

Knowledge, Attitude and Practice Towards COVID-19 Infection Prevention and Control Measures in Mwandia District of Zambia – A Three-Year Retrospective Study

Tinkler Saul Simbeye¹, Pamela Mwansa², Queen Mulenga³, Evason Mandona⁴, Esther Masebe⁵, Arthur Chisanga⁵, Remmy Mulenga⁵, Inonge Milupi Muyunda⁵, Mary Mtonga Chimwala⁵, Kennedy Mwila⁵, Dorothy Banda⁵

¹Department of Business and Management, The University of Zambia, Lusaka, Zambia

²Department of Public Health, Cavendish University, Lusaka, Zambia

³Catholic Relief Services (CRS), Provincial Health Office, Choma, Zambia

⁴Department of Public Health, Chibombo College of Health Sciences, Chibombo, Zambia

⁵Faculty of Nursing and Midwifery, Lusaka Apex Medical University, Lusaka, Zambia

Email address:

tisasi1983@gmail.com (Tinkler Saul Simbeye)

To cite this article:

Tinkler Saul Simbeye, Pamela Mwansa, Queen Mulenga, Evason Mandona, Esther Masebe, Arthur Chisanga, Remmy Mulenga, Inonge Milupi Muyunda, Mary Mtonga Chimwala, Kennedy Mwila, Dorothy Banda. Knowledge, Attitude and Practice Towards COVID-19 Infection Prevention and Control Measures in Mwandia District of Zambia – A Three-Year Retrospective Study. *International Journal of Infectious Diseases and Therapy*. Vol. 8, No. 1, 2023, pp. 31-38. doi: 10.11648/j.ijidt.20230801.14

Received: January 27, 2023; **Accepted:** February 24, 2023; **Published:** March 3, 2023

Abstract: Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which affects the upper and the lower respiratory tract system and spreads via droplet and person-to-person close contact. This study sought to determine the level of knowledge, attitude and practice of people towards COVID-19 infection prevention and control measures in order to enhance and amplify the impact of COVID-19 preventive measures in Mwandia District, in the Western Province of Zambia in Central Africa. A total of 380 patients and clients aged between 15 and 50 whose COVID-19 status was not known were selected via simple random sampling technique to participate in this study. Data was collected using structured interview questionnaire and was analyzed by Statistical Package for Social Sciences (SPSS) version 20. Tables and charts were used to present the analyzed data. The correlations between predictors and end results variables were categorized by multivariate logistic regression analysis. This study revealed that most of study participants 35.8% (136) were aged between 21 and 30 with the mean value of 2.18. The study also disclosed that most of the study participants 58.4% (222) were females while 41.6% (158) were males with mean value of 1.58. The study further disclosed that 95% (361) of the respondents had adequate level of knowledge on COVID-19 infection prevention and control measures. And age, marital status, level of education, occupation and number of children were found to have significant correlation with level of knowledge on COVID-19 infection prevention and control measures ($P < 0.05$). It also revealed that the vast majority of the respondents 92.1% (350) had good attitude towards COVID-19 infection prevention and control measures. Level of education and occupation were found to have statistically significant association with level of attitude towards covid-19 infection prevention and control measures ($P < 0.05$). The study also uncovered that 76.1% (289) of the respondents had good practice towards COVID-19 infection prevention and control measures while 23.9% (91) had poor practice towards COVID-19 infection prevention and control measures. Level of education and occupation were found to have statistically substantial association with level of practice towards covid-19 infection prevention and control measures ($P < 0.05$). However, it is recommended that there is need to raise community awareness on the importance of getting vaccinated against COVID-19 infection. There is also need for community sensitization on the importance of strict adherence to five golden rules of Covid-19 infection prevention and control measures.

Keywords: Knowledge, Attitude, Practice, COVID-19, Mwandia District, Zambia

1. Introduction

Coronavirus disease 2019 (COVID-19) is a virus which affects the upper and lower respiratory tract system and spreads via person-to-person contact. Mounting evidence also indicates that, many people especially in Sub-Saharan Africa (SSA) do not strictly adhere to the World Health Organization's put forward preventive and control measures of COVID-19 mainly due to lack of awareness and delude which in turn causes people to question the level of knowledge, attitude, and practice towards COVID-19 in the community. Without a vaccine or effective treatment, limiting the impacts of COVID-19 requires behavioral change and adherence to public health policy and regulations. Also, several studies demonstrate that efficient curbing of coronavirus disease 2019 (COVID-19) pandemic, demands sufficient comprehension of the factors that manipulate the changes in the behaviour of people towards COVID-19 infection prevention and control strategies [1].

