



The Risks and Safety Practices of Waste Pickers at Selected Dumping Sites in Pretoria, South Africa, During the COVID-19 Pandemic

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ABSTRACT

Amid the COVID-19 outbreak, the accumulation of household waste continued to rise as the number of COVID-19 patients increased. COVID-19 can survive and be transmitted from contaminated surfaces, making waste pickers more vulnerable and at risk of contracting and spreading the virus through contact with infected household waste. The study assessed safety practices and risks related to waste picking during the COVID-19 pandemic at two selected dumping sites in the north of Pretoria. Structured questionnaires were used to collect data from 81 waste pickers at these landfill sites. Results showed that 100.0% of waste pickers at Site A and 86.7% at Site B collected plastics; 96.7% at Site A and 90.5% at Site B collected bottles; and 100% at Site B and 95.5% at Site A collected metals. The majority, 92.0% at Site A and 90.0% at Site B, were aware of the dangers and risks associated with waste handling if protective gear was not worn. From sites A and B, 97.0% and 90% of the waste pickers respectively had heard of COVID-19, although 51.9% from both sites believed they could not contract COVID-19 while handling waste. Only 18.0% of waste pickers from Site A and 82.0% from Site B faced challenges with purchasing their own PPE. All waste pickers at Site A wore facial masks, whereas 86.0% at Site B did so. Regarding testing for COVID-19, 22.0% from Site A and 19.0% from Site B were tested, with 2.0% from Site A and none (0.0%) from Site B testing positive. It is recommended that all waste pickers be educated about COVID-19 transmission and provided with PPE during the pandemic.

INTRODUCTION

Amid the COVID-19 outbreak, the piling of household waste continued to rise as the number of COVID-19 patients increased daily (Saadat et al. 2020). COVID-19 was asserted as a global pandemic due to the high spreading of the virus. World Health Organization (WHO) defined it as an infectious disease spread through droplets of saliva or mucus when an infected person coughs or sneezes (WHO 2020). The COVID-19 could survive and be transmitted from infected surface materials (WHO 2020). Its sustainability in aerosols, plastic, stainless steel, copper, and cardboard was 3, 72, 48, 4, and 24 hours, respectively (van Doremalen et al. 2020), or could persevere on other nonliving surfaces like glass and metals for as long as 9 days (Kampf et al. 2020). Due to the prolonged relative sustainability of the COVID-19 virus on various surfaces, there was a concern about the potential presence of the virus in discarded waste (van Doremalen et al. 2020). This could lead to transmission through contact with contaminated surfaces or objects if proper safety precautions

were not taken. While the general public implemented precautionary measures against COVID-19, daily disposal of items such as masks, gloves, empty hand sanitizer bottles, and used tissues (Saadat et al. 2020) added to the regular waste in dustbins or landfill sites. Used masks, in particular, needed to be handled with care, as they could be infectious, thereby posing a greater risk to waste disposal workers and the broader community (Rhee 2020).

Waste generated by households and businesses that are not associated with healthcare facilities is treated as non-infectious waste that is not required to be managed. According to the Department of Environmental Affairs and Tourism (DEAT) (2005), there are no declared systems for source separation in South Africa, and this leaves waste pickers more vulnerable and at risk of contracting diseases that are transmitted through direct contact with contaminated waste (Lisk 1991, Pleus & Kelly 1996), such as COVID-19.

High population growth rates in most African countries due to industrialization, urbanization, and increased middle-

class society have contributed to increased generation of solid waste (Simelane & Mohee 2015, Chimuka & Ogola 2015, Muzenda et al. 2012). The increased generation of waste, coupled with declining infrastructure for solid waste management, has led to local authorities' inability to manage waste effectively (Dlamini et al. 2019).

In South Africa, as well as in most developing and developed countries, the prime method of waste disposal is the use of landfill systems (Ketlogetswe & Mothudi 2005, Mothiba et al. 2016). Waste pickers handle large quantities of recyclable waste in landfill sites (Komane 2014). Even though some landfill sites are well operated and follow the international best practices in South Africa, only 44.0% of the 1280 landfill areas are authorized to operate through the permits, and there is rare auditing for compliance with the conditions of the permits (Godfrey & Oelofse 2008).

