Original Research

ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE AMONG NON-HEALTHCARE HOSPITAL WORKERS IN A TERTIARY CARE TEACHING HOSPITAL: A CROSS-SECTIONAL OBSERVATIONAL STUDY

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ABSTRACT

Background: Non-healthcare hospital workers, including security personnel, attenders, housekeeping staff, sweepers, and solid waste management workers, constitute an indispensable yet frequently neglected segment of the hospital workforce. Despite their critical role in sustaining hospital operations, their occupational health and quality of life (QoL) remain inadequately studied, particularly in resource-limited tertiary care settings.

Objectives: To assess health-related quality of life (HRQoL) among non-healthcare hospital workers using the EQ-5D-3L instrument and EQ Visual Analogue Scale (EQ-VAS), and to examine associations between HRQoL and sociodemographic variables including age, sex, income, and occupational category.

Materials and Methods: A cross-sectional observational study was conducted over four months in a tertiary care teaching hospital. A total of 128 non-healthcare workers were recruited using convenience sampling. HRQoL was assessed using the validated EQ-5D-3L questionnaire and EQ-VAS. Data were analyzed using IBM SPSS v26.0, employing descriptive statistics, independent samples t-test, Chi-square test, Kruskal–Wallis test, Mann–Whitney U test, and Spearman correlation.

Results: The mean EQ-VAS score was 73.6 ± 16.0. Pain/discomfort (53.9%) and anxiety/depression (30.5%) were the most prevalent impaired EQ-5D dimensions. Older age and lower income were significantly associated with poorer HRQoL ($p < 0.05$). Female participants reported a significantly higher prevalence of health-related problems compared to males (81.1% vs. 50.0%, $p = 0.006$).

Conclusion: Non-healthcare hospital workers carry a substantial burden of health-related impairment. Targeted occupational health interventions, ergonomic support, mental health services, and institutional welfare programs are urgently needed. This study contributes to the evidence base for policy-level attention toward this vulnerable workforce.

Keywords: Quality Of Life, EQ-5D-3L, EQ-VAS, Non-Healthcare Workers, Hospital Workers, Occupational Health, Tertiary Care Hospital.

INTRODUCTION

Quality of life (QoL) is a multidimensional construct encompassing physical, psychological, and social well-being. It reflects an individual's subjective perception of their position in life in the context of culture, value systems, personal goals, and expectations.[1]

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The World Health Organization defines QoL broadly as an individual's perception of their position in life within the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns.[2] Non-healthcare hospital workers — including attenders, security personnel, housekeeping staff, sweepers, and solid waste management workers — play a vital role in maintaining the smooth daily functioning of hospitals and healthcare institutions.[5] Although they contribute indirectly to patient care and hospital safety, their occupational health and well-being are frequently overlooked in healthcare research and policy planning. These workers are regularly exposed to prolonged working

hours, physically demanding duties, occupational hazards, inadequate protective equipment, low socioeconomic conditions, job insecurity, and limited psychosocial support.[5,6] Such adverse workplace conditions can significantly impair physical health, emotional stability, social functioning, and overall quality of life. In developing countries, particularly in tertiary healthcare institutions with high patient burden, this workforce experiences substantial occupational stress and limited access to welfare measures. [8,13]

The EQ-5D-3L is a standardized, validated instrument for measuring health-related quality of life (HRQoL) across five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. [9,10] It is widely recommended for use in occupational and population health research due to its brevity and cross-cultural applicability. [7,10] The EQ Visual Analogue Scale (EQ-VAS) complements this tool by capturing self-rated overall health on a 0–100 scale. Given the paucity of evidence on QoL among non-clinical hospital support staff in India, the present study aims to assess HRQoL among non-healthcare hospital workers in a tertiary care teaching hospital using the EQ-5D-3L and EQ-VAS, and to examine its associations with age, sex, income, and occupational role.

Objectives

Primary Objective

- To assess the association of age, sex, and income with health-related quality of life among non-healthcare hospital workers employed in a tertiary care teaching hospital using the EQ-5D-3L questionnaire and EQ-VAS.

Secondary Objectives

- To evaluate the prevalence of problems in the five EQ-5D-3L dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) among non-healthcare hospital workers.
- To determine the association between age and sex with quality of life scores among study participants.
- To assess the relationship between monthly family income and quality of life among the study participants.

