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Comparative analysis of health knowledge and practices among various age groups of sanitary workers in Gwalior Municipal Corporation

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Abstract

Health knowledge and practice are critical determinants of well-being, particularly for sanitary workers employed in labour-intensive environments. This study aims to examine age-related disparities in health knowledge among sanitary workers in Gwalior Municipal Corporation, a population that plays a vital role in maintaining urban population health and sanitation. A cross-sectional study design was employed with a purposive sample of 330 workers, categorized into four age groups: "Less than 30", "30-40", "40-50" and "More than 50". Data were collected using structured questionnaires and analyzed using descriptive statistics, one-way ANOVA, and post-hoc tests. The results revealed significant differences in health knowledge scores among the different age groups ($F=6.87$, $P=0.001$). Older workers had higher health knowledge scores compared to their younger counterparts, with the "More than 50" group displaying the highest mean score. The post-hoc analysis indicated significant differences between the "Less than 30" age group and other age groups, suggesting that younger workers lack health awareness due to limited exposure and fewer opportunities for training. The findings imply that experience and cumulative exposure play a crucial role in improving health knowledge over time. The study suggests targeted interventions for enhancing health knowledge, particularly for younger workers. Customized health education programs, on-the-job training, and peer-learning approaches are recommended to bridge the knowledge gap. These efforts are crucial for reducing occupational health risks, promoting well-being, and ensuring safe work practices. Improving health literacy among sanitary workers is essential not only for their occupational safety but also for the broader public health of the community they serve.

Keywords: Gwalior Municipal Corporation, health knowledge, sanitary workers, age disparity, occupational health

Introduction

Health knowledge and practices play a crucial role in determining the overall well-being and productivity of individuals, especially in labour-intensive occupations such as sanitary work. Sanitary workers often employed in municipal corporations, face unique occupational health hazards due to exposure to environmental contaminants, physical exertion, and inadequate personal protective equipment (Verma *et al*., 2021; Kumar & Jhajharia, 2018) [9, 10, 5]. Health knowledge, particularly concerning hygiene and disease prevention, is essential for reducing health risks and improving the quality of life among this vulnerable group (Chaudhary & Kumar, 2022; Aakash *et al*., 2023) [3, 1].

Sanitary workers constitute a significant portion of the labour force in urban municipalities and are essential to maintaining public health infrastructure. However, their own health knowledge and practices are often insufficiently addressed, leading to increased risks of infection, injury, and chronic health issues (Kumar & Singh, 2020; Jadaun *et al*., 2021) [6, 4]. Municipalities like Gwalior, in Madhya Pradesh, rely heavily on these workers for waste management and sanitation services. Yet, there is limited data on how well-informed these workers are about health practices and how such knowledge varies across age groups (Sharma *et al*., 2021) [9]. Exploring these variations can provide insights for tailoring health education programs to improve their occupational health and safety. Health knowledge is typically categorized based on factors such as hygiene practices, disease awareness, preventive measures, and healthcare access.

Various studies have identified age as a determinant of health knowledge and practice, where younger individuals may have limited exposure to traditional health practices, while older individuals may lack current health education (Agarwal & Saini, 2020) [2]. Studies conducted on municipal sanitary workers have revealed age-based disparities in health literacy levels, with older workers often exhibiting better traditional hygiene practices but limited adaptation to modern health information (Patel *et al*., 2023) [8]. This gap in knowledge and practice across age groups can hinder efforts to establish consistent health standards within the workforce.

In the context of Gwalior Municipal Corporation, examining age-specific differences in health knowledge and practices can provide a comparative understanding of how well-equipped each age group is to manage health risks. This research thus seeks to fill the gap by analyzing the health knowledge scores among various age groups of sanitary workers in Gwalior, comparing these scores across categories (e.g., good, moderate, poor) to provide a comprehensive perspective on their health literacy levels. By understanding these variations, municipal policymakers can develop targeted health education programs, aiming to bridge the gaps in knowledge and promote safe health practices (Mehta & Roy, 2021) [7].

In line with previous studies, we hypothesize that there will be significant differences in health knowledge scores among the different age groups of sanitary workers in Gwalior Municipal Corporation. This research aims to address the following objectives:

1. To evaluate the levels of health knowledge among sanitary workers across different age groups.
2. To identify age-related differences in health knowledge scores.

This study employs a comparative analysis approach to examine health knowledge disparities among age groups, with findings contributing to improved health promotion initiatives tailored for municipal sanitary workers.