And substantial evidence also shows that, in order to understand the epidemiological dynamics of the disease and the efficacy, compliance, and success of the infection prevention and control (IPC) measures established by World Health Organization (WHO), it is essential to understand the knowledge, attitudes, and practices (KAP) of the populace concerning COVID-19 [2].

World over, coronavirus disease 2019 (COVID-19) remains one of the worst disasters this earth has ever experienced. And evidence indicates that adequate knowledge, good attitude, and of course acceptable practice play a vital role in the prevention and control of COVID-19 infection across the globe especially if they are applied appropriately. Other than that, many recent studies have also shown that COVID-19 has emerged as one of the global public health pandemics who has continued to cause tension, depression, insomnia, untold suffering, high morbidity and mortality rates among the people in the world [3].

Other than that, World Health Organization (WHO) has put in place such staunch infection prevention and control measures as social distancing, putting on mask, sanitizing hands, and being vaccinated against COVID-19 which not only decrease the chances of being infected but also contribute to community protection (herd immunity) thus lessening the chances of the virus transmission. Also evading overcrowded places, washing hands several times, staying at home when sick, and of course seeking medical attention early so as to control and prevent the fast spread of COVID-19 infection across the globe have been recommended as well. But these measures have no impact at all on the pandemic mainly because most of the people have low level of knowledge, negative attitude and poor practice towards COVID-19 infection prevention and control measures [4].

Another study which was conducted on knowledge, attitude and practice in South Korea found that attitudes and practices such as avoiding larger crowded places, putting on personal protective equipment (PPE) and social distancing

are adversely affected by the level of knowledge among the study subjects. However, knowledge level on COVID-19 fluctuated dramatically among the participants mainly because it was determined by such socio-demographic factors as education. The study further revealed soaring level of awareness on COVID-19 infection prevention and control especially among female participants ($p < 0.05$) who had attained lofty level of education [5].

Another study was also done on COVID-19 in Sub Saharan Africa which found that most of the healthcare providers had adequate level of knowledge, acceptable level of risk perception and high levels of self-reported prevention measures. The study further disclosed that the majority of the respondents (73.7%) had self-perceived social stigma and low (6.6%) prevalence of depression as well as anxiety (6.6%) and psychological distress (18%). The study also revealed that nurses had lower level of knowledge in comparison with doctors on COVID-19 infection prevention and control measures. It also disclosed that despite health care providers exhibiting good level of knowledge on COVID-19 in Sub Saharan Africa, it was recommended that, there was need to enhance awareness and compliance towards COVID-19 infection prevention and control measures and resolve social stigma which is exerted against health care providers so as to ensure their safety which in turn will help them to deliver high quality individualized health care services to all the people in the community [6].

Other than that, according to the study which was conducted in Egypt on knowledge, attitudes, perceptions and practices disclosed that the majority (80.7%) of the respondents had adequate level of knowledge on COVID-19 infection prevention and control strategies [7]. These findings are in line with the findings of the study which was carried out in Cameroon which revealed that most (84.2%) of the respondents had adequate level of knowledge about COVID-19 infection. The study also disclosed that most (99%) of the participants had affirmative attitude towards COVID-19 infection prevention and control strategies in Egypt. However, the study also revealed that most (78.5%) of the respondents had poor practice towards COVID-19 infection prevention and control measures due to various obstacles and perception that need to be addressed in order to enhance practice among the Egyptians towards COVID-19 infection [8].

2. Methods

Retrospective and descriptive cross sectional studies were used to determine knowledge, attitude and practice of people aged between 15 and 50 towards COVID-19 infection prevention and control measures from 2019 to 2021 in Mwanzi district of Zambia. This study assessed knowledge, attitude and practice of people regarding COVID-19 infection prevention and control measures in certain health facilities in Mwanzi district. The study was conducted in certain clinics with larger populations that were chosen from a total of 10 clinics using simple random sampling technique.

