

Original Article

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Health Related Quality of Life and Associated Factors among Solid Waste Pickers in Selected Areas of Dhaka City Corporation

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Abstract:

Background: Solid waste pickers play an essential role in recycling and waste recovery in Dhaka City, yet they remain marginalized, working under unsafe conditions. Our aim was to evaluate HRQoL and its determinants among solid waste pickers in Dhaka.

Methods: A cross-sectional study was conducted among 265 solid waste pickers from 11 Secondary Transfer Stations (STS) under Dhaka City Corporation using cluster sampling technique. Data were collected through semi-structured questionnaires incorporating the EQ-5D descriptive system and its Visual Analogue Scale (VAS). Health status was measured using UK-based weights, where higher scores indicated better health. To ensure consistency with the EQ-5D utility score, VAS values were rescaled to range from 0 to 1.

Results: The study revealed a very high prevalence of workplace injuries (98.5%). Among chronic conditions, asthma/COPD was most common (40.9%), followed by skin diseases (24.9%) and back pain (22.3%). Use of protective equipment was generally low. Despite these challenges, participants reported relatively high health-related quality of life, with a mean EQ-5D utility score of 0.839 (± 0.161) and a mean EQ-VAS score of 82.14 (± 16.41). However, substantial proportions reported pain/discomfort (81.1%) and anxiety/depression (45.7%), with statistically significant associations identified across gender, age, income, and work experience.

Conclusion: Solid waste pickers in Dhaka face serious occupational and health challenges that negatively impact their HRQoL, despite showing resilience in self-rated health. Improving their conditions requires urgent policy attention, including the provision of personal protective equipment, health education, access to healthcare, and formal recognition. Targeted occupational and social protection measures are essential to improve their HRQoL and urban sustainability in Dhaka.

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Introduction:

Solid waste comprises discarded materials such as food residues, paper, plastics, metals, and glass generated from residential, commercial, and industrial sources¹.

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Its volume depends on dietary habits, lifestyle, and industrialization, ranging from 0.25 to 2.5 kg per person daily worldwide². Inefficient waste disposal poses serious public health and environmental threats, fostering disease transmission, pollution, and reduced urban livability².

Solid Waste Management (SWM) encompasses the collection, transportation, recycling, and disposal of waste to minimize environmental and health impacts while promoting sustainable resource recovery³. Global waste generation is projected to rise from 2.1 billion tons in 2023 to 3.4 billion tons by 2050⁴. Although high-income countries generate 34% of global waste despite representing only 16% of the population⁵, low- and middle-income countries (LMICs) bear the heaviest burden of unmanaged waste. The global cost of waste mismanagement reached USD 361 billion in 2020 and may increase to USD 640.3 billion by 2050⁴.

In Bangladesh, rapid urbanization has intensified waste production, largely from households, food industries, and healthcare facilities⁶. Dhaka is the capital city of Bangladesh, and like many other capital cities, urbanization, along with its harmful effects, has occurred most rapidly in this city⁷. Bangladesh generates approximately 13,000 tons of waste daily, with Dhaka contributing around 4,000 tons, almost 70% of which is biodegradable and organic⁸. Only about 50% of Dhaka's waste is formally collected, while illegal dumping exacerbates health and environmental hazards⁹. Informal waste collectors, locally known as *Tokai*, play a pivotal role in recycling and recovering waste while working under hazardous and unregulated conditions¹⁰. They face occupational risks such as cuts, wounds, skin punctures, body aches, skin diseases, and toxic chemical and biological exposure, with women and elderly workers experiencing added vulnerabilities¹¹. Despite the essential role of solid waste pickers in urban sanitation, waste pickers remain excluded from formal policy frameworks. Few studies have explored their health-related quality of life (HRQoL), which reflects physical, mental, and social well-being. The EQ-5D-5L is widely recognized as a valid, reliable, and sensitive instrument for assessing Health-Related

Quality of Life (HRQoL) across various populations, including those with chronic, complex, or disadvantaged backgrounds¹².