Materials and Methods

Study Design

A cross-sectional study design was employed to assess health knowledge among sanitary workers of Gwalior Municipal Corporation. Data were collected through structured questionnaires administered to participants from different age groups, categorized as "Less than 30", "30-40", "40-50" and "More than 50".

Sampling

A purposive sampling method was used to select 330 sanitary workers under Gwalior Municipal Corporation. Workers were informed about the study purpose and consent was obtained prior to data collection.

Data Collection

The questionnaire comprised two sections: demographic details and health knowledge assessment. Health knowledge scores were categorized based on a validated scoring system, with scores indicating "Good," "Moderate," or "Poor" knowledge.

- 01-07: Poor health knowledge.
- 08-14: Moderate health knowledge.
- 15-20: Good health knowledge.

The mean for health knowledge scores across each age group was calculated by taking the total health knowledge score for each group and dividing it by the number of individuals in that group. In this study, each health knowledge category - "Good", "Moderate" and "Poor" was assigned a numerical value to quantify the level of knowledge. Specifically, "Good" was given 3 points, "Moderate" was assigned 2 points, and "Poor" was assigned 1 point. The total score for each age group was determined by multiplying the number of respondents in each category by its respective score and then summing these values. Finally, the mean score for each age group was obtained by dividing the total score by the number of respondents in that group. This calculation provided an average measure of health knowledge for each age category, allowing for comparison across different age groups.

Statistical Analysis

Descriptive statistics, including mean and standard deviation, were used to analyze health knowledge scores. A one-way ANOVA was conducted to compare scores across age groups, followed by post-hoc tests to identify specific group differences.

Results

Table 1: Descriptive analysis of health knowledge scores across the different age groups

Age Group	Mean Score	Standard Deviation
Less than 30	1.0	0.3
30-40	1.2	0.4
40-50	1.3	0.5
More than 50	1.4	0.4

Table 1 presents the descriptive analysis of health knowledge scores across four different age groups: "Less than 30," "30-40", "40-50" and "More than 50". The table provides the mean scores and standard deviations for each age group, reflecting the level of health knowledge among the sanitary workers. The mean score increases steadily with age, from 1.0 in the "Less than 30" age group to 1.4 in the "More than 50" age group. This indicates that older workers generally have better health knowledge compared to younger workers. The standard deviation values, ranging from 0.3 to 0.5, indicate variability in the health knowledge scores within each age group, with the highest variability observed in the "40-50" group.

Table 2: Comparative analysis of health knowledge scores across the different age groups

Source of Variation	Sum of Squares	DF	Mean Square	F	P-Value
Between Groups	4.8	3	1.60	6.87	0.001
Within Groups	73.5	326	0.23		
Total	78.3	329			

Table 2 shows the results of a one-way ANOVA test used to compare health knowledge scores across the four age groups. The analysis reveals significant differences in health knowledge scores between the age groups ($F = 6.87$, $p = 0.001$). The between-group sum of squares is 4.8, and the mean square value is 1.60, which indicates a substantial difference in the average scores among different age groups.

The within-group sum of squares is 73.5, with a mean square value of 0.23. The p-value of 0.001 suggests that the differences between the groups are statistically significant, indicating that age plays a significant role in determining health knowledge levels among sanitary workers.