These clinics had same attributes across the district and the study participants comprised of educated and non-educated people, from low and high socioeconomic status and had both genders. It also comprised of people who were in formal employment, informal employment and those who were not in any employment which fully represented the study population. Ethical approval was gotten from Mwanzi District Health Office and Mwanzi Mission Hospital respectively. Each and every gathered data from the study participants was kept under strict confidentiality and no identity of the respondents such as their names, phone numbers, IDs or their places of origin appeared on the questionnaires so as to uphold privacy, promote cooperation and confidence among them. The study's purpose was also communicated to every study participant in order to promote understanding among the people about the study in which they were taking part. Also informed consent was gotten from the study participants before data collection exercise commenced.

Structured interview questionnaires were utilized for collecting the required data from randomly selected study participants in health facilities by holding one on one interviews with them. The data collection tool was basically evaluated by three investigators and their contributions were included in the ultimate questionnaire. The collected data was analyzed using Statistical Package for Social Sciences (SPSS version 20) and tables and charts were used to present the analyzed data. Also correlations between predictors and end results variables were categorized by multivariate logistic regression analysis. Study population encompassed all people aged between 15 and 50 coming to seek health services in health facilities from different communities. All study participants were selected by simple random sampling criteria which accorded every research respondent equivalent prospect to be chosen as a participant to take part in the research. The total sample size for this study was 380 taking into consideration such critical aspects as acceptable margin of error at 5%, Level of confidence at 95%, response distribution at 50% and size of the population for Mwanzi District was 29451. Pilot study was conducted at Mwanzi Mission Hospital. Therefore, Mwanzi Mission Hospital was not part and parcel of the final study so as to evade bias.

3. Results

A good proportion of study participants 35.8% (136) were aged between 21 and 30 with the mean value of 2.18. Also, the study revealed that the majority of the respondents 58.4% (222) were females while 41.6% (158) were males with mean value of 1.58. Apart from that, a huge number of the respondents 62.6% (238) were single while 29.2% (111) were married with the mean value of 1.51. The study also disclosed that, a good number of the respondents 43.9% (187) had accomplished secondary level of education while 35.3% (134) had attained primary level of education with mean value of 2.72. The study also disclosed that most of the respondents 88.9% (338) were Christians while 8.2% (31)

were Muslims. Also the study disclosed that the vast majority of the study participants 68.4% (260) were unemployed while 23.9% (91) were in informal employment. The study also uncovered that most of the respondents 48.2% (183) belonged to the lower social class while 41.8% (159) belonged to the middle social class.

Table 1. DEMOGRAPHIC DATA (n=380).

Variable	Frequency (n)	Percentage %
SEX		
MALE	158	41.6%
FEMALE	222	58.4%
TOTAL	380	100%
AGE		
15-20	115	30.3%
21-30	136	35.8%
31-40	71	18.7%
41-49	58	15.3%
TOTAL	380	100%
MARITAL STATUS		
SINGLE	238	62.6%
MARRIED	111	29.2%
DIVORCED	16	4.2%
WIDOWED	9	2.4%
SEPARATED	6	1.6%
TOTAL	380	100%
SOCIAL CLASS		
UPPER CLASS	38	10%
MIDDLE CLASS	159	41.8%
LOWER CLASS	183	48.2%
TOTAL	380	100%
RELIGION		
CHRISTIAN	338	88.9%
MUSLIM	31	8.2%
OTHERS	11	2.9%
TOTAL	380	100%
LEVEL OF EDUCATION		
NONE	17	4.5%
PRIMARY	134	35.3%
SECONDARY	167	43.9%
TERTIARY	62	16.3%
TOTAL	380	100%
OCCUPATION		
UNEMPLOYED	260	68.4%
INFORMAL EMPLOYMENT	91	23.9%
FORMAL EMPLOYMENT	29	7.6%
TOTAL	380	100%
NUMBER OF CHILDREN		
NONE	93	24.5%
ONE	112	29.5%
TWO	53	13.9%
THREE	48	12.6%
FOUR	30	7.9%
FIVE	23	6.1%
SIX	14	3.7%
MORE THAN SIX	7	1.8%
TOTAL	380	100%

Table 2 shows that, the vast majority of the respondents 95% (361) had adequate level of knowledge on COVID-19 infection prevention and controls measures while 5% (19) of the respondents had inadequate level of knowledge on COVID-19 infection prevention and controls measures in Mwanzi District of Zambia.

Table 2. Level of Knowledge of People on COVID-19.

PARTICIPANT'S LEVEL OF KNOWLEDGE ON COVID-19	FREQUENCY	PERCENTAGE
ADEQUATE	361	95%
INADEQUATE	19	5%
TOTAL	380	100%

Figure 1 below demonstrates that most of the respondents 92.1% (350) had good attitude towards COVID-19 infection prevention and controls measures in Mwanzi District of Zambia.

