Texila International Journal of Public Health
ISSN: 2520-3134
DOI: 10.21522/TIJPH.2013.13.02.Art053

Hand Washing as a Preventive Measure to Covid-19 By Communities in Kadoma City, Zimbabwe

A. Chimbaru[1*], D. Chirundu[2], N. Midzi[3]
[1]*Texila American University*
[2]*Kadoma City Health Dept, Kadoma Zimbabwe*
[3]*National Institute of Health Research, Zimbabwe*

Abstract

Hand washing with soap and water, as well as the use of disinfectant, was confirmed as an effective intervention to prevent the transmission of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). Transmission of SARS-CoV-2 continues despite the evidence that hand washing contributes to the reduction of transmission. Compliance with handwashing varies globally and remains a challenge in several countries, including Zimbabwe. A case-control study design was used to investigate compliance with hand washing as a COVID-19 preventive measure. We recruited 402 respondents for the study. Of these, 206 case respondents were selected using random numbers generated by Excel 2017, which were then matched to the line listing. The remaining 186 controls were selected based on proximity to confirmed cases. We used an interviewer-administered questionnaire to collect data. Analysis was done using Epi-Info 7 software. Eighty-six per cent (86%) of the total respondents indicated that they washed their hands using soap and water for the recommended 20 seconds. Only 41% (164) of the respondents washed their hands after touching their faces, and 49% washed their hands after touching surfaces. The bigger proportion of respondents, 94% and 90%, could easily get water and soap for hand washing, respectively. We conclude that compliance with handwashing was low, less than 50% amongst the communities of Kadoma after touching the faces and/or surfaces contrary to WHO recommendations, though over 90% had access to water and soap. This could be attributed to non-commitment, poor attitude and practices by the respondents.

Keywords: *COVID-19, Compliance, Hand Washing, Kadoma.*

Introduction

The national authorities in China reported to the WHO cases of pneumonia of unknown aetiology, which were later laboratory confirmed as a novel coronavirus (2019-nCoV) [19]. COVID-19 was declared a Public Health Emergency of International Concern by the World Health Organisation on 30 January 2020 [20] and as a pandemic on 11 March 2020 [21]. The World Health Organisation recommended Public Health and Social Measures (PHSM) interventions which included physical distancing, avoiding crowded settings, washing hands frequently, respiratory etiquette and mask-wearing [18]. According to WHO, PHSMs have contributed to limiting the transmission of SARS-CoV-2 and reducing hospitalisation and deaths due to COVID-19 [23]. The recent evidence that touching contaminated surfaces followed by touching of the mouth, nose or ears contributes to the transmission of COVID-19 in different settings makes hand hygiene critical in the control of SARS-CoV-2 [17].

Hand hygiene has therefore become an effective infection control mechanism in the prevention of contracting SARS-CoV-2 [7]. According to WHO, hand hygiene is an

Received: 28.01.2025 ***Accepted: 19.04.2025*** ***Published on: 30.06.2025***
****Corresponding Author: achimbaru@ gmail.com***

important vital intervention used for safe health care delivery, yet practice of care remains suboptimal in many countries, with compliance as low as 40% in some countries and 2% in low-income countries [22]. Hand hygiene compliance includes washing hands with soap and water using appropriate techniques to remove microorganisms. If done appropriately, it is the most efficient and cost-effective intervention that can be implemented in the healthcare setting [6].

Availability of soap and water in households in a study conducted in sub-Saharan Africa was noted to be between 5% and 64% across different countries [8]. In a study conducted in Kenya, it was noted that lack of water and soap, as barriers to hand hygiene practices, only 59% of respondents had access to water [13]. Hand hygiene was found to be a challenge in a study conducted in Zimbabwe, where cultural handshaking was a symbol for paying condolences at funerals, availability of water and soap were also factors. It was also noted that participants were not used to washing hands frequently and did not follow recommended procedures during COVID-19 [12], though they were conversant with the need to maintain hand hygiene [11]. Communities experienced pandemic fatigue during phase 3 of the outbreak in Zimbabwe, thereby were no longer complying with putting on masks, practising social distancing and frequent handwashing [15]. In another study conducted in Zimbabwe, hand hygiene was found to be unnatural, and people were less likely to adhere to the control measures [14].