This study aligns with the Sustainable Development Goals (SDGs), particularly SDG 1 (No Poverty), SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 11 (Sustainable Cities and Communities)¹³. Solid waste pickers in Dhaka contribute significantly to maintaining urban sanitation and environmental sustainability, yet their efforts remain largely unrecognized and stigmatized, and they are one of the most marginalized and health-compromised populations in the city¹⁰. Assessing their HRQoL and identifying its key determinants will provide critical evidence for formulating inclusive policies that promote health equity, decent work, and sustainable urban development.

Materials and Methods:

Study design and settings

A cross-sectional study was done to assess the level of health-related quality of life and associated factors among solid waste pickers in selected areas of the Dhaka City Corporation. The study was conducted across 11 Secondary Transfer Stations (STS) within Dhaka City Corporation, including Uttara, Shewrapara, Rampura, Meradia Bazar, Natun Bazar, Gulshan, Mohakhali, Bangla Motor, Paltan, Gulistan, and Demra. The total duration of the study was one year, commencing from 1st July 2024 to 30th June 2025.

Sample selection

A cluster sampling method was employed to select the study population. 265 waste pickers aged 18 years or older who have been actively working in Dhaka city for a minimum of 12 months.

Data collection procedure

The study participants were interviewed using a pretested semi-structured questionnaire through the face-to-face interview. The questionnaire included the following sections: respondents' personal information, socio-demographic characteristics, and personal habits, associated factors, behavioral factors, and the EQ-5D-5L health questionnaire.

Health-Related Quality of Life Assessment

The EQ-5D questionnaire, comprising a descriptive system and a Visual Analogue Scale (VAS), was used to assess Health-Related Quality of Life. The five EQ-5D dimensions mobility, self-care, usual activities, pain/discomfort, and anxiety/depression - each had five response levels, which were recoded into two categories: “no problem” (level 1) and “any problem” (levels 2–5). The VAS ranged from 0 (worst imaginable health) to 100 (best imaginable health), indicating participants' self-rated overall health status. An interviewer-administered approach ensured clarity and validity of responses. As no Bangladesh-specific value set exists, UK-derived preference weights were used to calculate EQ-5D index scores ranging from -0.59 to 1.0¹⁴.

Statistical analysis

Data were analyzed using IBM SPSS version 26. Respondents' age, income, family size, number of children, and work experience were categorized into defined groups. Descriptive statistics (frequency, percentage) summarized sociodemographic, physical, occupational, and behavioral variables, while chi-square and Fisher's exact tests assessed associations between HRQoL and respondent characteristics, with a significance level of 0.05.

Ethical approval

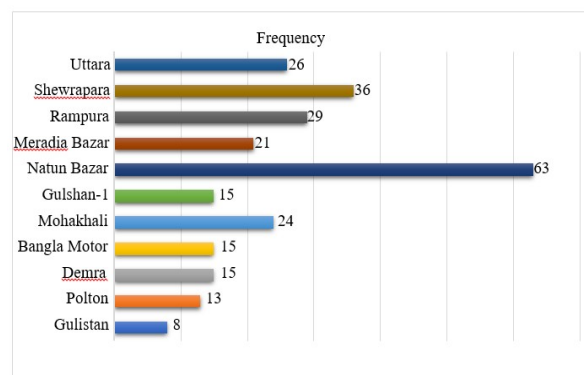
Informed written consent was obtained from each participant. Ethical approval was obtained from the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM), Dhaka 1212, Bangladesh. (NIPSOM/IRB/2025/32).

Result

The frequency distribution of the respondents shows cluster 07 as the largest segment (Figure I), comprising 63 individuals (23.8% of the total sample), suggesting a predominant pattern or characteristic within this subgroup. Cluster 10 follows the second most prevalent group, accounting for 13.6% (n = 36), while Cluster 09 and Cluster 11 represent 10.9% and 9.8% of the Participants, respectively. Clusters 05 and 08 account for 9.1% and 7.9%, respectively, indicating moderate representation. Clusters 03, 04, and 06 are equally sized, each encompassing 15

individuals (5.7%). Conversely, the smallest clusters are Cluster 01 and Cluster 02, with only 8 (3.0%) and 13 (4.9%) individuals, respectively.