The waste sector has been recognized as an industry capable of contributing to economic growth and job creation for both skilled and unskilled workers (Department of Science & Technology 2013). Municipal waste from households and commercial activities has become an economic resource for others (Kum et al. 2005). Consequently, many South Africans are turning to waste picking, which plays a crucial role in reducing waste and extending the lifespan of landfill sites by preventing them from filling up quickly (Medina 2008). However, waste picking remains inadequately regulated, unsupported, and unrecognized by authorities (Komane 2014).

Waste pickers collect, sort, and sometimes clean recyclable or reusable waste for sale or personal use (Oelofse & Strydom 2010). Approximately 1.0% of the population, or about 15 million people in urban areas, earn a living by salvaging recyclable waste in developing countries (Medina 2008). Around 2004/2005, about 37,000 waste pickers in South Africa were making a living from waste picking (Langenhoven & Dyssel 2007), often under unsafe and hazardous conditions (Oelofse & Strydom 2010). Research indicates that with proper support and organization, waste picking can lead to public investments in poor communities, resulting in poverty reduction, job creation, conservation of natural resources, and environmental protection (Medina 2008).

Waste pickers are exposed to occupational health risks such as diseases because of the direct contact that they make with decomposed materials and potential bio-aerosols that cause the spreading of several different diseases (Coffey & Coad 2010, Pilusa & Muzenda 2013, Mothiba et al. 2016, Ray et al. 2005). The deficiency of proper devices for protection contributes further to undesirable and unhygienic working conditions of the waste pickers (Mothiba et al. 2016).

Since solid waste is a source of income and contributes to job opportunities, waste pickers must be informed and educated about appropriate and safe practices for handling waste. Several studies have looked at facets and problems associated with the management of solid waste in particular related to the recycling of the collected waste (Simatele et al. 2017, Baker & Letsoela 2016). Researchers have been concerned about the minimum attention that is given to the health risks associated with waste pickers (Noel 2010, Chattopadhyay et al. 2009). In South Africa, studies in the Free State Province have looked at landfill waste pickers and street waste pickers in 9 landfill sites with 400 waste pickers (Blaauwet et al. 2015).

Even though research has been done on waste pickers who live and work in landfills or dumping sites in South Africa (Schenk & Blaauw 2011), to the best of our knowledge and at the time of doing this study, there had not been any studies done on waste pickers during the COVID-19 pandemic. The waste pickers worked in groups, handled and made direct contact with the waste, which could be contaminated with the COVID-19 virus from the households of infected people. As a result, the waste pickers were vulnerable to being infected with the COVID-19 virus. Hence, the study assessed the safety practices and risks related to waste picking during the COVID-19 pandemic at the selected dumping sites in the north of Pretoria.

MATERIALS AND METHODS

The study was exploratory, purposive, and based on voluntary participation, relying on the waste pickers' willingness to engage. The purpose of the study was explained to the waste pickers, and consent was sought before data collection. They were informed that participation was purely voluntary, that they could withdraw at any time, and that their unwillingness to participate would not negatively affect or disadvantage them.

The study involved interviewing 81 waste pickers using structured questionnaires developed by the researchers. These questionnaires included both open-ended and close-ended questions. The interviews were conducted orally to assist those waste pickers who could not read or write and to minimize misunderstandings and misinterpretations. This approach also served as a preventive measure against COVID-19 transmission through the exchange of questionnaires between the researcher and the waste pickers.

Sixty waste pickers were from Site A, while twenty-one were from Site B. Sampling had to be abandoned due to the emergence of a new COVID-19 variant. All preventive and safety measures related to COVID-19 were strictly followed

by the researcher during data collection. These measures included wearing full protective gear (mask, boots, long-sleeved clothing, and gloves), frequent sanitizing, social distancing, and hand washing whenever possible.

The general information sought from the waste pickers through the questionnaires included demographic details, safety practices, health status, attitudes and knowledge of COVID-19, and preventive measures against it.