While hand washing was found to be an effective intervention by the WHO and other technical bodies, COVID-19 continues to be reported in several countries with resources to provide water, soap, and disinfectants to wash/disinfect hands. The challenge could be due to non-compliance with PHSM due to individual attitude or lack of commitment. According to the Theory of Planned Behaviour [1], the stronger the intention to engage in a behaviour, the more likely that behaviour can be performed when the individual is willing to do so. Figure 1 below shows the Theory of Planned Behaviour.

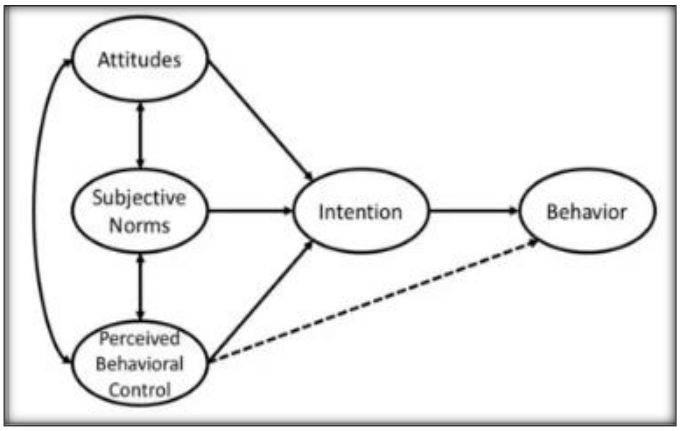

Figure 1. Theory of Planned Behaviour

The objective of this study was to assess compliance with hand hygiene to prevent COVID-19 transmission in Kadoma City.

Materials and Methods

Study Design

A case-control study design was used to investigate factors affecting compliance with COVID-*19* preventive measures. A case was defined as a resident of Kadoma City who tested positive using PCR or RDT during 2021. A control was any resident of Kadoma who was not infected by COVID-19 and did not show any signs or symptoms of COVID during 2021.

Study Setting

The study was conducted in Kadoma City, one of the 32 urban centres in Zimbabwe, with an estimated population of 123,000. Health services in the city are delivered through a network of six council clinics, eight private practitioners, two private hospitals, three clinics operated by uniformed forces, and one government general hospital. All public health facilities in Kadoma provide comprehensive COVID-19 prevention and treatment packages, both at the facilities and through community outreach programs. A map showing the study setting is presented in Figure 2.

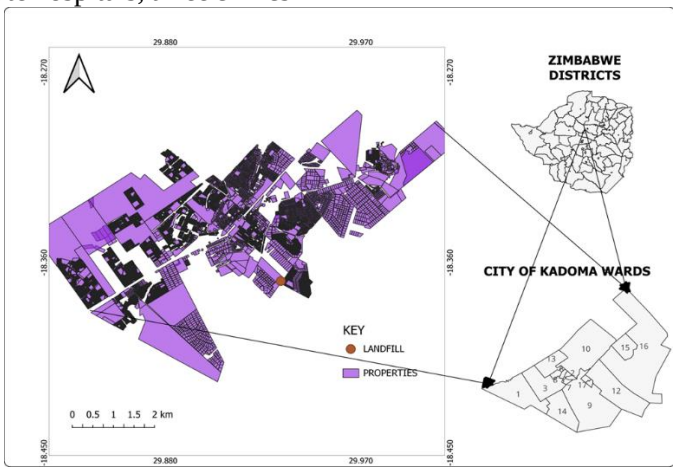

Figure 2. Map Showing Study Setting in Zimbabwe 2024 [9]

Study Population and Study Unit

The study population was residents of Kadoma City urban residing in the suburbs who were above 18 years of age. The study unit was any individual who suffered and recovered from COVID-19, identified through the line list from Health facilities distributed in the city suburbs and controls were identified in the same suburb with proximity to confirmed recovered cases.