Figure I: Distribution of respondents according to the place of data collection (n = 265)



As shown in Table 1, a total of 265 solid waste pickers were included in the study. The majority were aged 21–40 years (67.9%), followed by ≤20 years (16.6%) and 41–60 years (14.0%). Most respondents were male (98.1%) and Muslim (98.9%). More than three-quarters were married (77.7%). Most lived in households with more than four members (60.8%) and had two or fewer children (76.6%). Over half (53.6%) had 3–10 years of work experience. Monthly income was predominantly 10,001–15,000 BDT (49.4%), and 41.5% resided in tin shed houses. Although 30.9% reported dissatisfaction with living conditions, 65.7% were satisfied.

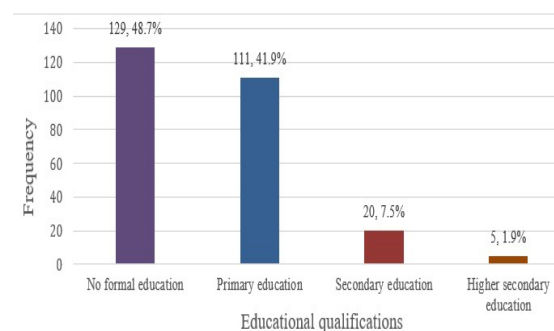
Table 1. Socio-Demographic Characteristics of Respondents (n = 265)

Characteristics	Categories	Frequency	Percentage (%)
Age group (years)	≤20	44	16.6
	21–40	180	67.9
	41–60	37	14.0
	≥61	4	1.5
Gender	Male	260	98.1
	Female	5	1.9
Religion	Muslim	260	98.1
	Hindu	3	1.1
Family members	≤4	104	39.2
	>4	161	60.8
Characteristics	Categories	Frequency	Percentage (%)

Marital status	Married	206	77.7
	Unmarried	57	21.5
	Widowed/Separated	1	0.4
	Higher Secondary	5	1.9
Number of children	≤2	203	76.6
	>2	62	23.4
Work experience (years)	<2	50	18.9
	3–10	142	53.6
	>11	73	27.5
Monthly income (BDT)	≤10000	41	15.5
	10001–15000	131	49.4
	15001–20000	72	27.2
	≥20000	21	7.9
House type	Tin shed	110	41.5
	Half building	85	32.1
	Concrete building	70	26.4
Satisfaction with living conditions	Very satisfied	9	3.4
	Satisfied	174	65.7
	Dissatisfied	82	30.9

Figure 2 shows that nearly half had no formal schooling (48.7%), while 41.9% had primary education. A smaller fraction (7.5%) had attained secondary level education, while only 1.9% had reached higher secondary education.

Figure 2: Distribution of respondent according to their educational qualification (n= 265)



According to Table 2, 16.6% of respondents reported having a chronic disease, with asthma/COPD being the most common condition (40.9% among those affected). Gastrointestinal disease (18.5%) and skin disease (24.9%) were also reported. Workplace injury was highly prevalent

(98.5%). Only 7.9% were receiving current medical treatment. Behavioural risk factors included current smoking (75.1%), betel nut chewing (27.2%), alcohol consumption (10.2%), and substance abuse (10.2%). Vaccination coverage was high for tetanus (82.3%) and COVID-19 (67.9%) but very low for hepatitis B (1.1%).