MATERIALS AND METHODS

Study Design and Setting:

A cross-sectional observational study was conducted in a tertiary care teaching hospital over a study duration of four months. The study adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for reporting observational studies.[14]

Study Population

Non-healthcare hospital workers including security personnel, attenders, housekeeping staff, sweepers, and solid waste management workers employed in the institution constituted the study population.

Eligibility Criteria

Inclusion Criteria

- Non-healthcare hospital workers employed in the institution
- Participants willing to provide informed consent
- Age above 18 years

Exclusion Criteria

- Workers unwilling to participate
- Participants with incomplete questionnaire responses
- Seriously ill individuals during the period of data collection

Sample Size and Sampling Method

The sample size was calculated using the formula $n = Z^2pq/d^2$, where p = 20% (estimated prevalence of impaired quality of life), q = 80%, Z = 1.96 at 95% confidence interval, and d = 7% (permissible error). The calculated minimum sample size was approximately 125 participants. A total of 128 participants were enrolled in the study. Convenience sampling was employed due to the operational feasibility of recruiting workers available during duty hours within the limited study duration.[3]

Study Instruments

A structured socio-demographic questionnaire was administered to collect information on age, sex, occupation, and monthly family income. Health-related quality of life was assessed using the EQ-5D-3L questionnaire, which evaluates five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression.[9] Each dimension is rated on a three-level scale (1=no problem, 2=slight problem, 3=moderate/severe problem). The EQ-VAS records the respondent's self-rated health on a vertical visual analogue scale ranging from 0 (worst imaginable health) to 100 (best imaginable health).[10] Both instruments have been extensively validated across diverse cultural and occupational settings.[7,11]

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study. Informed written consent was obtained from all participants before data collection. Confidentiality and anonymity of participant information were maintained throughout the study. Participation was entirely voluntary, and participants were free to withdraw at any stage without consequences to their employment status. The study was conducted in accordance with the Declaration of Helsinki. [12]

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive

statistics included mean, standard deviation (SD), frequencies, and percentages. The independent samples t-test was used to compare continuous variables between two groups. The Chi-square test was applied to assess associations between categorical variables. The Kruskal–Wallis test and Mann–Whitney U test were used for non-parametric comparisons. Spearman rank-order correlation was computed to examine associations between EQ-5D dimension scores, EQ-VAS, and age. A two-tailed p-value < 0.05 was considered statistically significant.[15]

RESULTS

Sociodemographic Characteristics of Participants

A total of 128 non-healthcare workers employed in a tertiary care hospital were enrolled in this study. The mean age of participants was 42.8 ± 9.5 years (range: 27–75 years), with the majority (75.4%) falling in the 30–49 year age band. Among the 85 participants who reported their sex, 53 (62.4%) were female and 32 (37.6%) were male; sex data were missing for 43 respondents. Occupationally, security personnel (n=48, 37.5%) and attenders (n=43, 33.6%) constituted the two largest groups, followed by housekeeping staff (n=15, 11.7%), solid waste management workers (n=7, 5.5%), and sweepers (n=6, 4.7%). The mean monthly family income was INR 20,733 ± 7,470, with more than half (56.5%) earning between INR 10,001 and 20,000 per month. Detailed sociodemographic characteristics are presented in (Table-1).

EQ-5D-3L Dimension-Level Analysis

The distribution of responses across the five EQ-5D-3L dimensions is summarised in Table 2. Overall, 43 participants (33.6%) reported full health (health state 11111), indicating no problems across all five dimensions. Pain/Discomfort was the most frequently affected dimension, with **69** participants (53.9%) reporting at least some problem: 46 (35.9%) reported slight pain and 23 (18.0%) reported moderate pain. Anxiety/Depression was the second most prevalent domain of impairment, affecting 39 participants (30.5%) — 31 (24.2%) reporting slight and 8 (6.2%) reporting moderate anxiety or depression. Mobility was impaired in 32 participants (25.0%); 24 (18.8%) reported slight difficulty walking 500 metres, 7 (5.5%) moderate difficulty, and 1 (0.8%) severe difficulty. Problems with Usual Activities were reported by 24 participants (18.8%), and Self-care problems by 23 participants (18.0%). These two dimensions showed a similar burden, with the majority of affected individuals reporting only slight impairment.