Sample Size

The sample size was calculated using the Epi Info Stat Cal [4] based on the estimated population of Kadoma City, 123,000, with the margin of error maintained at 5%, and a confidence interval of 95%. A confidence limit of 5% was applied with a design effect of 1, recommended by the CDC, on the expected frequency of 50%, as no compliance study had been conducted. The estimated sample size was 382.

Sample Selection

The cases were identified through a consolidated COVID-19 case line list generated from Health Facilities where diagnosis was conducted during that period. Each patient on the line list was assigned a unique case number as they were entered in a database at the central office used for identification purposes. Using Excel 2017, random numbers were generated. Case numbers on the line list that matched the randomly generated numbers were recruited into the study. Controls were selected based on proximity to confirmed cases.

Data Collection and Analysis

Data were collected using a pretested interviewer-administered questionnaire. The questionnaire was developed based on existing WHO, CDC guidelines and a literature review. It contained continuous and categorical variables as well as Likert Scales. Epi Infor 7™ was used for data capture and analysis. Means, frequencies, and tables were generated. Descriptive statistics were used to describe and

synthesise data to give insight into a phenomenon under study [16].

Ethical Consideration

The study was ethically approved by the national regulatory board, the Medical Research Council of Zimbabwe. Informed consent was obtained from all respondents, and consent forms were signed. Confidentiality and anonymity of the respondents were guaranteed and communicated to research participants.

Results

Demographic Characteristics of Respondents

A total of 402 respondents were interviewed to provide information on factors affecting compliance with and adherence to public health measures to prevent COVID-19 transmission. The respondents consisted of 54% (216/402) cases and 46% (186/402) controls. The cases interviewed indicated that 93% (192/206) had suffered from COVID once, whilst 6.3% (13/206) had suffered from COVID-19 twice, and only one person had suffered from COVID-19 thrice.

Duration of Hand Washing

The proportion of respondents who washed their hands using soap and water for 20 seconds was 84% (337/402), of which 86% were amongst the cases and 82% 160/196 were amongst the controls.

Washing Hands after Touching the Face by Respondents' Sex Status

The results of washing hands after touching the face are presented in Figure 3 according to respondents' sex.

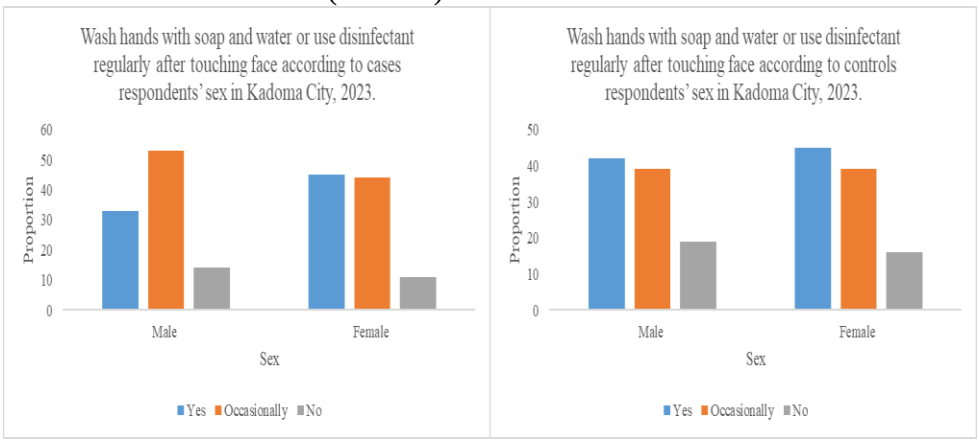

Figure 3. Wash Hands with Soap and Water or Use Disinfectant Regularly after Touching Face according to Respondents' Sex in Kadoma City, 2023