Table 2. Health, Occupational, and Behavioral Characteristics (n = 265)

Characteristics	Categories	Frequency	Percentage (%)
Chronic disease	Yes	44	16.6
	No	221	83.4
Chronic conditions (n=44)	Asthma/COPD	18	40.9
	Diabetes	3	6.8
	Hypertension	7	15.9
Gastrointestinal disease	Yes	49	18.5
	No	216	81.5
Skin disease	Yes	66	24.9
	No	199	75.1
Current medical treatment	Yes	21	7.9
	No	244	92.1
Workplace injury	Yes	261	98.5
	No	4	1.5
Smoking status	Current	199	75.1
	Past	7	2.6
	Never	59	22.3
Alcohol consumption	Yes	27	10.2
	No	238	89.8
Substance abuse	Yes	27	10.2
	No	238	89.8
Betel nut chewing	Yes	72	27.2
	No	193	72.8
Tetanus vaccination	Yes	218	82.3
	No	47	17.7
Hepatitis B vaccination	Yes	3	1.1
	No	262	98.9
COVID-19 vaccination	Yes	180	67.9
	No	85	32.1

As presented in Table 3, 87.5% of respondents reported problems in at least one EQ-5D dimension. Pain/discomfort was the most commonly reported issue (81.1%), followed by anxiety/depression (45.7%) and limitations in usual activities (42.3%). Problems with mobility (32.8%) and self-care (20.4%) were less frequent. The mean EQ-5D utility score was 0.839 ± 0.161 , and the mean EQ-VAS score was 0.821 ± 0.164 , indicating a moderate overall health-related quality of life.

Table 3. Health-Related Quality of Life (EQ-5D) (n = 265)

Dimension	Category	n	%
Mobility	No problem	178	67.2
	Problem	87	32.8
Self-care	No problem	211	79.6
	Problem	54	20.4
Usual activities	No problem	153	57.7
	Problem	112	42.3
Pain/ Discomfort	No pain	50	18.9
	Pain	215	81.1
Anxiety/ Depression	Not anxious	144	54.3
	anxious	121	45.7
EQ-5D health state	No Problem	33	12.5
	Having Problem	232	87.5

EQ-5D Utility Score (UK value set): Mean $\pm$ SD: 0.839 $\pm$ 0.161

EQ-VAS Score: Mean $\pm$ SD: 0.821 $\pm$ 0.164

As shown in Table 4, mobility was significantly associated with gender ($p = 0.021$), age group ($p = 0.040$), work experience ($p = 0.041$), income ($p = 0.038$), and marital status ($p = 0.017$). Gender was also significantly associated with self-care ($p = 0.005$), anxiety/depression ($p = 0.017$), and pain/discomfort ($p = 0.002$). Additionally, glove use was significantly associated with skin problems ($p = 0.023$).

Table 4. Factors Associated with HRQoL Dimensions

HRQoL Domain	Significant Factor	Test Statistic	p-value
Mobility	Gender	Fisher's exact = 8.913	0.021
	Age group	Fisher's exact = 16.16	0.040
	Work experience	$\chi^2 = 13.16$	0.041
	Income	Fisher's exact = 15.9	0.038
	Marital status	Fisher's exact = 20.83	0.017
Self-care	Gender	Fisher's exact = 10.89	0.005
Anxiety/Depression	Gender	Fisher's exact = 10.27	0.017
Pain/Discomfort	Gender	Fisher's exact = 15.325	0.002
Skin problems	Gloves use	$\chi^2 = 5.175$	0.023

Discussion:

This study is the first to assess the health-related quality of life (HRQoL) and associated

factors among solid waste pickers in selected areas of Dhaka City Corporation using the validated EQ- 5D-5L instrument, which measures physical, mental, and social well-being. The findings highlight the demographic, occupational, behavioural, and psychosocial conditions shaping the HRQoL of this marginalized population. The majority of respondents were male (98.1%) and aged between 26 and 54 years (mean 30.58 ± 11.30), consistent with previous studies in similar contexts^{15, 19}. Educational attainment was generally low - 48.7% had no formal education, and 41.9% had only primary education - mirroring findings from other studies^{18, 19}. This limited education restricts health literacy and access to health services, adversely affecting HRQoL²⁰. Nearly half of the participants earned less than 15,000 BDT per month, reflecting financial instability and poverty-related stress, similar to earlier findings in Dhaka^{15, 16}. Most participants were married (77.7%) and had large families, with 60.8% having more than four members, which may increase financial dependency. Despite these hardships, 65.7% expressed satisfaction with their living conditions, demonstrating “adaptive expectations,” a form of psychological resilience²¹.

