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**Original Research Article**

# Health related quality of life and its associated factors in an urbanised village of Delhi

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## ABSTRACT

**Background:** Health-related quality of life (HRQoL) is an important indicator of overall well-being that reflects the physical, mental, and social functioning of individuals. Rapid urbanization in India has resulted in the emergence of urbanized villages characterized by mixed socioeconomic conditions, environmental stressors, and changing lifestyle patterns, which may adversely influence HRQoL. This study aimed to assess HRQoL and its associated factors among adults in an urbanized village of Delhi.
**Methods:** A community-based cross-sectional study was conducted during November-December 2025 among 362 adults aged ≥18 years residing in Aliganj, an urbanized village in Delhi. Participants were selected using systematic random sampling. Short form (SF-12) was computed using standard scoring procedures. Data were analysed using SPSS version 31. Independent sample t-test was applied to assess associations between HRQoL scores and sociodemographic variables, with $p<0.05$ considered statistically significant.
**Results:** Overall, 59.4% of participants had good physical HRQoL (PCS), whereas only 43.1% demonstrated good mental HRQoL (MCS). The highest mean domain score was observed for Role Emotional (4.45±0.97), while physical functioning had the lowest mean score (2.53±0.61). Mental HRQoL was significantly associated with age ($p=0.006$), sex ($p=0.027$), physical activity ($p=0.020$), socioeconomic status ($p=0.025$), and marital status ($p=0.018$).
**Conclusions:** HRQoL among adults in the urbanised village was suboptimal, with mental health being more adversely affected than physical health. Targeted community-based interventions focusing on mental health promotion, physical activity, and socioeconomic support are essential to improve overall quality of life.

**Keywords:** Community-based study, Delhi, Health-related quality of life, Mental health, Physical health, SF-12, Urbanized village

## INTRODUCTION

Health-related quality of life (HRQoL) is a multidimensional concept that reflects an individual's perceived physical, mental, and social well-being in the context of their daily life and health status.[1] Beyond traditional morbidity and mortality indicators, HRQoL captures how people live with their health conditions, how they function in society, and how they perceive their overall well-being.[2] In recent years, HRQoL has emerged as an important outcome measure in public health research, particularly in settings undergoing rapid epidemiological and social transitions.

India is currently experiencing a complex phase of demographic and epidemiological change, marked by rapid urbanisation, population ageing, and a rising burden of non-communicable diseases (NCDs) such as

hypertension, diabetes, cardiovascular diseases, and mental health disorders. While urban populations are often assumed to have better access to healthcare and resources, urban living is also associated with new health risks, including sedentary lifestyles, psychosocial stress, environmental pollution, overcrowding, and socioeconomic inequalities.[3] These factors may significantly influence perceived quality of life, even in the absence of overt disease.

Within this broader urban context, urbanised villages represent a unique and under-studied population group. These settlements, originally rural in character, have been rapidly absorbed into expanding metropolitan regions like Delhi, leading to mixed patterns of traditional lifestyles and urban infrastructure. Residents of urbanised villages often experience fragmented social support systems, informal employment, variable access to healthcare services, and exposure to environmental stressors, while simultaneously lacking the social protections available to formal urban communities. Despite these distinct characteristics, empirical data on HRQoL among adults residing in urbanised villages remain scarce.

The 12-item short form health survey (SF-12) is a widely used, validated instrument for measuring HRQoL, generating summary scores for physical and mental health domains. Its reliability, and ease of administration make it particularly suitable for large-scale community-based surveys in resource-constrained settings.[4]

Urbanized village settings in across India have distinct social, environmental and health patterns, such as rapid urbanization, mixed housing, informal economies and pollution exposure. This further can impact on the health-related quality of the residents. Thus, this study aimed to estimate health related quality of life among adults in an urbanized village of Delhi.

## METHODS

### *Study design and settings*

The study is a community based cross-sectional study, conducted among adult residents in an urbanized village of Delhi. The study was conducted in November-December 2025.

### *Inclusion and exclusion criteria*

All adults who are aged 18 and above of urbanized village Aliganj, Delhi residing for a minimum of 6 months were included in the study. Critically ill patients were excluded from the study.