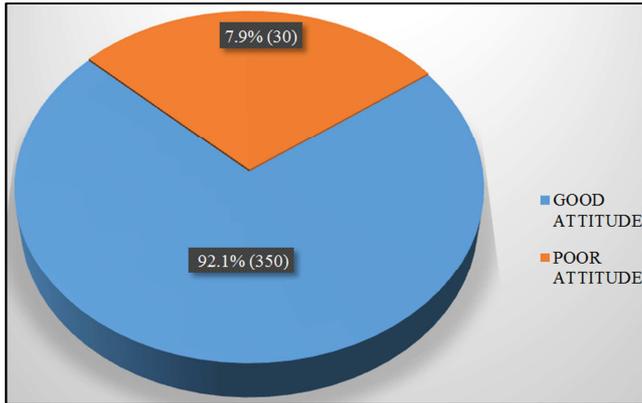


Figure 1. LEVEL OF ATTITUDE OF PEOPLE TOWARDS COVID-19.

Table 3 shows that the majority of the respondents 76.1% (289) had good practice towards COVID-19 infection prevention and controls measures while 23.9% (91) had poor practice towards COVID-19 infection prevention and control strategies in Mwanzi District, in the Western Province of Zambia.

Table 3. LEVEL OF PRACTICE OF PEOPLE ON COVID-19.

PARTICIPANT'S LEVEL OF PRACTICE ON COVID-19	FREQUENCY	PERCENTAGE (%)
GOOD PRACTICE	289	76.1%
POOR PRACTICE	91	23.9%
TOTAL	380	100%

Association Between Respondent's Level of Knowledge and Socio-Demographic Variables Is Shown in Table 4

The relationship between the level of knowledge and socio-demographic variables of the respondents is well illustrated in table 4. Age, marital status, level of education, occupation and number of children were found to have statistically significant correlation with level of knowledge on COVID-19 infection prevention and control measures ($P < 0.05$).

Table 4. Chi-Square analysis demonstrating an association between level of knowledge and socio-demographic characteristics of the respondents.

SOCIO-DEMOGRAPHIC VARIABLES	χ^2 value	Df	p value
Sex	24.546	5	0.214
Age	26.614	4	0.000 **
Marital status	26.446	6	0.001 **
Social class	28.423	5	0.513
Religion	3.354	2	0.342

SOCIO-DEMOGRAPHIC VARIABLES	χ^2 value	Df	p value
Level of Education	25.385	3	0.000 **
Occupation	26.526	5	0.000 **
Number of children	23.465	6	0.002 **

**Significant at $P < 0.05$

Association Between Respondents' Level of Attitude and Socio-Demographic Variables Is Shown in Table 5

The relationship between level of attitude and socio-demographic variables of the study participants is shown in table 5. Level of education and occupation were found to have statistically significant correlation with level of attitude towards covid-19 infection prevention and control measures ($P < 0.05$).

Table 5. Chi-Square analysis demonstrating an association between respondents' level of attitude towards covid-19 infection prevention and control measures and socio-demographic characteristics of the respondents.

SOCIO-DEMOGRAPHIC VARIABLES	χ^2 value	Df	p value
Sex	25.423	4	0.315
Age	21.422	6	0.415
Marital status	26.516	4	0.315
Social class	24.351	6	0.611
Religion	12.536	6	0.342
Level of Education	21.542	5	0.011 **
Occupation	23.614	4	0.010 **
Number of children	21.424	3	0.522

**Significant at $P < 0.05$

Association Between Respondents' Level of Practice and Socio-Demographic Variables Is Shown in Table 6

The relationship between level of practice and socio-demographic variables of the study participants is shown in table 6. Level of education and occupation were found to have statistically significant correlation with level of practice towards covid-19 infection prevention and control measures in Mwanzi District, in the Western Province of Zambia ($P < 0.05$).

Table 6. Chi-Square analysis demonstrating an association between respondents' level of attitude towards covid-19 infection prevention and control measures and socio-demographic characteristics of the respondents.