EQ Visual Analogue Scale (EQ-VAS) Scores

The mean EQ-VAS score for the overall sample was **73.6 ± 16.0** (median: 70; range: 10–100; n=125). The distribution was left-skewed, with the modal response being 60. Self-rated health scores across sociodemographic subgroups are presented in (Table-3).

VAS by Sex

Males reported a marginally higher mean VAS score (75.9 ± 16.0) compared to females (68.9 ± 17.1). The difference did not reach statistical significance on independent samples t-test (t = 1.861, p = 0.066). This gender differential in self-rated health is consistent with findings reported in comparable occupational health studies. [6,8]

VAS by Age

A significant inverse relationship between age group and self-rated health was observed (Kruskal–Wallis H = 12.618, p = 0.013). Participants younger than 30 years reported the highest mean VAS (85.0 ± 15.2), which declined progressively to 61.4 ± 6.9 among those aged 60 years and above. Pearson correlation confirmed a significant negative association between age and VAS score (r = −0.304, p = 0.001), indicating that older workers perceived their health to be poorer. This finding corroborates earlier studies demonstrating age-related deterioration in HRQoL among occupational cohorts.[1,11,13]

VAS by Income

Monthly family income was significantly associated with self-rated health (Kruskal–Wallis H = 24.499, p < 0.001). A clear dose-response pattern was observed: mean VAS increased from 64.0 ± 16.7 in the lowest income group (≤INR 10,000) to 87.3 ± 16.2 in the highest (>INR 30,000). Post-hoc Mann–Whitney U tests revealed significant differences between the INR 10,001–20,000 and INR 20,001–30,000 groups (p < 0.001) and between INR 10,001–20,000 and >INR 30,000 groups (p = 0.001). No significant difference was found between the two higher income categories (p = 0.276), suggesting a threshold effect. These results align with the social determinants of health framework, wherein socioeconomic position is a key driver of health outcomes.[13,16]

VAS by Occupation

Sweepers reported the lowest mean VAS score (60.0 ± 8.9), while attenders reported the highest (77.5 ± 16.3). The overall difference across occupational groups was not statistically significant (Kruskal–Wallis H = 7.590, p = 0.108), possibly due to small subgroup sizes limiting statistical power.

Association between EQ-5D Dimensions, VAS, and Age

Spearman rank-order correlation coefficients were computed to examine the relationship between each EQ-5D dimension and the VAS score, and between each dimension and participant age (Table 4). All five dimensions showed significant negative correlations with VAS, confirming that greater impairment in any dimension was associated with lower self-rated health. The strongest correlation was observed for Pain/Discomfort (r = −0.537, p <

0.001), followed by Mobility ($r = -0.427$, $p < 0.001$), Self-care ($r = -0.415$, $p < 0.001$), Anxiety/Depression ($r = -0.372$, $p < 0.001$), and Usual Activities ($r = -0.283$, $p = 0.001$). Age was positively correlated with impairment scores in four of the five dimensions: Mobility ($r = 0.346$, $p < 0.001$), Pain/Discomfort ($r = 0.202$, $p = 0.023$), Anxiety/Depression ($r = 0.194$, $p = 0.029$), and Self-care ($r = 0.187$, $p = 0.036$). Usual Activities showed no significant association with age ($r = 0.084$, $p = 0.353$). Age itself demonstrated a significant negative correlation with VAS score ($r = -0.304$, $p = 0.001$), corroborating the dimension-level findings.

Prevalence of Any Health Problem by Sex

A significantly higher proportion of female participants (43/53, 81.1%) reported problems in at least one EQ-5D dimension compared to male participants (16/32, 50.0%) (Chi-square $\chi^2 = 7.701$, $df = 1$, $p = 0.006$). When individual dimensions were examined by sex, no statistically significant differences were found for Pain/Discomfort ($p = 0.206$) or Anxiety/Depression ($p = 0.071$), suggesting that the sex difference in overall problem prevalence was distributed across multiple domains rather than concentrated in a single dimension.