RESULTS AND DISCUSSION

Table 1 below shows the demographic information and working conditions of the waste pickers at the two dumping sites (sites A and B). From Site A, 87.0% of the waste pickers were above 30 years old, whereas slightly more than half (52.0%) of the waste pickers from Site B were between the ages of 20 and 30 years. These results are not comparable to those in Schenck & Blaauw (2011), where the majority of the street waste pickers were in the age range between 40 and 49 years old. In Samson (2010), the majority of waste pickers were found to be much older than the average age of 28 years old, while in Chvatal (2010), waste pickers included people who were over 60 years old in the Western Cape.

There were slightly more females (53.0%) than males (47.0%) at Site A, whereas at Site B, there were more males (62.0%) than females, who made up 38.0% of the waste pickers. The study conducted on waste pickers in Pretoria by Schenck & Blaauw (2011) found more males (97.2%) practicing waste handling from the streets than females due to males being able to travel long distances searching for recyclables while carrying hefty piles of waste like waste pickers on streets compared to the females (Schenck & Blaauw 2011, Viljoen 2014). Mothiba et al. (2016) also found more females (66.0%) handling waste around Pretoria landfill sites than males, even though this might have changed over the years. According to Viljoen (2014), most of the waste pickers in South Africa are males, while Samson (2010) argues that the variation in gender becomes more prominent when looking at materials that are being collected. In Benson & Vanqa-Mgijima (2010), females were found to make only a small proportion of waste pickers in Cape Town. In China, older women are waste pickers (Schenck & Blaauw 2011).

The uneven distribution of gender at sites A and B in the current study could be due to various factors, such as females at Site A being more willing to take part in the study than males. At Site B, males were more willing to partake in the study. Other waste pickers mentioned that they did not want to participate in the study because there was no compensation or gain for them, while some thought it would waste their

time. Others had come across bad experiences from taking part in previous studies where they were promised things and were not given feedback on the results of the studies.

About 69.0% and 76.0% of waste pickers from sites A and B, respectively, had no matric qualification, which is considered to be the lowest level of education a person could have before being considered for employment (Table 1). These results are comparable with those in Blaauw et al. (2015), where more (49.0% and 29.0%) waste pickers at landfill sites had secondary and primary education, respectively, in the Free State Province in 2012. According to Schenck & Blaauw (2011), people who are unskilled and unemployed get a chance to infiltrate the informal economy so that they can earn money through waste picking. According to Theron (2010), it is easier to get into waste picking because there is no requirement for any qualification or permits. Waste picking forms part of the informal economy, as it is unregulated, labor-intensive, and unsystematically pays low wages (Medina 2007, Gill 2007). According to Blaauw et al. (2015), it is an untrained line of work that gives unskilled laborers the prospect of entering the labor market with no entry barriers.

During lockdown level 1, waste pickers from Site A were grouped into two groups, and this resulted in them working during alternate working days per week, with each waste picker working for 2 to 3 days per week (Table 1). This could have resulted in less money being made by the waste pickers from the selling of the waste. However, at Site B, the majority (95.0%) of the waste pickers worked for more than 5 days per week, and some of them even lived on-site throughout the week. Only 5.0% of the waste pickers worked for a period of between 3 and 4 days. This led to the waste

Table 1: The demographic information and working conditions of the respondents at the two dumping sites.

Demographic Information and Working Conditions		Number of waste pickers (%)	
		Site A	Site B
Age (years)	20 – 30	13	52
	>30	87	48
Gender	Male	47	62
	Female	53	38
Education	Below matric	69	76
	Matric	23	19
	Tertiary	8	5
Number of days working at the dumping site per week	1-2	100	0
	3-4	100	5
	>5	0	95

Table 2: Percentage (%) of waste pickers collecting different items at the two dump sites.

Type of waste collected	Number of waste pickers (%)	
	Site A (%)	Site B (%)
Plastics	100	90.5
Metals	86.7	100
Bottles	96.7	90.5
Paper-products	100	100

pickers at Site B being in a better position to generate more income compared to their counterparts in Site A.

Table 2 shows the percentage (%) of waste pickers collecting similar items at the two dumpsites. From the two dumping sites, 100.0% and 90.5% of the waste pickers from Sites A and B, respectively, collected plastics. From Site B, all waste pickers collected metals, whereas 86.7% of the waste pickers from Site A collected plastics. With regards to bottles, 96.7% and 90.5% of waste pickers from sites A and B, respectively, collected bottles from the waste. According to Ali & Alharbi (2020), COVID-19 can survive for an extended period of time on various surfaces from where it can be transmitted. The coronavirus can survive for 3 hours in aerosols, 72 hours in plastic and stainless steel, 4 hours in copper, and 24 h in cardboard (Ali & Alharbi 2020). Most of the waste or recyclables were mainly collected by waste pickers from both landfill sites, resulting in increased chances of COVID-19 transmission and infections amongst waste pickers.