SOCIO-DEMOGRAPHIC VARIABLES	χ^2 value	Df	p value
Sex	24.261	3	0.461
Age	24.613	5	0.514
Marital status	23.541	4	0.153
Social class	25.261	6	0.214
Religion	14.530	3	0.413
Level of Education	24.542	5	0.000 **
Occupation	23.163	5	0.001 **
Number of children	23.417	4	0.215

**Significant at $P < 0.05$.

4. Discussion

Demographic data shows that a large proportion of study participants 35.8% (136) were aged between 21 and 30 with

the mean value of 2.18. Other than that, the study also revealed that the majority of the respondents 58.4% (222) were females while 41.6% (158) were males with mean value of 1.58. Moreover, a significant portion of respondents 62.6% (238) were single compared to 29.2% (111) who were married with a mean value of 1.51. The study also showed that a sizable portion of the respondents, 43.9% (187), had completed secondary level of education while 35.3% (134), with a mean value of 2.72, had completed primary level of education.

In addition, the findings in table 2 indicate that the vast majority of the respondents 95% (361) had adequate level of knowledge on COVID-19 infection prevention and control measures while 5% (19) of the respondents had inadequate level of knowledge on COVID-19 infection prevention and control strategies. Adequate level of knowledge among the study participants on COVID-19 infection prevention and control strategies was due to massive community sensitization and community engagement on the dangers of COVID-19 in the community. And age, marital status, level of education, occupation and number of children were found to have statistically significant correlation with level of knowledge on COVID-19 infection prevention and control measures ($P < 0.05$). These findings are similar to the findings from the study which was conducted in China which disclosed that, the majority of the respondents (91.5%) had adequate level of knowledge on COVID-19 infection prevention and control measures. The study also revealed that many of the respondents (98%) demonstrated positive attitudes regarding COVID-19 infection prevention and control measures in China. The study also uncovered good practice (96.8%) among the Chinese respondents on COVID-19 infection prevention and control measures. The high level of knowledge on COVID-19 among the Chinese study participants was strongly associated with level of education, marital status, place of residence and of course occupation [9].

The findings of the current study are also in line with the findings from the study which was carried out in Bangladesh which disclosed that 48.3% of study subjects had acceptable level of knowledge on COVID-19 infection prevention and control measures. Apart from that, the author also found that 62.3% of study participants had affirmative attitudes towards COVID-19 infection prevention and control measures. It also revealed that 55.1% of the study subjects had good practice concerning COVID-19 infection prevention and control strategies put in place by World Health Organization (WHO) and Ministry of Health in Bangladesh [10]. These findings are also related to Yang et al's study which disclosed that the majority (85.2%) of the participants had adequate level of knowledge on COVID-19 infection prevention and control measures which the people's republic of china and World Health Organization had put in place in order to prevent, control and reverse the fast spread of coronavirus disease 2019 (COVID-19) in China. Of equal importance is the fact that, almost all (92.9%) of the respondents had positive attitude on COVID-19 infection prevention and control

measures. Also the author found that 84.4% of the participants had good practice towards COVID-19 infection prevention and control strategies in peoples' republic of China [11]. The findings from this study are also in line with the findings from the study which was conducted in Vietnam which found that the majority of the health care workers had acceptable level of knowledge (91.3%) on COVID-19 infection, prevention and control measures which helped them to reverse, prevent and control coronavirus 2019 infection. The study also disclosed that most of the respondents had affirmative attitude toward COVID-19 preventive strategies and that 83.1% of study participants had proper practice concerning COVID-19 infection prevention and control measures [12]. The findings from this study are also related to the findings from the study which was conducted in Bosnia and Herzegovina which found that the vast majority of the respondents had adequate level (78.5%) of knowledge towards COVID-19 infection prevention and control measures. The study also disclosed that almost all (90.9%) of the respondents had good attitude towards COVID-19 infection prevention and control measures that had been put in place by World Health Organization and Ministry of health in order to limit the spread of COVID-19 among the people in Bosnia and Herzegovina. The author also found that most of the study participants (86.9%) had good practice towards COVID-19 infection prevention and control measures [13].