### *Sample size*

The sample size was calculated by using the formula: $Z^2pq/d^2$, where:

z=1.96 and CI=95%; n=minimum sample size; p=prevalence of low HRQoL (31%) (Chouhan et al); q=(1-p)=69%; d=absolute error (5%).[5]

$n=(1.96)^2\ pq/d^2=3.84(31)\ (69)/5^2=329$

The sample size came out to be 329, adding the 10% non-response rate, the sample size came out to be 362.

### *Sampling technique*

Systematic random sampling was employed to recruit the study participants. The total number of houses in the study area (Aliganj) was 2,848, and based on the required sample size, a sampling interval of 8 was calculated; hence, every 8th house was selected for inclusion in the study.

To determine the starting point, a bottle was spun at the central location of the urbanized village (Chaupal), and the first house in the direction indicated by the bottle was considered as the initial house. Thereafter, subsequent houses were selected at fixed intervals of eight houses. In case a multistoried building was encountered at the sampling interval, the specific floor to be surveyed was selected using the chit method.

From each selected household, only one eligible participant was enrolled in the study, and in situations where more than one eligible participant was present, the final participant was chosen using the chit method.

### *Data collection tool*

A pretested, semi-structured, validated interview schedule was used to collect data, which consists of the following sections: Section A: sociodemographic details consisting of age, gender, marital status, education status, religion etc. Section B: SF-12=12-item short form health survey.[4]

Health-related quality of life (HRQoL) in the present study was assessed using the short form-12 (SF-12) questionnaire, which is a widely used and validated tool for measuring overall physical and mental health. The SF-12 is a shorter version of the SF-36 and is especially useful in community-based studies as it captures key aspects of quality of life while remaining easy and quick for participants to complete.

The SF-12 assesses eight health domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. Together, these domains provide a broad picture of how individuals perceive their physical and mental well-being. Physical functioning and role physical reflect how physical health affects daily activities, while bodily pain and general health indicate the level of discomfort and overall health perception. Vitality measures energy and fatigue levels, social functioning reflects the impact of health on social life, role emotional captures the effect

of emotional problems on routine activities, and mental health assesses psychological well-being and distress.

These eight domains are combined to generate two summary scores: the physical component score (PCS) and the mental component score (MCS). PCS mainly represents physical health status, while MCS reflects mental and emotional well-being.

Scores were calculated using standard SF-12 scoring procedures and were further transformed into norm-based scores with a mean of 50 and a standard deviation of 10 to allow easier interpretation. Higher PCS and MCS scores indicate better perceived physical and mental quality of life, respectively.

### *Statistical analysis*

The collected data were entered into Microsoft Excel and were cleaned for errors and missing values. Data analysis was carried out using licensed SPSS software version 31.0, and the results were presented in the form of tables and appropriate diagrams. Qualitative variables were expressed as frequencies and percentages, while quantitative variables were expressed as mean and standard deviation. Independent sample t-test was used to assess the association between quantitative outcome variables and categorical independent variables wherever applicable. A p value of less than 0.05 was considered statistically significant.

## RESULTS

Among the 362 study participants, 89 (24.5%) belonged to the 18-29 years age group, followed by those aged 30-39 years (22.3%). Females constituted 186 (51.4%) of the participants. The majority of participants were Hindu (352; 97.2%), and most participants were married (298; 82.3%).

**Table 1: Distribution of study participants based on the dimensions of SF-12 (n=362).**

| Variables | Mean | SD |
|---|---|---|
| **General health (GH)** | 3.52 | 1.03 |
| **Physical functioning (PF)** | 2.53 | 0.61 |
| **Role physical (RP)** | 3.88 | 1.3 |
| **Role emotional (RE)** | 4.45 | 0.97 |
| **Bodily pain (BP)** | 4.19 | 1.06 |
| **Vitality (VT)** | 3.9 | 1.14 |
| **Mental health (MH)** | 4.15 | 0.89 |
| **Social functioning (SF)** | 4.27 | 1.1 |

With respect to educational status, the highest level of education attained was high school in 104 (28.7%) participants, followed by illiteracy in 66 (18.2%). Regarding health scheme coverage, 131 (36.2%) participants reported being covered under a health scheme. In terms of physical activity, 273 (75.4%) participants reported meeting the recommended levels (≥30 minutes/day or ≥150 minutes/week). The majority of participants were vegetarian (251, 69.3%).