The responses of the waste pickers from each of the dumping sites on the protective measures taken by the waste pickers and the awareness of risks and injuries associated with handling waste are shown in Table 3 below. Ninety-seven percent (97.0%) of waste pickers from Site A and 57.0% from Site B indicated that they used tools such as chisels to break glass. The minority of waste pickers (3.0% from Site A and 43.0% from Site B) did not use any tools when handling waste. From the two sites, 57.0% and 24.0% of the waste pickers from sites A and B, respectively, used safety goggles, whereas 33.0% and 76.0% of the waste pickers from sites A and B, respectively, did not wear any safety goggles when handling waste (Table 3). Most waste pickers who used goggles were those who collected glasses and wore goggles only when they were breaking glass before they could sell it to the buyers.

The majority (92.0% and 90.0% of waste pickers from sites A and B, respectively) reported that they were fully aware of the dangers and risks associated with waste handling (Table 3). The few risks/dangers that waste pickers from Site A landfill mentioned included physical damage to the

body, chemical fumes, toxic gases, dust causing diseases, being hit by a dumping truck if not careful, slipping and falling from the slippery floor, especially if it had rained, getting hurt or cut from sharp/broken objects if not wearing protective gear. However, risks/dangers mentioned by waste pickers from Site B were injuries from vehicle accidents and sharp broken objects (e.g., needles), getting sick from medical waste and dirt particles blown by the wind, or being exposed to toxins from chemicals and diseases such as TB, HIV, and COVID-19.

From sites A and B, 2.0% and 29.0% of the waste pickers, respectively, reported injuries while at work, whereas 98.0% and 71.0% of the waste pickers from sites A and B, respectively, had not suffered any injuries while working at the dumping sites. The 2.0% from Site A reported that they had been burnt by acid while at work, whereas the 29.0% from Site B had suffered foot injuries, broken hands, deep cuts on hands due to broken glass, injuries from fights with colleagues, and being hit on the head by offloading trucks. According to Coffey & Coad (2010), there has to be an enforcement of procedures such as reversing trucks at the landfill sites by the supervisors, as this is a common source of accidents. In most cases, the waste pickers usually jump onto trucks to get access to waste that is being offloaded even before the trucks can stop.

Fig. 1 below shows the responses of the waste pickers on the substances they were exposed to while working. Most (97.0% and 92.0%) of the waste pickers from Site A and Site B, respectively, indicated that they had been exposed to dust when handling waste. All the waste pickers (100.0%) from Site B indicated that they were exposed to sharp, broken objects such as metallic nails and broken glasses when handling waste. This could have resulted in the waste pickers being susceptible to injuries while at work. Fewer waste pickers indicated that they were exposed to leachates and pollutants, with 23.0% of waste pickers from Site A and 43.0% from Site B mentioning that they were exposed to toxic gases. Only 48.0% and 8.0% of the waste pickers from

Table 3: Responses of waste pickers on use of tools, awareness of risks associated with waste handling, and injuries at work.