Moreover, the findings in figure 1 demonstrate that most of the respondents 92.1% (350) had good attitude towards COVID-19 infection prevention and controls measures. Good attitude towards COVID-19 infection prevention and control measures among the study subjects is largely due to extensive community sensitization on COVID-19, massive community engagement in COVID-19 infection prevention and control strategies, and strict adherence to the World Health Organization's COVID-19 infection prevention and control measures. Level of education and occupation were found to have statistically significant correlation with level of attitude towards covid-19 infection prevention and control measures ($P < 0.05$). These findings are similar to a study which was conducted on Knowledge, attitudes and practices towards COVID-19 in Nepal which found that the majority of the study subjects had good level of knowledge, adequate practices and attitudes towards COVID-19 infection prevention and control measures. The study also found that Knowledge, attitudes and practices towards COVID-19 among the people in Nepal were adequate even though they were squat in comparison to other countries across the globe. Therefore, the author did recommend that there was need to educate the people on the preventive and control measures of COVID-19 so as to enhance responsiveness among the people in Nepal towards COVID-19 [14]. Also, the findings from the current study are in line with the findings from the study on knowledge, attitude and practice on COVID-19 infection prevention and practice conducted in Saudi Arabia which found that most of the study participants had acceptable level of knowledge, good attitude and acceptable

level of practices towards coronavirus 2019 infection prevention and control measures that the World Health Organization (WHO) and Ministry of health in Saudi Arabia had put in place in order to control the fast and wide spread of COVID-19 [15].

Other than that, these findings are also similar to the findings from the study which was conducted on knowledge, attitudes and practices of the people in Malaysia towards COVID-19 which found that 80.5% of study subjects were knowledgeable on COVID-19 infection prevention and control measures. The study also revealed that 83.1% of study participants had good attitudes and perception toward the prevention and control strategies of COVID-19 infection in Malaysia. The study further disclosed that 85.6% of the study participants had good practices among the Malaysian people towards COVID-19 infection prevention and control strategies. Nonetheless, the study found that there were few Malaysians who were putting on such personal protective equipment (PPE) as mask [16]. The findings from the current study are also in line with the findings from an epidemiological survey done by Reuben et al on knowledge, attitude and practices on COVID-19 amid Nigerians who reside in the north central of Nigeria which found that the majority (99.5%) of the study participants had good level of knowledge on COVID-19 which was acquired via various social media. Other than that, the study also disclosed that, most of the study subjects (79.5%) had affirmative attitude on the COVID-19 infection prevention and control strategies put in place by the World Health Organization (WHO) and Ministry of Health in Nigeria. Interestingly, 92.7% of study participants were found to be exercising social distance and 96.4% of the respondents were also noticed to be washing their hands frequently with soap under running water and applying hand sanitizer correctly. Also most (82.3%) of the respondents were wearing the face masks as recommended by the World Health Organization (WHO) in order to reduce the wide spread of COVID-19 infection and its impact across the globe [17].

In addition, the findings in Table 3 show that the majority of the respondents 76.1% (289) had good practice towards COVID-19 infection prevention and control measures. Level of education and occupation were found to have statistically significant association with level of practice towards covid-19 infection prevention and control measures in Mwandia District, in the Western Province of Zambia ($P < 0.05$). These results are similar to the results from the study which was carried out on the knowledge, attitude and practice on COVID-19 among the people in Iran which disclosed that, the majority (90%) of the participants had adequate level of knowledge on COVID-19 infection prevention and control in Iran. Other than that, the study further revealed that, the vast majority (90%) of the respondents had good attitude towards COVID-19 infection prevention and control strategies. Apart from that, the study also disclosed that most (89%) of the study subjects had good practice on COVID-19 infection. Also, there was rigorous association among female participants, older people and people who had attained high

level of education with knowledge, attitude and practice towards COVID-19 [18]. Not only that, the findings from this study are also similar to the study which was conducted on knowledge, attitude and practice on COVID-19 in Lebanon which disclosed that most (67.1%) of the participants had suitable level of knowledge on COVID-19. The author also found that the majority (90%) of the respondents had an affirmative attitude towards COVID-19. Also the study did reveal that most (75%) of the respondents had acceptable practice on COVID-19 evidenced by the fact that, these people were able to avoid over crowded places and applied sanitizer on their hands. These are primarily attributable to the effective implementation of COVID-19 infection prevention and control measures, as well as the successful public health programs run by the Ministry of Health and working partners on Lebanon's COVID-19 containment, management, control, and prevention [19].

The results from this study are also similar to Chawe's et al study on the attitudes, knowledge, and practices of medical laboratory personnel in Zambia which discovered that most of the respondents had good level of knowledge (84.1%) and practice (75%) on COVID-19 infection of COVID-19. Higher levels of education achieved and earlier COVID-19-related training among study subjects were ascribed to their good level of knowledge and practice. However, in order to guarantee that medical laboratory personnel were knowledgeable about best practices to help contain the COVID-19 pandemic, the author did urge the necessity for continuous professional development (CPD) [20].