The highest mean score was observed for the role emotional (RE) domain (4.45±0.97), followed by bodily pain (BP) (4.19±1.06) and mental health (MH) (4.15±0.89). The lowest mean score was seen in the physical functioning (PF) domain (2.53±0.61). The general health (GH) and vitality (VT) domains showed mean scores of 3.52±1.03 and 3.90±1.14, respectively. The role physical (RP) domain had a mean score of 3.88±1.30. The social functioning (SF) domain had a mean score of 4.27±1.1 (Table 1).

A majority of participants reported good (above mean) scores across most domains of quality of life. The highest proportion of participants with good scores was observed in the role emotional (RE) domain, with almost three quarters (268, 74.0%) of respondents scoring above the mean. This was followed by the vitality (VT) domain, where 68.5% of participants reported good scores. Social functioning (SF) also demonstrated a favorable distribution, with 61.9% of participants having good scores.

With regard to physical health domains, physical functioning (PF) showed that more than half (204, 56.4%) of participants had good scores, while role physical (RP) and bodily pain (BP) revealed that 52.8% and 55.5% of participants, respectively, reported above-mean scores.

In contrast, general health (GH) exhibited the lowest proportion of participants with good scores, with only 47.5% scoring above the mean and a greater proportion (52.5%) falling below the mean. For, mental health (MH) scores more than half (210, 58.0%) of participants reporting good scores and 42.0% reporting poor scores (Table 2).

A higher proportion of participants demonstrated good physical health status, with 59.4% of respondents scoring above the mean for PCS, while 40.6% had poor PCS scores. In contrast, mental health outcomes showed an opposite trend, with only 43.1% of participants having good MCS scores and a majority, 56.9%, scoring below the mean (Table 2).

A statistically significant positive correlation was observed between age and the mental component score (MCS) (t=0.145, p=0.006), whereas no statistically significant correlation was found between age and the physical component score (PCS) (p=0.092). MCS was found to be significantly associated with sex (p=0.027), physical activity status (p=0.020), socioeconomic status (p=0.025), and marital status (p=0.018). In contrast, PCS was not significantly associated with any of the studied sociodemographic variables. Furthermore, religion, dietary pattern, and educational status did not show a

statistically significant association with either PCS or MCS (p>0.05).

**Table 2: Distribution of participants according to domain-wise HRQoL scores (n=362).**

| Domain | Category | Frequency | Percentage |
|---|---|---|---|
| **General health (GH)** | Good | 172 | 47.5 |
| | Poor | 190 | 52.5 |
| **Physical functioning (PF)** | Good | 204 | 56.4 |
| | Poor | 156 | 43.6 |
| **Role physical (RP)** | Good | 191 | 52.8 |
| | Poor | 171 | 47.2 |
| **Role emotional (RE)** | Good | 268 | 74.0 |
| | Poor | 94 | 26.0 |
| **Bodily pain (BP)** | Good | 201 | 55.5 |
| | Poor | 161 | 44.5 |
| **Vitality (VT)** | Good | 248 | 68.5 |
| | Poor | 114 | 31.5 |
| **Mental health (MH)** | Good | 210 | 58.0 |
| | Poor | 152 | 42.0 |
| **Social functioning (SF)** | Good | 224 | 61.9 |
| | Poor | 138 | 38.1 |
| **Physical component score (PCS)** | Good | 215 | 59.4 |
| | Poor | 147 | 40.6 |
| **Mental component score (MCS)** | Good | 156 | 43.1 |
| | Poor | 206 | 56.9 |

## DISCUSSION

The current study conducted among residents in an urbanized village in Delhi aims to assess their health-related quality of life using SF-12 questionnaire. The current study found that a higher proportion of participants demonstrated good physical health (59.4%) compared to mental health (43.1%). This finding is similar to the results of Pati et al, who observed that lower MCS scores than PCS scores.[6]

Regarding specific health domains, the current study observed the highest mean score in the role emotional (RE) domain (4.45±0.97), with 74% of participants scoring above the mean. This is similar to findings in urban Chengalpattu, which noted that while functional dependence affects well-being, many individuals maintain relatively higher scores in emotional and social well-being domains compared to physical ones.[7] Conversely, the current study found the lowest mean score in the physical functioning (PF) domain (2.53±0.61). This is similar to broader trends in India where physical limitations and musculoskeletal disorders are primary drivers of reduced functional status in adult populations.