Over half (53.6%) had been engaged in waste picking for 3-10 years, indicating long-term dependence on this informal occupation, as similarly reported in Hong Kong and South Africa^{22, 23}. Occupational health problems were widespread - back pain affected 22.3%, workplace injuries were nearly universal (98.5%), and chronic diseases were reported by 16.6%, primarily respiratory illnesses (40.91%) and hypertension (15.91%)¹⁹. Skin conditions (24.9%) and gastrointestinal issues (18.5%) were also prevalent,^{18, 19} emphasizing persistent health threats and inadequate medical support among waste pickers, which undermine their HRQoL.

The EQ-5D-5L analysis found that mobility limitations (32.8%), self-care difficulties (20.4%), and problems in usual activities (42.3%). Pain and discomfort were common (81.1%), while 45.7% reported anxiety or depression¹⁹⁻²⁴. The mean EQ-5D utility index was 0.839 (SD ± 0.161), and the mean EQ-VAS score was 0.821 (SD ± 0.164), suggesting a moderately favorable self-perceived health status despite harsh conditions¹⁹.

Behavioral patterns found that high smoking prevalence (75%), likely as a coping mechanism against stress²⁵. Substance use was notable, with 10.2% using addictive substances and 27.2% chewing betel nut. Most respondents reported satisfaction with family (98.1%) and coworker relationships (99.2%), demonstrating emotional resilience and strong social capital²⁶.

Statistical analyses revealed significant associations between HRQoL and socio-demographic and occupational variables. Gender, age, income, and work experience were significantly associated with mobility limitations ($p < 0.05$), and glove use was associated with fewer skin diseases ($\chi^2 = 5.175, p = 0.023$)²⁵.

These findings align with global research illustrating the dual vulnerability of waste pickers - exposure to environmental hazards and systemic exclusion. Formal inclusion in municipal systems can improve public health and sustainability outcomes²⁶. Similar challenges - poor PPE access, inadequate healthcare, and social marginalization - are evident across countries such as Brazil, Tanzania, and South Africa, suggesting a widespread neglect of informal workers' rights^{18, 19, 25}.

In conclusion, waste pickers in Dhaka face interlinked challenges affecting physical, mental, and social well-being. While moderately high HRQoL scores indicate resilience, urgent policy interventions are needed to provide healthcare access, protective equipment, and formal recognition, thereby improving both quality of life and urban waste management sustainability.

Strengths and Limitations

This study provides novel and comprehensive evidence on health-related quality of life (HRQoL) among solid waste pickers in Dhaka, a population that is largely marginalized and underrepresented in occupational health research in Bangladesh. One of the major strengths is the use of the EQ-5D-5L instrument, which is internationally validated, sensitive, and widely used to assess multidimensional HRQoL. The interviewer-administered approach ensured accurate

understanding of questions and minimized misinterpretation, particularly important in a population with low literacy levels. The inclusion of respondents from eleven secondary transfer stations across Dhaka enhances the representativeness of the sample, capturing a wide spectrum of socio-demographic, occupational, and behavioral variability. The study also assessed multiple domains of HRQoL, including physical, psychological, and social dimensions, allowing a holistic understanding of health status among waste pickers.

Despite these strengths, several limitations must be acknowledged. The cross-sectional design limits the ability to establish causal relationships between occupational exposures or socio-demographic factors and HRQoL outcomes. All data were self-reported, which introduces potential recall bias and social desirability bias, particularly for behavioral variables such as smoking, substance use, or adherence to protective measures. Although the EQ-5D-5L is a validated instrument, utility scores were calculated using the UK value set due to the absence of a Bangladesh-specific preference set, which may limit the contextual accuracy of the health utility estimates. Furthermore, the study did not include clinical assessments or objective measures of health status, which could have provided additional validation of self-reported outcomes. Finally, while the sample was diverse, it may not capture all informal waste pickers in Dhaka, particularly those operating in unregistered or illegal sites, which could influence the generalizability of findings to the entire population of waste pickers.