DISCUSSION

This cross-sectional study assessed HRQoL among 128 non-healthcare hospital workers using the EQ-5D-3L instrument and EQ-VAS in a tertiary care teaching hospital. The mean EQ-VAS score of 73.6 ± 16.0 indicates a moderately satisfactory perception of overall health; however, only one-third of participants (33.6%) reported a complete absence of problems across all five EQ-5D dimensions, underscoring a considerable burden of health-related impairment in this workforce. Pain/discomfort emerged as the most prevalent impaired domain (53.9%), consistent with findings from comparable studies among hospital support staff and frontline workers exposed to physically demanding occupational environments.[1,5,6] The high prevalence of musculoskeletal discomfort aligns with the nature of tasks performed by attenders, sweepers, and housekeeping staff, which involve prolonged standing, heavy lifting, repetitive movements, and exposure to biological and chemical hazards. Anxiety/depression as the second most affected domain (30.5%) reflects the psychosocial toll of low-wage, insecure employment with limited occupational recognition.[8,13]

The significant inverse relationship between age and self-rated health ($r = -0.304$, $p = 0.001$) is congruent with the literature on age-related decline in HRQoL among occupational cohorts.[1,11] Older workers in physically demanding roles face a compounding disadvantage of cumulative occupational exposure, reduced physiological reserve, and limited retraining or role transition opportunities. This finding has implications for workforce planning and phased retirement policies in tertiary healthcare institutions. The strong dose-response relationship between income and self-rated health ($H = 24.499$, $p < 0.001$) reinforces the well-established role of socioeconomic determinants in shaping health outcomes. [13,16] Workers earning below INR 20,000 per month reported substantially lower VAS scores, suggesting that financial insecurity contributes to health-damaging stress, reduced healthcare-seeking behaviour, and poorer nutrition. This finding is consistent with the social gradient in health as described in foundational public health literature.[16]

The finding that female workers were significantly more likely to report health problems (81.1% vs. 50.0%, $p = 0.006$) is consistent with earlier qualitative and quantitative research documenting the disproportionate occupational and domestic burden borne by female healthcare support staff.[8] The convergence of low wages, informal contractual arrangements, physically demanding roles, and household responsibilities creates a health disadvantage for female non-healthcare workers that warrants targeted institutional attention. Although occupational differences in EQ-VAS scores did not reach statistical significance, the trend toward lower scores among sweepers — who are exposed to the most hazardous waste and socially disadvantaged conditions — highlights the need for differentiated occupational health monitoring by job category. [5,6]

The correlation analysis confirming that impairment across all five EQ-5D dimensions is associated with lower VAS scores validates the construct validity of the EQ-5D-3L in this study population and underscores the multidimensional nature of health-related impairment. [9,10,11]

These findings collectively highlight the urgent need for comprehensive occupational health programmes targeting non-healthcare hospital workers. Evidence-based interventions should include ergonomic workplace redesign, regular health surveillance, access to mental health and psychosocial support services, fair remuneration policies, occupational safety training, and institutional welfare programmes. Such measures are not only ethically imperative but also likely to yield positive returns in terms of productivity, absenteeism, and service quality. [5,13,14]

CONCLUSION

The present study revealed that a substantial proportion of non-healthcare hospital workers experienced impairment in one or more domains of health-related quality of life. Pain/discomfort and anxiety/depression emerged as the most commonly affected dimensions, indicating that both physical strain and psychological stress contribute

significantly to reduced well-being among hospital support staff. Increasing age and lower income were significantly associated with poorer self-rated health, while female participants demonstrated a higher prevalence of health-related problems across EQ-5D dimensions. Although occupational category was not statistically associated with EQ-VAS scores, workers engaged in the most physically demanding and socially disadvantaged roles tended to report comparatively lower quality of life. These findings underscore the important influence of occupational and socioeconomic factors on the physical and psychological health of non-healthcare hospital employees. This workforce constitutes an essential component of the healthcare system, yet their health needs remain disproportionately overlooked.

The study emphasizes the necessity for comprehensive occupational health strategies encompassing ergonomic interventions, regular health screening, mental health counselling, stress management programmes, adequate remuneration, workplace safety measures, and employee welfare systems.[14] Strengthening institutional support for non-healthcare workers may not only improve their quality of life but also enhance workplace productivity, morale, and healthcare service delivery.