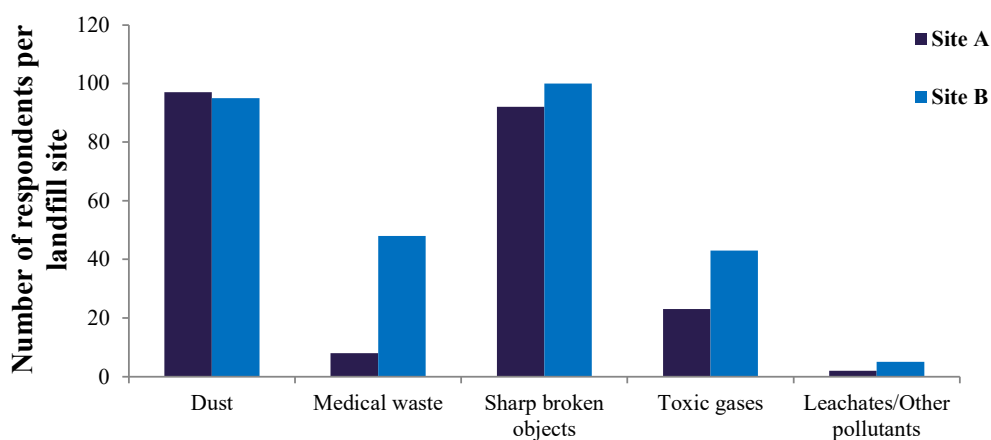
Protective measures and injuries when handling waste	Number of waste pickers (%)			
	Site A		Site B	
	Yes	No	Yes	No
Use of waste handling tools	97	3	57	43
Wearing safety goggles	57	33	24	76
Use of gloves	100	0	100	0
Wearing of boots	100	0	100	0
Awareness of risks at work	92	8	90	10
Injuries sustained at work	2	98	29	71

sites A and B, respectively, revealed that they were exposed to medical waste while handling waste, even though the management had mentioned that they only received general waste. Such exposures, especially to medical waste, could place waste pickers' health at risk of infections, especially now that there is COVID-19.

Fig. 2 shows that 20.0% of those from Site A and 43.0% from Site B had consulted in the past 6 months. Most of those who had consulted in the past 6 months didn't want to disclose their reasons for consultations, with only a few mentioning that they had consulted so that they could collect their diabetes medication or had gone for dentist appointments, for flu, persistent headache, hand injuries, and general check-ups for HIV. According to the Centers for Disease Control and Prevention (CDCP) (2020), people at

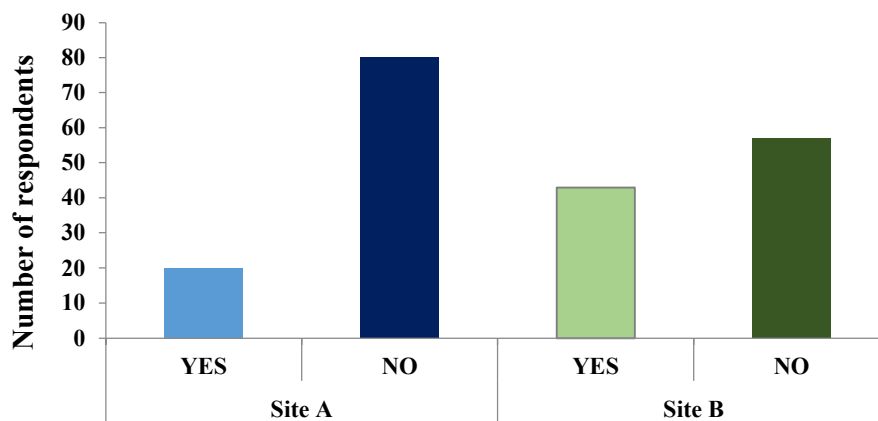
high risk of COVID-19 infection are those with underlying medical conditions such as asthma, BP, weakened immune system, diabetes, and HIV, which were some of the medical conditions that a few of the waste pickers had mentioned as the reasons for their medical consultations. As a result, some of the waste pickers were at a high risk of being infected with COVID-19.

Fig. 3 below shows the responses of waste pickers on the experiences of certain prevalence symptoms that they had. The majority (60.0%) of the waste pickers from Site A and 76.0% from Site B indicated that they suffered from tiredness, which was normal for people who worked tirelessly for a prolonged period regardless of weather conditions. Only 52.0% and 23.0% reported back pain, whereas 33.0% and 27.0% had joint pain from sites B and A, respectively, which



Substances waste pickers are exposed to while working

Fig. 1: Responses on the substances that waste pickers are exposed to while handling waste.



Responses of the waste pickers per dumping site

Fig. 2: Responses of waste pickers on having medical consultation in the last 6 months.