A statistically significant positive correlation was observed in the current study between age and the mental component score (MCS) (p=0.006), suggesting that mental health perceptions improved as participants aged. But, Singh et al reported a steep decline in QoL scores with advancing age, particularly after 75 years.[8] Similarly, Ahamad et al and Sahoo et al found that increased age was a strong predictor of poorer HRQoL.[9,10] The possible reason for this discrepancy is that the current study included a younger adult population (starting at age 18) in an urbanized village, where nearly half of participants were under age 40. Further, only 15% of the study participants were elderly. This is in contrast to the comparison studies focused primarily on middle-aged and older adults (aged 45+ or 60+), where the cumulative burden of chronic diseases and cognitive decline naturally leads to lower scores.

The current study identified that MCS was significantly associated with sex (p=0.027). This is similar to findings by Ahamad et al and Singh et al, which concluded that the female population has a significantly higher likelihood of experiencing poor HRQoL and a higher burden of multimorbidity.[8,9] Furthermore, the current study found MCS significantly associated with physical activity (p=0.020). This is similar to the results of Sahoo et al and Rajan et al, which established that regular physical activity elevates mood, lowers stress, and is independently associated with higher utility and quality-of-life scores.[7,10]

Current study also found a statistically significant association between MCS and socioeconomic status. Nutakhor et al, also reported similar association between mental health and socioeconomic status.[11] Financial insecurity contributes to chronic stress, anxiety, and psychological distress by creating persistent economic strain and uncertainty. It also limits access to healthcare and social resources, thereby weakening coping mechanisms and ultimately leading to poorer mental health and reduced quality of life.

The present study also found an association between marital status and MCS, with married individuals reporting higher MCS. Verma et al also reported better mental health among married individuals as compared to unmarried.[12] This may be attributed to greater emotional support, social stability, and shared coping mechanisms within marriage, which can positively influence psychological well-being and overall mental quality of life.

Regarding educational status, the current study found no statistically significant association with either PCS or MCS. This is not similar to findings by Sahoo et al and Pati et al, who both determined that higher education was independently associated with better utility scores and better mental QoL.[6,10] A possible reason for this difference may be the unique environment of the urbanized village in Delhi. As noted in the sources,

residents in these settings face fragmented social support, informal employment, and environmental stressors like pollution, which may negate the protective effects education usually provides in more formal urban or rural settings.

The current study is strengthened by the use of the SF-12, a widely used and validated instrument suitable for measuring HRQoL in settings undergoing epidemiological transitions. The application of systematic random sampling ensures a structured recruitment process within the distinct urbanized village setting of Aliganj, Delhi. However, the study has several limitations. Its cross-sectional design prevents the establishment of causal relationships between sociodemographic factors and HRQoL. Additionally, because it focused on a single urbanized village, the findings may not be generalizable to the broader Indian population. Finally, unlike some of the comparison articles, this study did not specifically measure the duration or severity of chronic conditions, which are known to be significant predictors of diminished well-being.

## CONCLUSION

The present study revealed that health-related quality of life among residents of an urbanized village in Delhi is suboptimal, with mental health being more adversely affected than physical health. Less than half demonstrated satisfactory mental health, highlighting a critical area of concern. This suggests that mental well-being remains an under-addressed component of overall health in rapidly urbanizing communities.

The significant associations of mental health with age, sex, and physical activity indicate that targeted interventions are required, particularly for women, younger adults, and physically inactive individuals. Strengthening mental health services at the primary healthcare level through routine screening, counselling, and referral mechanisms can facilitate early detection and management of psychological distress. Community-based mental health promotion activities, including stress management programs and peer support initiatives, may help improve awareness, reduce stigma, and encourage timely care-seeking.

Furthermore, the strong link between physical activity and better mental health underscores the importance of lifestyle interventions. Promoting regular physical activity through community exercise programs, safe recreational spaces, and health education campaigns can contribute to improvements in both physical and mental components of HRQoL.

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