | 47 | 5.3% |
| >50 | 22 | 2.5% | Emergency medicine specialist | 14 | 1.6% |
| **Work experience (years)** | | | **City climate** | | |
| <10 | 446 | 50.6% | Cold | 128 | 14.5 |
| 10-15 | 230 | 26.1% | Warm | 85 | 9.6 |
| 16-20 | 97 | 11.0% | Temperate | 66.8 | 75.8 |
| 21-25 | 60 | 6.8% | | | |
| 26-30 | 30 | 3.4% | | | |

Table 4 shows that workplace (government or private) and work experience had a significant effect on all domains of QoL (p<0.05), so that emergency personnel in private centres or with less work experience had higher QoL. Other factors such as gender, city of work and job category with influence co-efficients of 3.928, -2.467 and 2.480, respectively, were significantly effective on physical health (p<0.05). The job category had a significant and direct effect on psychological health (influence co-efficient = 1.945) and social relationships (influence co-efficient = 4.805) (p<0.05).

## Strengths and limitations

This study has a few strengths. First, it is the first pilot study to assess the QoL in emergency healthcare staff in Iran. Second, it recruited all emergency personnel including emergency medical services (EMS) and EDs. However, a few limitations cannot be ignored. Emergency physicians are usually very busy and have a heavy workload. Therefore, the results observed here may not reflect the overall situation due to a potentially selective sample, which possibly over or underestimated the effects. Second, we only investigated the QoL in emergency medical staff, using a pilot study. With the current study design it was not possible to include a range of other factors (eg. beyond gender, specialty, age) that could modulate QoL scores. Third, the data were collected through a self-reporting questionnaire, leaving the interpretation of the questions to the respondents. The use of a self-reporting questionnaire may have decreased the reliability of responses due to misinterpretation of some of the questions. Fourth, the role of the type of profession (eg. EMS personnel, ED nurses, emergency physicians, general practitioners) on coping strategies and QoL could not be addressed in this study and should be considered in future investigations.

## Discussion

Results of this study revealed that pre-hospital and hospital emergency staff in Isfahan had the highest QoL in the general health domain; the lowest was in the environmental health domain. Overall, their physical, psychological, environmental and general health were above the average, which can be interpreted as an optimal QoL. However, in the social relationship our results were not significantly different from the average. The study by Gholami et al demonstrated the highest QoL mean score in the physical health domain among the studied healthcare staff (in Iran) and the lowest QoL mean score in the environmental health domain (7). The study of Mazaheri et al also showed similar results (2,16). According to our results in the psychological health domain, the mean score of QoL was above the average but not significant (55.13 ± 17.58, p=0.001) compared to the results of Gholami et al (mean score of mental health of 60.6) (7). Gholami et al (7) reported the lowest mean score of QoL in the environmental health domain (56.94), which is similar to our findings (48.54 ± 17.62, p<0.00). Mazaheri et al (2) and Abdollahpour et al (16) also reported the lowest mean score of QoL in the environmental health domain, although their study population was different from ours.

Dissatisfaction with environmental health in healthcare staff, university students and government staff in our study (and the abovementioned studies, all carried out in Iran) reveal the critical problems in the environmental health domain, affecting both QoL and quality of work-life balance, especially for emergency care personnel. In the social relationship domain, no significant difference between the reported mean score and average mean score (53.30 ± 23.56, p=0.328) was seen in our study, but Gholami et al reported a high mean score of 63.48 (7).

In this study, significant influential factors on QoL in each domain

Table 4. Regression analysis of QoL in emergency staff

| QoL | Factor | β (95% CI) | SD | p-value |
|---|---|---|---|---|
| Physical health | City | -2.467 (-4.147_-0.788) | 0.856 | 0.004 |
|  | Workplace | 6.82 (1.622_12.022) | 2.649 | 0.010 |
|  | Work experience | -1.66 (-2.780_-0.551) | 0.568 | 0.003 |
|  | Gender | 3.928 (1.292_6.564) | 1.343 | 0.004 |
|  | Job category | 2.480 (0.429_4.531) | 1.045 | 0.018 |
| Psychological health | Workplace | 8.843 (3.743_13.943) | 2.598 | 0.001 |
|  | Work experience | -3.057 (-4.701_-1.412) | 0.838 | <0.001 |
|  | Job category | 1.945 (0.030_-3.860) | 0.976 | 0.047 |
| Social relationships | Work experience | -1.519 (-3.014_-0.025) | 0.761 | 0.046 |
|  | Gender | 5.631 (2.156_9.105) | 1.77 | 0.002 |
|  | Job category | 4.805 (2.128_7.482) | 1.364 | <0.001 |
| Environmental health | Workplace | 8.720 (3.649_13.790) | 2.583 | 0.001 |
|  | Work experience | -1.249 (-2.337_-0.162) | 0.554 | 0.024 |
| General health | Workplace | 9.292 (3.231_15.790) | 2.583 | 0.001 |
|  | Work experience | -1.249 (-3.893_-1.292) | 0.663 | <0.001 |

p<0.5 is considered significant

included: the city of work, workplace, work experience, gender and level of education in the physical health domain; workplace, work experience and level of education in the psychological health domain; work experience, gender and level of education in the social relationship domain; and workplace and work experience in the environmental health domain. Overall, workplace and work experience were the most significant influential factors in all four domains of QoL in our study. Our results showed that emergency staff in private health centres and with less work experience had higher QoL (17-19).