Future multicentric longitudinal studies with larger, representatively sampled populations are recommended to explore the long-term determinants of QoL among non-healthcare hospital workers and to evaluate the effectiveness of targeted occupational health interventions. Greater policy attention toward this vulnerable workforce is essential to ensure a healthier, safer, and more equitable hospital working environment. [5,16]

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Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study.

Informed Consent: Written informed consent was obtained from all participants.

Clinical Trial Registration: Not applicable. This is a cross-sectional observational study.

Data Availability: Data are available from the corresponding author upon reasonable request.

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Table-1: Sociodemographic Characteristics of Participants (N=128)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years) Mean ± SD: 42.8 ± 9.5 Range: 27–75	**<30**	**6**	**4.8**
	30–39	52	41.3
	40–49	43	34.1
	50–59	18	14.3
	≥60	7	5.6
	Missing	2	1.6
Sex	Female	53	62.4
	Male	32	37.6
	Missing	43	33.6
Occupation	Security	48	37.5
	Attender	43	33.6
	Housekeeping	15	11.7
	Solid Waste Mgmt.	7	5.5
	Sweeper	6	4.7
	Others	9	7.0
Monthly Family Income (INR) Mean ± SD: 20,733±7,470	**≤10,000**	**5**	**4.0**
	10,001–20,000	70	56.5
	20,001–30,000	34	27.4
	>30,000	11	8.9

(SD = Standard deviation; INR = Indian Rupees)

Table-2: Distribution of EQ-5D-3L Dimension Levels Among Participants (N=128)

Dimension	n	No Problem n (%)	Slight n (%)	Moderate n (%)	Severe n (%)
Mobility	128	96 (75.0%)	24 (18.8%)	7 (5.5%)	1 (0.8%)
Self-care	128	105 (82.0%)	22 (17.2%)	1 (0.8%)	—
Usual Activities	127*	103 (81.1%)	22 (17.3%)	2 (1.6%)	—
Pain/Discomfort	128	59 (46.1%)	46 (35.9%)	23 (18.0%)	—
Anxiety/Depression	128	89 (69.5%)	31 (24.2%)	8 (6.2%)	—

(* One missing response in the Usual Activities dimension)

Table-3: EQ-VAS Scores by Sociodemographic Characteristics

Variable	n	Mean VAS ± SD	Median	p-value
Overall (n=125)	**125**	**73.6 ± 16.0**	**70.0**	**—**
Sex (Independent samples t-test)				
Male	32	75.9 ± 16.0	75.0	0.066
Female	52	68.9 ± 17.1	65.0	
Age Group (Kruskal-Wallis test)				
<30 years	6	85.0 ± 15.2	90.0	0.013*
30–39 years	51	75.8 ± 17.2	80.0	

40–49 years	41	73.9 ± 15.8	70.0	
50–59 years	18	67.8 ± 11.0	70.0	
≥60 years	7	61.4 ± 6.9	60.0	
Monthly Income (Kruskal-Wallis test)				
≤10,000	5	64.0 ± 16.7	60.0	<0.001**
10,001–20,000	70	68.3 ± 14.3	70.0	
20,001–30,000	34	81.3 ± 14.6	80.0	
>30,000	11	87.3 ± 16.2	90.0	
Occupation (Kruskal-Wallis test)				
Security	48	72.0 ± 13.2	70.0	0.108
Attender	40	77.5 ± 16.3	80.0	
Housekeeping	15	72.7 ± 26.0	70.0	
Solid Waste Mgmt.	7	74.3 ± 11.3	75.0	
Sweeper	6	60.0 ± 8.9	60.0	

(SD = Standard deviation; * $p < 0.05$; ** $p < 0.01$)

Table-4: Spearman Correlation Coefficients between EQ-5D Dimensions, EQ-VAS, and Age

EQ-5D Dimension	r (VAS)	p-value	r (Age)	p-value
Mobility	−0.427	<0.001**	0.346	<0.001**
Self-care	−0.415	<0.001**	0.187	0.036*
Usual Activities	−0.283	0.001**	0.084	0.353
Pain/Discomfort	−0.537	<0.001**	0.202	0.023*
Anxiety/Depression	−0.372	<0.001**	0.194	0.029*
Age (years)	−0.304	0.001**	—	—

(r = Spearman's rho; * $p < 0.05$; ** $p < 0.01$. Higher dimension scores indicate greater impairment (1=no problem, 2=slight, 3=moderate/severe))