Conclusion:

This study assessed the health-related quality of life (HRQoL) of solid waste pickers in Dhaka City Corporation using the EQ-5D-5L instrument, revealing substantial occupational, physical, and psychological challenges. Most respondents were male, frequently injured at work, and suffered from chronic conditions such as asthma/COPD and hypertension, while the use of protective gear remained low. Despite these hardships, participants reported moderate to good HRQoL, reflecting resilience supported by strong social relationships. To safeguard this vulnerable workforce, interventions should prioritize

regular medical screening, wider vaccination coverage, access to personal protective equipment, and training on hygiene and disease prevention. Integrating mental health support and formally recognizing waste pickers within urban waste management systems are essential for promoting health equity and sustainable waste governance.

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Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References:

1. Barupal T, Chittora D, Meena M. Solid Waste: Characterization, Assessment, Monitoring, and Remediation. In: *Advances in Waste-to-Energy Technologies*. CRC Press; 2019.
2. Park K. Park's Textbook of Preventive and Social Medicine [Internet]. 26th ed. Jabalpur, India: Banarsidas Bhanot Publishers; 2021 [cited 2026 Feb 7]. Available from: <https://www.slideshare.net/slideshow/k-park-26th-edition-new-updatespdf/265034347>
3. Tchobanoglous G, Kreith F. Handbook of Solid Waste Management. New York McGraw-Hill Education. - References - Scientific Research Publishing [Internet]. 2nd ed. 2002 [cited 2026 Feb 7]. Available from: <https://www.scirp.org/reference/referencepapers?referenceid=2965584>
4. UNEP. Global Waste Management Outlook [Internet]. 2024 [cited 2026 Feb 7]. Available from: <https://www.unep.org/resources/global-waste-management-outlook-2024>
5. Kaza S, Yao LC, Bhada-Tada P, Van Woerden F. Open Knowledge Repository [Internet]. 2018. doi:<https://doi.org/10.1596/978-1-4648-1329-0>
6. Talukder A, Mazumder S, Al-Muyeed A, Shadullah A. Solid Waste Management Practice in Dhaka City. *Urban Health J*. 2012 Feb 13;2(9):45–55.
7. Roy S, Sowgat T, Mondal J. City Profile: Dhaka, Bangladesh. *Environ Urban* ASIA. 2019 Sep 1;10(2):216–32. doi:10.1177/0975425319859126
8. Islam FAS. Characterization and Resource Potential of Household Solid Waste in Dhaka, Bangladesh: A Pathway to 3R Optimization and Sustainable Energy Recovery. *J Glob Ecol Environ*. 2025 Jul 7;21:176–207. doi:10.56557/jogee/2025/v21i39474
9. Prodhan AHMSU, Kaeser A. Municipal Solid Waste Management in Dhaka City: Present Status, Problems and Probable Solutions. In. 2019. p. 80–118.
10. Malak M, Prema S, Sajib A, Hossain N. Livelihood of Independent Waste Pickers (Tokai) at Dhaka City in Bangladesh: Does it Incidental Choice of them? *Indones J Geogr*. 2022 May 20;54. doi:10.22146/ijg.65461
11. Alam MdM, Hossain M, Islam N, Murad M, Khan N. Impacts of health and economic costs on street children working as waste collectors in Dhaka City. *Int J Environ Sustain Dev*. 2021 Jan 1;20:29. doi:10.1504/IJESD.2021.10034773
12. Feng YS, Kohlmann T, Janssen MF, Buchholz I. Psychometric properties of the EQ-5D-5L: a systematic review of the literature. *Qual Life Res Int J Qual Life Asp Treat Care Rehabil*. 2021 Mar;30(3):647–73. doi:10.1007/s11136-020-02688-y PubMed PMID: 33284428; PubMed Central PMCID: PMC7952346.
13. UNDP. UNDP [Internet]. 2026 [cited 2026 Feb 22]. Sustainable Development Goals. Available from: <https://www.undp.org/sustainable-development-goals>
14. Dolan P. Modeling valuations for EuroQol health states. *Med Care*. 1997 Nov;35(11):1095–108. doi:10.1097/00005650-199711000-00002 PubMed PMID: 9366889.
15. Uddin SMN, Gutberlet J, Ramezani A, Nasiruddin SM. Experiencing the Everyday of Waste Pickers: A Sustainable Livelihoods and Health Assessment in Dhaka City, Bangladesh. *J Int Dev*. 2020 Aug;32(6):833–53. doi:10.1002/jid.3479
16. Malak MdA, Prema SF, Sajib AM, Hossain NJ. Livelihood of Independent Waste Pickers (Tokai) at Dhaka City in Bangladesh: Does it Incidental Choice of them? *Indones J Geogr*. 2022 Apr 20;54(1). doi:10.22146/ijg.65461