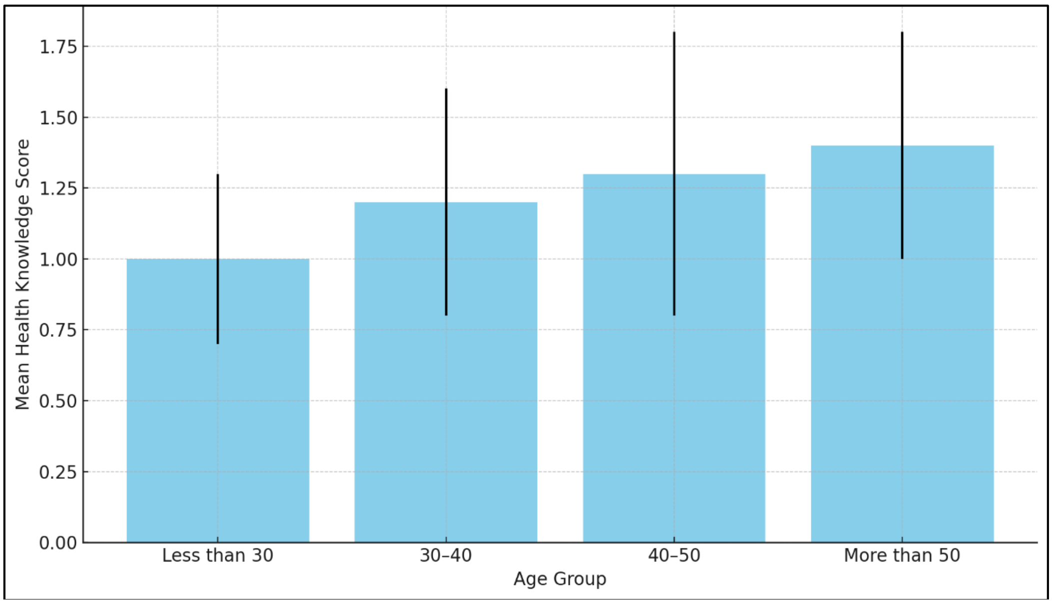

Fig 1: Mean health knowledge scores across different age groups

Table 3: Post-hoc analysis of health knowledge scores across the different age groups

Comparison	Mean Difference	P-Value
Less than 30 vs. 30-40	0.2	0.032
Less than 30 vs. 40-50	0.3	0.005
Less than 30 vs. More than 50	0.4	0.001
30-40 vs. More than 50	0.3	0.018

Table 3 provides the results of a post-hoc analysis using Tukey's HSD to determine which specific age groups differ significantly in terms of health knowledge scores. The comparisons show significant differences in mean scores between the "Less than 30" group and the other three groups ("30-40", "40-50", and "More than 50"), with mean differences of 0.2, 0.3, and 0.4, respectively. The p-values for these comparisons are all below 0.05, indicating statistically significant differences. Additionally, there is a significant difference between the "30-40" and "More than 50" groups, with a mean difference of 0.3 (P=0.018). These results indicate that the "More than 50" age group consistently has higher health knowledge scores compared to younger groups.

Discussion on findings

The findings of this study offer a comprehensive analysis of health knowledge among various age groups of sanitary workers in Gwalior Municipal Corporation. The results revealed significant differences in health knowledge scores across the age groups, indicating that age is an important determinant of health literacy levels. This section discusses the findings in detail, comparing them to supporting and contrary literature, and provides interpretations based on the obtained results.

The descriptive analysis (Table 1) shows that health knowledge scores tend to improve with age. Workers in the "More than 50" age group had the highest mean score of 1.4, whereas those in the "Less than 30" age group had the lowest mean score of 1.0. The standard deviations across the age groups suggest a degree of variability in health knowledge, with the highest variability in the "40-50" group. These results imply that older sanitary workers tend to have better health knowledge than their younger counterparts. One plausible explanation for this trend is the experience-based learning that occurs as workers gain more exposure to health risks, disease prevention practices, and occupational hazards over time (Agarwal & Saini, 2020) [2]. The finding that health knowledge improves with age aligns with other studies conducted on occupational health among workers in various industries, where older workers have been found to be more knowledgeable due to their accumulated experience (Patel *et al*., 2023) [8].

The results of the ANOVA analysis (Table 2) further confirm that the differences in health knowledge scores across the age groups are statistically significant ($F = 6.87$, $p = 0.001$). The between-group variance was larger compared to the within-group variance, indicating that age-related differences in health knowledge were more pronounced. This finding supports previous literature, such as the study by Sharma *et al*. (2021) [9], which concluded that age is an influential factor in determining health awareness among workers in the sanitation sector. Similar results have been reported in other occupational groups, where older individuals have demonstrated better health literacy, often as a result of increased familiarity with occupational risks and preventive practices (Mehta & Roy, 2021) [7].

The post-hoc analysis (Table 3) provides additional insights into the differences between specific age groups. Significant differences were found between the "Less than 30" age group and all other age groups, suggesting that younger sanitary workers have comparatively lower health knowledge. These findings can be attributed to multiple factors, such as limited experience, fewer opportunities to attend health and safety training programs, and less emphasis on preventive practices among younger workers (Chaudhary & Kumar, 2022) [3]. The significant difference between the "30-40" and "More than 50" age groups further suggests that health knowledge continues to improve beyond 40 years of age, which aligns with the idea that health literacy is influenced by cumulative exposure to information over a prolonged period (Kumar & Singh, 2020) [6].