Nonetheless, the findings from this study are not similar to the findings from the study which was conducted on knowledge, attitude and practices on COVID-19 in Ethiopia which uncovered poor (48.7%) level of knowledge and poor (41.7%) level of practice among the study participants. The poor level of knowledge among the study participants on COVID-19 infection prevention and control was strongly correlated with illiteracy ($P < 0.046$). The study further revealed that poor level of knowledge negatively impacted on the practices and attitudes of the study participants. Poor practices among the study subjects towards COVID-19 infection prevention and control strategies was also due to low level of knowledge, history of having travelled and low level of education. The author did recommend that there was need to educate illiterate people, people with history of having travelled, people with contact history and underprivileged people on how COVID-19 is spread, how it can be managed in the event that someone contracts it and how it can be prevented in order to enhance the level of knowledge, attitude and practice among them towards COVID-19 infection prevention and control strategies [21]. In addition, another study was carried out on the level of knowledge, attitude and practices of the people towards COVID-19 infection prevention and control in Sub Saharan Africa which found that, the majority (80.2%) of study participants were knowledgeable on COVID-19 infection. However, they had poor attitude and practices towards COVID-19 infection prevention and control strategies due to

illiteracy levels [22].

Not only that, these findings are also not in line with Nwagbara et al's findings from the study which was carried out in Sub Saharan Africa (SSA). Even though the study showed high prevalence of knowledge related to COVID-19 in all participants included in the studies, there was a significant gap in the level of attitude and practice towards COVID-19 in Sub Saharan Africa (SSA), suggesting that interventions should go beyond just knowledge, but begin to positively affect attitudes and ultimately practices. Therefore, it is important to strengthen health education, information broadcasting, and awareness on the knowledge, attitude, and practice of COVID-19 to slow down this pandemic. The author recommended that there was also a need to make available enough personal protective equipment (PPE) to health care workers, raise their awareness on infection prevention and control in health facilities in Sub Saharan Africa and employ interventions that improve the community's knowledge, attitude, and practice towards COVID-19 prevention as well [23].

5. Limitations of the Study

The small sample size which was used in the study drastically limits the generalization of the findings to other parts of the country. Also inadequate human resources, material resources, and financial resources did hinder the researcher from using a bigger sample size in that they could not travel long distances to go and collect data in many health facilities. Not only that, limited time also prevented the researcher from conducting a larger study on a wider scale.

6. Conclusion

All in all, the study disclosed that about 95% (361) of the respondents had adequate level of knowledge on COVID-19 infection prevention and controls measures. Adequate level of knowledge among study participants on COVID-19 infection prevention and control strategies was mainly due to massive community sensitization on COVID-19 infection, prevention and control measures. It was also due to extensive community engagement of traditional healers, community based volunteers (CBVs), community health workers, Village headmen, businessmen, politicians, faith based leaders, traditional leaders (chiefs), headmasters, teachers, adherence supporters, and members of district level COVID-19 task forces in the COVID-19 infection prevention and control strategies. And age, marital status, level of education, occupation and number of children were significantly correlated with level of knowledge on COVID-19 infection prevention and control measures ($P<0.05$). Also it revealed that most of the respondents 92.1% (350) had good attitude towards COVID-19 infection prevention and controls measures. Good attitude towards COVID-19 infection prevention and control measures among the study subjects was largely due to extensive community sensitization on

COVID-19 infection, massive community engagement in COVID-19 infection prevention and control strategies, good planning, and strict adherence to the World Health Organization's COVID-19 infection prevention and control measures. Level of education and occupation were found to have statistically significant association with level of attitude towards covid-19 infection prevention and control measures ($P<0.05$).