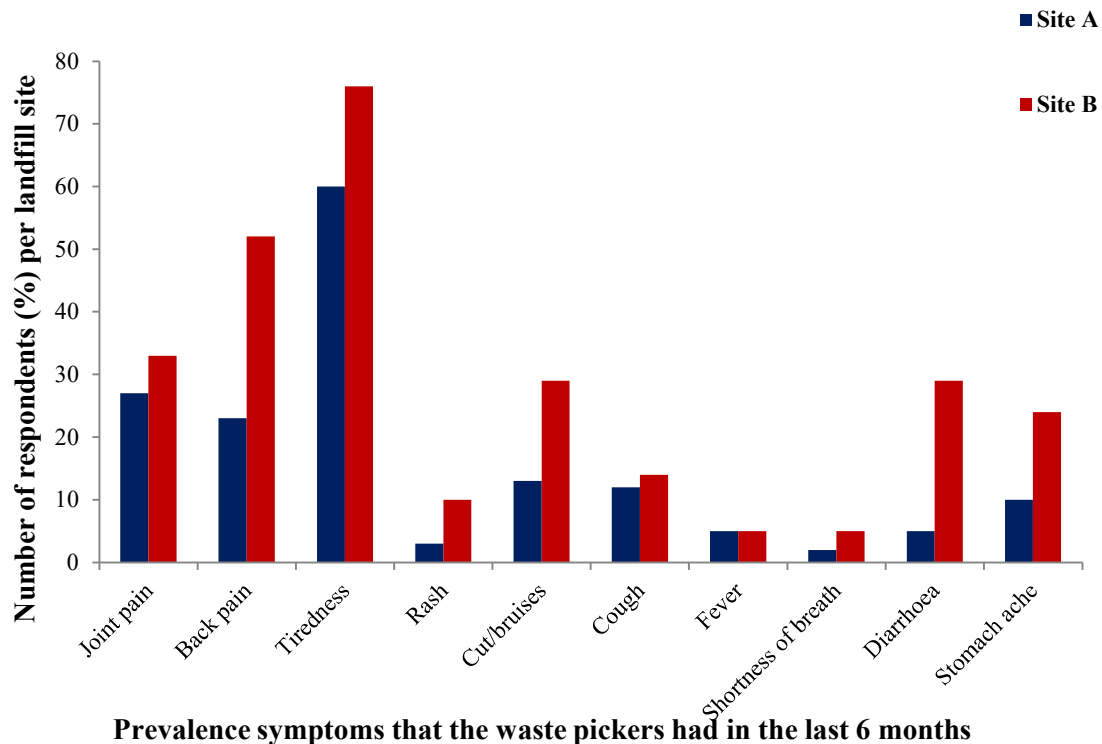


Fig. 3: Responses of waste pickers on the experiences of certain prevalence symptoms.

might be common due to the requirement of their work to bend when collecting waste and carrying heavy waste from one place to another. This hard labour might also explain the reason why the majority of them were suffering from tiredness, time after time. Very few waste pickers from both sites experienced shortness of breath and fever. According to Huang et al. (2019) and Hui et al. (2020), the prevalence symptoms similar to those of COVID-19 include tiredness, muscle pain, sneezing, sore throat, dry cough, high fever, respiratory problems, and kidney failure.

Table 4 below shows the responses of waste pickers from the two dumping sites on the knowledge of COVID-19, accessibility to water, and whether they practiced social distancing while working at the dumping sites. The majority (97.0%) and (90.0%) of waste pickers from sites A and B, respectively, indicated that they had heard of COVID-19.

The few preventative measures against COVID-19 that waste pickers from the two dumping sites mentioned were the use of PPEs such as masks and gloves, practicing social distancing, no handshakes, and frequent hand washing or sanitizing. The majority (75.3%) of all the waste pickers stated that they practiced social distancing, with the remaining 24.7% saying that it was difficult to practice social distancing when they were all handling waste at the same time after the waste had been offloaded from the trucks. The

researcher however, observed that while collecting waste, there was no social distancing at all practiced by the waste pickers. These contradicting responses by waste pickers and observations made by the researchers indicated the unreliability of the responses and results in the current study.

The waste pickers mentioned that the strict lockdown regulations, especially during lockdown 5 when they could not work, contributed to a loss of income and buyers of waste. Slightly more than half (51.9%) of the waste pickers from both dumping sites believed that they could not get COVID-19 while handling waste. This could indicate a lack of knowledge on the transmission of COVID-19 from surfaces and materials by the waste pickers.