A total of 164 respondents always washed their hands with soap or used disinfectants after touching their face, out of which 38% (79/206) were amongst cases and 43% (85/196) amongst controls. A total of 177 of the total respondents washed their hands occasionally, out of which 49% (101/206) were cases and 39% (76/196) were controls ($p=0.04$). Amongst the males, 33% (37/113) of the cases and 42% (43/103) of the controls always washed hands with soap or disinfectant when they touch the face, 53% (60/113) of the cases and 39% (40/103) of the controls occasionally did so. Amongst the females, 45% (42/93) of the cases and 45% (42/93) of the controls said they washed their hands always; 44% (41/93) of the controls occasionally did, 11% (10/93) of the cases and 16% (15/93) of the controls said no.

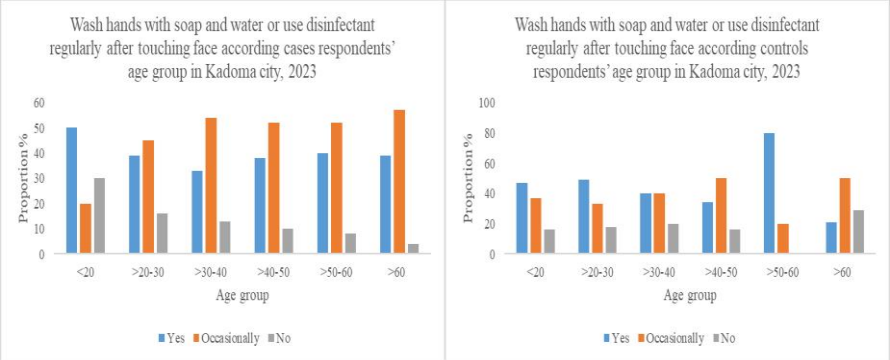

Figure 4. Wash Hands with Soap and Water or Use Disinfectant Regularly after Touching Face according to Respondents' Age Group in Kadoma City, 2023

The results of washing hands after touching the face are presented in Figure 4 according to respondents' age group.

The following were the responses according to the various age groups on the use of water and soap, or disinfectant, after touching the face. Amongst the persons between >20-30 age group, 39% (26/67) of the cases and 49% (30/61) of the controls said yes, 45% (30/67) of the cases and 33% (20/61) of the controls said occasionally. Amongst the >30-40 age group, 33% (13/39) of the cases and 40% (24/60) of the controls (*p=0.04*) said yes to the statement; 54% (21/39) of the cases and 40% (24/60) of the controls said occasionally, 13% (5/39) of the cases and 20% (12/60) of the controls said no. Amongst the >40-50 years' age group, 38% (16/42) of the cases and 34% (11/32) of the controls said yes, 52% (22/42) of the cases and 50% (16/32) of the controls said occasionally.

The following responses were given by the respondents on washing hands with water and soap or using disinfectant after touching one's face, according to employment status. As for those who were formally employed, 42% (38/90) of the cases and 36% (13/36) of the controls (*p=0.0004*) said yes to the statement; 47% (42/90) of the cases and 42% (15/36) of the controls indicated they occasionally washed hands with water and soap. According to those informally employed, 21% (6/29) of the cases and 50% (25/50) of the controls (*p=0.0002*) said yes; 69% (20/29) of the cases and 36% (18/50) of the controls said occasionally. Amongst those who were not employed, 43% (27/63) of the cases and 47% (34/73) of the controls indicated yes; 44% (28/63) of the cases and 34% (25/73) of the controls said occasionally.

Washing Hands after Touching the Surfaces by Respondents' Status

The results of washing hands after touching surfaces are presented in Figure 5 according to respondents' sex.