Abdollahpour et al reported level of education and current disease in government staff as the most influencing factors in the physical health domain; employment status in the psychological health domain; work experience and house ownership in the environmental health domain; and marital status in the social relationship domain (16). Gholami et al reported chronic disease in healthcare staff as the most significant factor, affecting QoL in the physical health domain; gender, level of education and chronic disease in the psychological health domain; and level of education and chronic disease in both social relationship and environmental health domains. They showed that chronic disease in healthcare staff is the most important factor affecting QoL in all four domains.

The study by Gholami et al reported a moderate QoL in healthcare staff in Neyshaboor (7). A pilot study of 64 ED nurses and physicians in Canada reported overall good quality of work-life balance (11). Our study showed an optimal QoL in both pre-hospital and hospital emergency care staff. Some differences in the results of our study compared with other studies are because of the different study populations, sampling methods (census method, which included the whole study population) and larger sample size.

We concluded that pre-hospital and hospital emergency personnel in Isfahan province have an optimal QoL, except for environmental health satisfaction. Low environmental health score has also been reported in other studies in Iran, both on healthcare staff and other populations, demonstrating critical problems in different environmental health aspects such as pollution, noise, traffic, climate, home environment and financial resources. To the best of our knowledge, our study is the first study with such a large sample size.

Among the four domains of QoL, the participants in this study had a relatively higher QoL in the general health domain and a lower QoL in the environmental domain. Our findings are nearly consistent with previous studies, which showed that the four domains of QoL and perceived general health are interrelated. Exposure to nature or green space has been found to improve people's health and wellbeing by providing restoration from stress and mental fatigue. In areas where 90% of the environment around the home was green, 5.3% fewer residents would feel unhealthy, compared with areas where only 10% of the environment was green. Detrimental social relationships

also play a role in physical and psychological health. An adverse family environment and lack of social support may result in depressive symptoms and subsequent psychological distress, which in turn would affect one's general health. To facilitate social interactions and networking, a neighborhood with a better-built environment, such as street connectivity, traffic and pedestrian safety, improved air quality and greenery are necessary (17,19,20).

Studies have shown that people tend to have better mental health if they are living in an environment which is less affected by noise and increasing temperatures, with better air quality, plenty of vegetation and open spaces, adequate social and entertainment facilities, and where they are safe to go out in the day and at night. Our study found that there were significant differences in levels of satisfaction with air quality, noise pollution, parks and gardens, recreation and sport facilities, and promenade across the nine districts. The availability and accessibility of open spaces and leisure facilities and the quality of air and noise conditions could play an important role in the overall levels of satisfaction with the environment (21).

The sole effect of overall satisfaction with the neighborhood environment on QoL in the psychological domain can be explained by its potential influence on sleeping quality, green exercise, social contact and cohesion. Green spaces help to filter pollution from the air and reduce air and ground temperature, which provide healthier sleep. People who do not sleep well usually have adverse moods and cognitive performance. Moreover, the increasing temperature has been associated with more aggressive behaviors, higher suicide rates and stress-related disorders. People who are living in a less crowded place or present in a more natural environment would have more opportunities to be involved in activities in green places. Green exercise significantly decreases stressful events, loneliness and depression. A neighborhood with a better-built environment such as walkability and street connectivity can improve people's mental health and wellbeing by increasing their social cohesion (18,21).

## Conclusion

The QoL of emergency workers in Isfahan province in Iran is satisfactory for the participants; however, there were some negative results in the environmental health domain. Future studies on a national scale and with a longitudinal approach are suggested. In clinical practice, some structural changes in the work pattern and possible interventions, such as psychological supports offered to ED staff, could be considered.

This study also provides policymakers and health administrators with evidence-based information on how physical and built environments can influence QoL. As the quality of work-life balance brings more commitment for employees, managers can improve the essential components of working life quality by adopting appropriate solutions and providing the necessary

conditions for improving the quality-of-service provision and productivity.

It is hoped that the findings from this study may be beneficial to health facility administrators in identifying their healthcare workers' level of satisfaction with work-life balance. Furthermore, these results may raise the awareness of researchers to conduct further interventional research studies, taking into consideration the training courses as an intervention to improve QoL.