All (100.0%) waste pickers from Site A and 95% from Site B had access to running water. It was, however, observed that in both dumping sites, there was no running water and that the water was brought daily in tanks even though the tanks seemed inadequate. Fewer (12.0%) waste pickers from Site A compared to the majority (62.0%) of the waste pickers from Site B stated that they found it difficult to practice social distancing when picking waste together at the same time when waste was offloaded from the truck. It was also observed by the researcher that there was no social distancing at the dumping sites even though the majority (88.0%) of the waste pickers from Site A and 38% from

Site B had mentioned that they practiced social distancing while working.

Some waste pickers, as shown in Table 4, had challenges with buying PPE due to lack of money and high expenses of the PPEs. Waste pickers at Site A were provided with PPE such as masks and gloves by the site management after reopening during lockdown level 1, even though some of the waste pickers could have been absent on the days when they were given PPEs and hence had to buy their own PPEs. As a result, only 18.0% of the waste pickers from Site A mentioned that they had challenges with buying their PPEs, while the majority (82.0%) of the waste pickers from Site B had challenges with getting PPEs.

With regards to the two dumping sites, all (100.0%) of the waste pickers from Site A wore facial masks on the days when the interviews were conducted, whereas at Site B, about 86.0% of the waste pickers wore the facial masks, while some of the women waste pickers made use of their head cloths as facial masks. The researcher observed the lack of facial masks at Site B during the interviews, and facial masks were donated to the waste pickers at Site B by the researcher. Nevertheless, 14.0% of waste pickers from Site B disclosed that they did not like wearing masks as they were not comfortable breathing through them, whereas some of those who used masks from both sites mentioned that they were only wearing them due to the COVID-19 regulations and did not use them before the COVID-19 pandemic. This is supported by Mothiba et al. (2016), who stated that waste pickers still found it challenging to make use of PPEs such as masks even though they were exposed to dust and unpleasant odors at their workplace on a daily basis.

Table 4 below shows that from the two sites, 22.0% from Site A and 19.0% from Site B of the waste pickers tested for COVID-19. Of those who had tested, 18.0% and 19% from Sites A and B, respectively, had tested negative, while 2.0% from Site A and none (0.0%) of the waste pickers from Site

Table 4: The responses of the waste pickers regarding the adherence to the COVID-19 safety and regulations.

Responses to COVID-19 safety protocols and regulations	Number of waste pickers (%)	
	Site A	Site B
Knowledge/awareness of COVID-19	97	90
Practicing social distancing	88	38
Difficulty in practicing social distancing when handling waste	12	62
Access to water	100	95
Wearing of masks	100	86
Challenge with access to PPE	18	82
Testing for COVID-19	22	19

B had tested positive. Only 2.0% of the waste pickers from Site A were still awaiting the COVID-19 results. Most of the waste pickers thought COVID-19 screening was the same as being tested for COVID-19. At Site A, all waste pickers and everyone who entered the premises were screened for COVID-19, whereas at Site B, there was no COVID-19 screening for whoever entered the site. The suggestions made by waste pickers on how they could be assisted with regards to their protection against COVID-19 and other infections were that they should be supplied with PPE, more water and be given assistance with health issues such as the supply of medication, and be screened for COVID-19 upon entrance at Site B.

CONCLUSIONS

Waste pickers mainly practiced waste picking for economic reasons regardless of the risks associated with the job. The majority of waste pickers were fully aware of the health risks associated with handling waste during the COVID-19 pandemic. Even though most waste pickers used PPEs, such as gloves, boots, masks, and protective glasses, for their protection against injuries and possible diseases such as COVID-19, there were still waste pickers who had challenges with getting PPEs, such as masks. Even though the practices of safe waste handling by the waste pickers and the knowledge they had of COVID-19 measures placed them at a much lower risk of being infected by COVID-19, it was disturbing that half of the waste pickers stated that they did not believe they could be exposed to the COVID-19 while handling waste. It is therefore recommended that there should be education on COVID-19 transmission, provision of free PPEs, sanitizers, more water, and COVID-19 screening to all the waste pickers. More monitoring and checking for adherence to safe waste handling at all dumping sites should be practiced by the dumping site personnel or management.

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