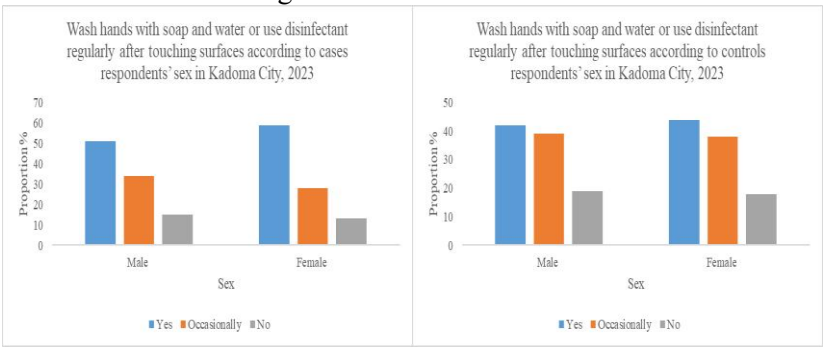

Figure 5. Wash Hands with Soap and Water or Use Disinfectant Regularly after Touching Surfaces according to Respondents' Sex in Kadoma City, 2023

A total of 197 out of the 402 respondents said they wash their hands with soap or disinfectant after touching surfaces. Amongst the total respondents, the proportion who said yes to washing hands using water and soap or disinfectant after touching surfaces was 54.6% (112/206) and 43.3% (85/196) amongst cases and controls, respectively (*p=0.03*). Washing hands with soap and water or use disinfectant after touching surfaces had the following responses from the male's respondents, 51% (58/113) of the cases and 42% (43/103) controls indicated yes; 34% (38/113) of the cases and 39% (0/103) of the controls said occasionally whilst 15% (17/113) of the cases and 19% (20/103) of the controls said no. According to female respondents, 59% (55/93) of the cases and 44% (41/93) of the controls said yes; 28% (26/93) of the cases and 38% (35/93) said occasionally whist 13% (12/93) of the cases and 18% (17 /93 of the controls said no.

The results of washing hands after touching surfaces are presented in Figure 6 according to respondents' employment status.

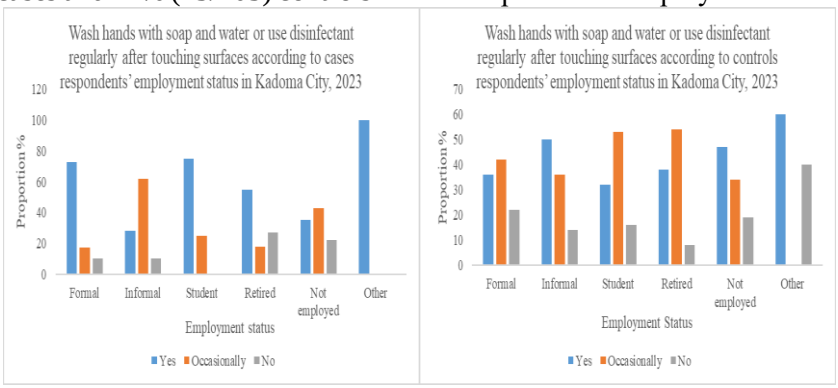

Figure 6. Wash Hands with Soap and Water or Use Disinfectant Regularly after Touching Surfaces According to Respondents' Employment Status in Kadoma City, 2023

The respondents gave the following responses on washing hands with water and soap or disinfectant after touching surfaces. Amongst the formally employed, 73% (66/90) of the cases and 36% (13/36) of the controls (*p <0.00001*) said yes; 17% (15/90) of the cases and 42% (15/36) of the controls occasionally washed their hands. As for the informally employed, 28% (8/29) of the cases and 50% (25/50) of the controls (*p = 0.001*) said yes; 62% (18/29) of the cases and 36% (18/50) of the controls occasionally did.

Hand Washing Enablers

The hygiene-enabling factors to prevent contracting *COVID-19* amongst cases and controls are presented in Table 1.