This study showed that the lowest area of QoL was associated with environmental health; therefore, the periodical evaluation of environmental health is recommended. Appropriate training to create workplace adjustment and work experience can also improve QoL. We suggest improvement in all four domains of QoL for emergency care staff. For example, higher salaries, using more human and technical resources, providing regular training opportunities, more leisure activities and less environmental noise, traffic and pollution can all improve QoL in emergency care personnel, leading to improved work-life balance.

## Acknowledgements

## Competing interests

The authors declare no competing interests. Each author of this paper has completed the ICMJE conflict of interest statement.

## References

1. Hatami H, Mirjafari S, Mojahedi Jahromi S. Relationship between quality of work life and organizational commitment and productivity in Jahrom University of Medical Sciences. Journal of New Approach in Educational Administration 2011;2:25-40.
2. Mazaheri M. Overall, and specific life satisfaction domains: preliminary Iranian students norms. Iran J Public Health 2010;39:89.
3. Ghaffari G, Karimi A, Nozari H. The study of quality of life. Journal of Research in Social Studies and Research in Iran 2012;1:107-34.
4. Teles MAB, Barbosa MR, Vargas AMD, et al. Psychosocial work conditions and quality of life among primary health care employees: a cross sectional study. Health Qual Life Outcomes 2014;12:72.
5. d'Alessandro A, Niglio T, Desogus A, d'Alessandro A, Mandolesi D. New acoustic wave therapy improves quality of life in patients with multiple sclerosis and chronic cerebrospinal venous insufficiency. Ann Ital Chir 2015;86:336-9.
6. WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment. Geneva: World Health Organization; 1996.
7. Gholami A, Jahromi LM, Zarei E, Dehghan A. Application of WHOQOL-BREF in measuring quality of life in health-care staff. Int J Prev Med 2013;4:809.
8. Hooper C, Craig J, Janvrin DR, Wetsel MA, Reimels E. Compassion satisfaction, burnout, and compassion fatigue among emergency nurses compared with nurses in other selected inpatient specialties. J Emerg Nurs 2010;36:420-7.
9. Moghaddam Y. Comparative study of the quality of life of nurses working in the emergency department with other nurses. 2nd National Congress of Emergency Medicine 2007, Tehran Medical Emergency Medical Association.
10. Muindi F, K'Obonyo P. Quality of work life, personality, job satisfaction, competence and job performance: a critical review of literature. European Scientific Journal 2015;11:223-40.
11. Bragard I, Fleet R, Etienne A-M, et al. Quality of work life of rural emergency department nurses and physicians: a pilot study. BMC Res Notes 2015;8:116.
12. Motie M, Kalani M, Samadi A, Es-haghi H, Ghobadi P. Prevalence of job stressors in male pre-hospital emergency technicians. Journal of Fundamentals of Mental Health 2010;1:420-9.
13. Davari F, Isfahani MN, Rezvani M, Omidallah M, Pakravan F. Process management model in the emergency department of a university hospital: reduction of patient waiting times by changes in human resources. J Res Med Dent Sci 2018;6:578-85.
14. Isfahani MN, Davari F, Azizkhani R, Rezvani M. Decreased emergency department overcrowding by discharge lounge: a computer simulation study. Int J Prev Med 2020;11.
15. Nedjat S, Montazeri A, Holakouie Naieni K, Mohammad K, Majdzadeh S. The World Health Organization quality of Life (WHOQOL-BREF) questionnaire: translation and validation study of the Iranian version. Iran J Health Sch 2006;4:1-12.
16. Abdollahpour I, Salimi Y, Nedjat S, Jorjoran-Shoushtari Z. Quality of life and effective factors on it among governmental staff in Boukan city. Urmia J Med Sci 2011;22:40-7.
17. De Vries S, Van Dillen SM, Groenewegen PP, Spreeuwenberg P. Streetscape greenery and health: stress, social cohesion and physical activity as mediators. Soc Sci Med 2013;94:26-33.
18. Fuhrer R, Stansfeld SA, Chemali J, Shipley MJ. Gender, social relations and mental health: prospective findings from an occupational cohort (Whitehall II study). Soc Sci Med 1999;48:77-87.
19. Howell R, Kern M, Lyubomirsky S. Health benefits: meta-analytically determining the impact of well-being on objective health outcomes. Health Psychology Review 2007;1:83-136.
20. Rafieian A, Valikhany A, Alinaghian M. A mathematical model for efficient ambulance location based on DSM-MALP integration. J Emerg Manag 2020;18:153-62.
21. Kok BE, Coffey KA, Cohn MA, et al. How positive emotions build physical health: Perceived positive social connections account for the upward spiral between positive emotions and vagal tone. Psychol Sci 2013;24:1123-32.