17. Silveira R, Silva F, Ribeiro I. Occupational profile and exposure of solid waste collectors from a Brazilian municipality. *Rev Enferm Referência*. 2018 Jun 29;IV Série(17):73–84. doi:10.12707/RIV17079
18. Melaku HS, Tiruneh MA. Occupational Health Conditions and Associated Factors Among Municipal Solid Waste Collectors in Addis Ababa, Ethiopia. *Risk Manag Healthc Policy*. 2020 Nov;Volume 13:2415–23. doi:10.2147/RMHP.S276790
19. Velasco Garrido M, Bittner C, Harth V, Preisser AM. Health status and health-related quality of life of municipal waste collection workers – a cross-sectional survey. *J Occup Med Toxicol*. 2015 Dec;10(1):22. doi:10.1186/s12995-015-0065-6
20. Karimi M, Brazier J. Health, Health-Related Quality of Life, and Quality of Life: What is the Difference? *PharmacoEconomics*. 2016 Jul;34(7):645–9. doi:10.1007/s40273-016-0389-9
21. Blaauw P, Pretorius A, Viljoen K, Schenck R. Adaptive Expectations and Subjective Well-being of Landfill Waste Pickers in South Africa's Free State Province. *Urban Forum*. 2020 Mar;31(1):135–55. doi:10.1007/s12132-019-09381-5
22. Schenck R, Blaauw PF. The Work and Lives of Street Waste Pickers in Pretoria—A Case Study of Recycling in South Africa's Urban Informal Economy. *Urban Forum*. 2011 Dec;22(4):411–30. doi:10.1007/s12132-011-9125-x
23. Chan SM, Xu H, Tang YK, Zhang J, Kwok K, Lam BYH, et al. Determinants of depression and anxiety in informal waste pickers: a cross-sectional study of informal waste pickers in Hong Kong. *Int J Equity Health*. 2024 Nov 29;23(1):257. doi:10.1186/s12939-024-02342-w
24. Akter K, Hawlader N, Hoque MAA. AN ASSESSMENT OF HEALTH HAZARDS AND AWARENESS OF WASTE PICKERS: A CASE STUDY OF MATUAIL SANITARY LANDFILL OF DHAKA CITY.
25. Makhubele M, Ravhuhali K, Kuonza L, Mathee A, Kgalamono S, Made F, et al. Common Mental Health Disorders among Informal Waste Pickers in Johannesburg, South Africa 2018—A Cross-Sectional Study. *Int J Environ Res Public Health*. 2019 Jul 23;16(14):2618. doi:10.3390/ijerph16142618
26. Uddin SMN, Gutberlet J, Ramezani A, Nasiruddin SM. Experiencing the Everyday of Waste Pickers: A Sustainable Livelihoods and Health Assessment in Dhaka City, Bangladesh. *J Int Dev*. 2020 Aug;32(6):833–53. doi:10.1002/jid.3479