Table 1. Hygiene Enabling Factors to Prevent COVID-19 according to Respondents in Kadoma City, 2023

Enabling factors	**Cases**		**Controls**		**Odds Ratio (95% CI)**	**P Value**
	Yes %	**No %**	**Yes %**	**No %**		
Is it easy to get water for hand washing?	191 (93)	15 (7)	185 (94)	11 (6)	0.67	0.5
Is it easy to obtain soap for hand washing?	179 (87)	27 (13)	182 (93)	14 (7)	0.56	0.05
Is it difficult to obtain disinfectant for sanitising hands?	104 (50)	102 (50)	100 (51)	96 (49)	1.12	0.9

A total of 376 (94.2%) of the total respondents indicated that it was easy to get water for hand washing, with a proportion of 93% (191/206) amongst cases and 94% (185/196) amongst controls. A proportion of 87% (179/206) of the cases and 93% (182/196) of the controls (*p=0.05*) indicated it was easy to obtain soap for hand washing. On getting disinfectant for sanitising hands, a proportion of 50% (104/206) of the cases and 51% (100/196) of the controls (OR=1.12) indicated it was easy to get it.

Discussion

According to the findings of this study, responses on hand washing with water and soap for 20 seconds were above 80% for both cases and controls. In a study conducted in Zimbabwe, it was noted that participants were not used to washing hands frequently and did not follow recommended procedures during COVID-19 [12]. In a study conducted in Saudi Arabia, 91% of the respondents washed their hands with water and soap for 20 seconds [2], which is higher than the findings of this study. This finding is higher than what was found in this study. The proportion of respondents who washed their hands with soap and water for 20 seconds was 6% higher amongst the cases as compared to controls.

The findings of this study revealed that there were more respondents amongst the total case respondents (51%) as compared to total control respondents (22%) who agreed that washing hands with soap or using disinfectant reduced the chance of getting *COVID-19*. The difference in proportions was statistically significant (*p <0.00001*). Amongst the cases, 3% (6/206) and 38% (75/196) amongst controls strongly agreed that hand washing reduces chances of getting *COVID-19*; there was a statistical difference between the two proportions (*p <0.00001*). The proportion amongst those who strongly agreed that washing hands with soap or using a disinfectant reduces *COVID-19* was higher amongst the controls, 38% as compared to 3% of the cases. In a study conducted in Ethiopia, 50% of the respondents stated that handwashing would reduce transmission [5]. The married case respondents in this study had a higher proportion of 50% as compared to 9% amongst the controls who agreed that frequent hand washing with soap or disinfectant reduces *COVID-19* transmission. There was a statistical significance (*p=0.00001*) between the married case respondents and married control respondents. Amongst the respondents not employed, 59% (37/63) of cases and 29% (21/73) of the controls agreed that washing hands with water and soap or using disinfectant would reduce *COVID-19* transmission, which was statistically significant *(p=0.02*). The highest proportion of respondents who strongly agreed that washing hands with soap and water or disinfectant was amongst the controls, with 8% among the formally employed, compared to 47% amongst the cases in the same category. There was a statistical significance (*p <0.00001*) between formally employed cases and controls who agreed on hand washing.

According to the sex of respondents, this study revealed that the proportion of total respondents who occasionally washed (44%) their hands after touching their faces was higher than those who always washed their hands (41%). The proportion of those who occasionally washed their hands was higher amongst the cases, 49% as compared to controls, 39%, which was statistically significant *(p=0.04)*. The proportion of males who always washed their hands was higher amongst the cases, 53%, as compared to controls, 39%. In a study conducted in China, 82% of the respondents indicated that they washed their hands more often than usual during the *COVID-19* outbreak [10]. The study in China does not indicate circumstances for hand washing. The proportion is, however, higher than the findings of this study. It is important to point out that the proportion of

hand washing was lower than 60% for both controls and case respondents.