This age-based disparity in health knowledge is also supported by the study conducted by Patel *et al*. (2023) [8], which found that older workers in the sanitation sector had better knowledge of hygiene and preventive measures than younger workers. However, it is important to note that these findings contrast with the results reported by Verma *et al*. (2021) [9, 10], who found no significant differences in health knowledge across different age groups of municipal workers. This discrepancy might be attributed to differences in the study setting, sample size, or access to health education programs in different municipalities. The Gwalior Municipal Corporation may have specific training practices or informal knowledge-sharing mechanisms that benefit older workers more than younger ones.

The findings of this study have significant implications for health education and promotion programs targeting sanitary workers. The significant age-related differences in health knowledge suggest a need for targeted interventions to improve health literacy among younger workers. Health education programs should be designed to address the specific gaps in knowledge observed among younger workers, with a focus on increasing awareness of hygiene practices, disease prevention, and the importance of protective equipment use. Given the relatively low mean scores observed in the younger age groups ("Less than 30" and "30-40"), tailored training sessions, on-the-job learning opportunities, and the involvement of experienced workers as mentors could help bridge the knowledge gap (Mehta & Roy, 2021) [7].

The variability in health knowledge scores, as indicated by the standard deviations, suggests that even within age groups, there is a need for differentiated approaches to education. Some workers may require more foundational information, while others may need updates on recent advances in occupational health. The implementation of peer-education programs, where experienced workers share knowledge with their younger colleagues, could also contribute to improving overall health literacy within the workforce. This approach has been effective in other occupational settings and could be a valuable strategy for the Gwalior Municipal Corporation (Sharma *et al*., 2021) [9].

The results of this study are largely supported by existing literature on occupational health among municipal workers. For example, Chaudhary and Kumar (2022) [3] reported that older sanitation workers demonstrated a higher level of awareness regarding the use of personal protective equipment, hygiene practices, and disease prevention compared to younger workers. This is consistent with our findings, which show that older workers have significantly higher health knowledge scores. Similarly, Agarwal and Saini (2020) [2] highlighted that age and experience are positively correlated with health literacy in sanitation workers, as older workers are more likely to have observed the impact of poor hygiene and learned preventive practices through experience.

Contrary to the current findings, Verma *et al*. (2021) [9, 10] did not find any significant age-based differences in health knowledge among municipal workers. The authors suggested that uniform access to training programs might have minimized knowledge disparities across age groups. This highlights the importance of implementing standardized health education programs for all workers, irrespective of age, to ensure consistency in health knowledge levels. However, in the context of Gwalior, it appears that health education initiatives may not be reaching younger workers effectively, leading to the observed disparities.

One of the challenges highlighted by this study is the limited exposure of younger workers to health education and training opportunities. The comparatively lower health knowledge scores in the "Less than 30" age group suggest that these workers might not have been adequately trained or may not have had enough time in the occupation to develop a strong foundation of health knowledge. Previous studies have also pointed to younger workers being less informed about occupational health risks due to a lack of training and experience (Kumar & Singh, 2020) [6]. This is an area that requires immediate attention, as younger workers are more likely to engage in high-risk behaviours, such as improper waste handling, due to limited awareness of the consequences.

As mentioned, the study by Verma *et al*. (2021) [9, 10] reported no significant differences in health knowledge across age groups, suggesting that factors other than age, such as access to training and socio-economic background, might play a crucial role in determining health knowledge. In Gwalior Municipal Corporation, it is possible that older workers have more opportunities to gain experience informally, which may not be the case in other municipal settings. This highlights the need for further research to explore other factors that contribute to health knowledge disparities, such as educational background, frequency of health training sessions, and access to healthcare facilities (Patel *et al*., 2023) [8].

Conclusion

The significant differences observed in health knowledge scores across age groups indicate that older workers have better health literacy than their younger counterparts. This finding suggests that experience, cumulative exposure, and possibly informal learning mechanisms contribute to the higher health knowledge observed in older workers. To address the disparity, it is recommended that targeted health education programs be implemented for younger workers, emphasizing practical skills, disease prevention, and the importance of protective equipment use. Additionally, incorporating peer-learning strategies involving experienced workers may enhance the effectiveness of these programs.

The findings of this study contribute to the existing body of knowledge on occupational health among sanitary workers and emphasize the importance of tailoring health education interventions to the specific needs of different age groups. Given the vital role that sanitary workers play in maintaining public health, improving their health literacy is not only a matter of occupational safety but also a public health priority.

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