The findings of this study revealed that the proportion of respondents who confirmed washing hands with water and soap or using disinfectant after touching surfaces was higher amongst the case respondents, 54% as compared to 43% amongst controls, which was statistically significant *(p=0.03)*. The proportion of males who said yes to using water and soap or disinfectant after touching surfaces was higher amongst case respondents at 51% as compared to controls at 42%. Amongst the female respondents, those who said yes to using water and soap or disinfectant were higher amongst cases, 59%, as compared to controls, at 44%. In a study conducted in Bangladesh, 89% of the respondents indicated that they washed their hands with soap and water after touching various surfaces [3].

The proportion of respondents in this study who said yes to washing hands with soap and disinfectant after touching surfaces amongst the formally employed was higher amongst the cases, 73%, as compared to 36% controls, which was statistically significant *(p=0.00001)*. Amongst the informally employed, the proportion of respondents who said they washed hands hands using water and soap or disinfectant after touching surfaces was higher amongst controls (50%) compared to cases at 28%, which was statistically significant *(p=0.001)*.

In this study, getting water was easy for both respondents' cases, 93% and the control, 94%. In terms of obtaining soap for hand washing, the highest proportion was amongst the controls at 93% and cases at 87%, the difference was statistically significant (*p=0.05*) with an odds ratio of 0.56. The proportion of cases who got disinfectants (50%) was almost equal to the proportion of controls (51%) who had access to disinfectant, with an odds ratio of 1.12. In a study conducted in Sub-Saharan Africa, it was noted that the proportion of houses that had water and soap for hand washing ranged from 5% in Burundi to 64% in Angola. Rural homesteads had much lower access [8].

Conclusion

We conclude that less than 50% and slightly higher amongst respondents who complied with hand washing as a preventive measure to reduce transmission of COVID-19 in Kadoma City. The respondents had access to water and soap, enablers for handwashing, though they did not practice it. 80% of the respondents were aware of the duration of handwashing times. During such a pandemic, 50% compliance is low to quickly control the pandemic. Failure to adjust to more community members washing hands frequently could be attributed to non-commitment, poor attitude and practices, because water and soap were accessible to the respondents.

Conflict of Interest

There is no conflict of interest.

Acknowledgement

I would like to take this opportunity to appreciate everyone who contributed to the overall success of this study. I am grateful to;

1. Professor Nicholas, my supervisor for his invaluable advice and support during the study, as well as for reviewing this article.
2. Dr. Daniel Chirundu, for his experience, knowledge, guidance, and encouragement throughout my research. He also played a critical role in overseeing the data collection and entry, and the review of this article
3. The data collection and entry teams led by Mr Jenje.

References

[1]. Ajzen, 1991, Theory of Planned Behavior and Social Media Use by College Students https://www.researchgate.net/publication/272790646_The_Theory_of_Planned_Behavior

[2]. Al-Hanawi, M. K., Angawi, K., Alshareef, N., Qattan, A. M. N., Helmy, H. Z., Abudawood, Y., Alsharqi, O., 2020, Knowledge, attitude, and practice toward COVID-19 among the public in the kingdom of Saudi Arabia: a cross-sectional study. https://pubmed.ncbi.nlm.nih.gov/32574300/

[3]. Bacha, A., Begum, M., Chowdhury, F. I., Faranaj, S., Shams, T., & Hossain, A., 2021, Knowledge, Attitudes and Practices (KAP) towards COVID-19 and importance of Hand Hygiene: A Cross-Sectional Study. www.medrech.com

[4]. CDC, 2016, Epi Infor 7 User Guide. https://www.cdc.gov/epiinfo/

[5]. Desalegn, Z., Deyessa, N., Teka, B., Shiferaw, W., Hailemariam, D., Addissie, A., Abebe, T., 2021, COVID-19 and the public response: Knowledge, attitude and practice of the public in mitigating the pandemic in Addis Ababa. *Ethiopia*. https://doi.org/10.1371/journal.pone.0244780

[6]. Engdaw. G. T., Gebrehiwot, M., & Andualem, Z., 2019, Hand hygiene compliance and associated factors among health care providers in Central Gondar zone public primary hospitals, *Northwest Ethiopia.* https://pubmed.ncbi.nlm.nih.gov/31788237/

[7]. Ezezika, O., Heng, J., Fatima, K., Mohamed, A., & Barrett, K., 2023, What are the barriers and facilitators to community handwashing with water and soap? A systematic review. https://pmc.ncbi.nlm.nih.gov/articles/PMC10115288/

[8]. Jiwani, S. S., & Daniel, A. A., 2020, Inequalities in access to water and soap matter for the COVID-19 response in sub-Saharan Africa. https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-020-01199-z . February 24

[9]. Kadoma City Health GIS unit, 2024, Kadoma City Map ward boundaries.

[10]. Liu Y., Ma, Q., Liu, H., & Guo, Z., 2022, Public attitudes and influencing factors toward COVID-19 vaccination for adolescents/children: a scoping review. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8825307/pdf/main.pdf

[11]. Midzi, N., Mutsaka-Makuvaza, M. J., Charimari, L.S., Mangwiro, P., Manengureni, T., & Mugadza, G., 2024, A qualitative study of knowledge, beliefs and misinformation regarding COVID-19 in selected districts in Zimbabwe https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-20053-3

[12]. Midzi, N., Mutsaka-Makuvaza, M. J., Charimari, L. S., Mangwiro, P., Manengureni, T., & Mugadza, G., 2024, Factors affecting hand hygiene practice during the COVID-19 pandemic in the Zimbabwean population: a qualitative study. https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-024-09277-1

[13]. Muchangi, J. M., Mturi, J., Mukasa, H., Kithuki, K., Kosgei, S.J., Kanyangi, L. M., Nankanja, M., 2024, Enablers and barriers to vaccine uptake and handwashing practices to prevent and control COVID-19 in Kenya, Uganda, and Tanzania: a systematic review. https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1352787/full

[14]. Murewanhema, G., & Murewanhema, F., 2021, Drivers of the third wave of COVID-19 in Zimbabwe and challenges for control: perspectives and recommendations. https://www.panafrican-med-journal.com/content/article/40/46/pdf/46.pdf

[15]. Mutsaka-Makuvaza, M. J., Midzi, N., Charimari, L. S., Mangwiro, P., Manengureni, T., & Mugadza, G., 2024, Use of face masks for COVID-19 prevention: a qualitative study on barriers and motivators in Zimbabwe https://link.springer.com/article/10.1007/s44155-024-00083-3

[16]. Polit, D. F., & Beck, C. T., 2012, Nursing Research: Generating and Assessing Evidence for Nursing Practice. 10th Edition. Lippincott Williams and Wilkins. *New York*

[17]. White, S., Thorseth, A. H., Dreibelbis, R., & Curtis, V., 2020, The determinants of handwashing behaviour in domestic settings: An integrative systematic review.

https://www.sciencedirect.com/science/article/pii/S1438463919311101?via%3Dihub

[18]. WHO Scientific brief, 2020, Modes of transmission of virus causing COVID-19, implications for IPC precaution recommendations. https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations

[19]. WHO, 2020, Novel Coronavirus (2019-nCoV) Situation Report 1. https://apps.who.int/iris/handle/10665/330760.

[20]. WHO, 2020, Novel Coronavirus (2019-nCoV), Situation Report, 11. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200131-sitrep-11-ncov.pdf?sfvrsn=de7c0f7_4.

[21]. WHO, 2020, Coronavirus disease 2019 (COVID-19) Situation Report 52, https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200312-sitrep-52-covid-19.pdf?sfvrsn=e2bfc9c0_4

[22]. WHO, 2021, Resource considerations for investing in hand hygiene improvement in health care facilities https://www.who.int/publications/i/item/9789240025882

[23]. WHO, 2023, Considerations for implementing and adjusting public health and social measures in the context of COVID-19. https://www.who.int/publications/i/item/who-2019-ncov-adjusting-ph-measures-2023.1