Other than that, the study uncovered that the vast majority of the respondents 76.1% (289) had good practice towards COVID-19 infection prevention and controls measures. Good practice towards COVID-19 infection prevention and control measures was mainly due to extensive community sensitization, massive community engagement in COVID-19 infection prevention and control strategies, sound risk communication, and strict adherence to the World Health Organization's COVID-19 infection prevention and control measures. Level of education and occupation were significantly associated with level of practice towards covid-19 infection prevention and control measures in Mwandu District, in the Western Province of Zambia ($P<0.05$). However, the researcher strongly recommends that there is need to raise massive community awareness on the importance of getting vaccinated against COVID-19 infection in order to enhance herd immunity among the people in the community. Extensive community awareness through health education should be intensified because it will assist in reaching out to everyone such as prisoners, people in congregate settings, the elderly people, people with underlying health conditions, COVID-19 hotspot areas like markets and schools, such vulnerable groups as people with disabilities, refugees, mobile communities, cross-border traders and people in fishing camps; people in hard-to-reach areas, frontline health workers, youths as well as school going children who may not have received full doses of COVID-19 vaccine. There is also need for community sensitization on the importance of strict adherence to five golden rules of Covid-19 infection prevention and control measures. This will also assist in enhancing knowledge, attitude, and practice towards COVID-19 infection prevention and control measures among the people in the community in Mwandu District of Zambia. It is also recommended that further research is needed to understand the impact of COVID-19 preventive and control strategies on the prevention and control of other communicable diseases in Zambia and beyond. Moreover, it is strongly recommended that World Health Organization (WHO), Center for Disease Control and Prevention (CDC), and Ministry of Health in Zambia should continue capacity building of frontline healthcare providers in infection prevention and control measures at community, national and global levels.

References

- [1] Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., Zhao, X., Huang, B., Shi, W., Lu, R. (2020). A novel coronavirus from patients with pneumonia in China. *Journal of Medicine*, 382 (8), 727–33.

- [2] Monash University. (2021). COVID-19 knowledge, attitude and behavior survey. Retrieved July 20, 2021 from <https://www.monash.edu/medicine/sphpm/mchri/research/covid-19-knowledge-attitude-and-behaviours-survey-results>
- [3] Li, Y., Liu, G., Egolet, O. R., Yang, R., Huang, Y., & Zheng, Z. (2020). Knowledge, attitudes and practices related to COVID-19 among Malawi adults: A community Based Survey. *International journal of environmental research and public health*, 18 (8), 72-103.
- [4] Maude, R. R., Jongdeepaisal, M., & Skuntaniyom, S. (2021). Knowledge, attitudes and practice to prevent COVID-19 transmission in healthcare workers and the public in Thailand. *MBJ Public Health*, 21 (1), 749. <https://doi.org/10.1186/s12889-021-10768-y>
- [5] Lee, M., Kang, B. A. & You, M. (2021). Knowledge, attitudes, and practices (KAP) toward COVID-19: a cross-sectional study in South Korea. *BMC Public Health*, 295 (21), 26-24.
- [6] Assefa, N., Soura, A., Hemler, C. E., Korte, L. M., Wang, D., Abdullahi, Y. Y., Lankoande, B., Millogo, O., Chukwu, A., Workneh, F., Sie, A., Berhane, y., Baernighausen, T., Oduala, A. & Fawzi, W. (2021). Covid-19 knowledge, perception, preventive measures, stigma and mental health among healthcare workers in three Sub Saharan African countries. *The American Journal of Tropical Medicine and Hygiene*, 1 (1), P. 1-9. <https://doi.org/10.4269/ajtmh.20-1621>
- [7] Doaa, I., Omar, & Amer, A. S. (2021). Egyptians Publics knowledge, attitudes, perceptions and practices toward COVID-19 infection and their determinants: A cross-Sectional Study. *Macedonian Journal of Medical Sciences*, 9 (1), 250-259.
- [8] Ngwewondo, A., Nkengazong, L., Ambe, L. A., Ebogo, J. T., Mba, F. M., & Goni, H. (2020). Knowledge, attitudes and practices towards COVID-19 preventive measures and symptoms: A cross sectional study during the exponential rise of the outbreak in Cameroon. *PLoS Negl Trop Dis*, 14 (9), 123-128. <https://doi.org/10.1371/journal.pntd.0008700>
- [9] Gao, H., Hu, R., Yin, L., Yuan, Xiaoli., Tang, Hao., Luo, Lan., Chen, Mei., Huang, D., Wang, Y., Yu, A., & Jiang, Z. (2020). Knowledge, attitudes and practices of the Chinese public with respect to coronavirus disease (COVID-19): an online cross sectional survey. *BMC Public Health*, 1816. <https://doi.org/10.1186/s12889-020-09961-2>
- [10] Ferdous, Z., Islam, S., Skder, T., Mosaddek, S. A., Gozal, D. & Valdivia, Z. a. j. (2020). Knowledge, attitude and practices regarding COVID-19 outbreak in Bangladesh: An online-based cross sectional study. *PLoS ONE*, 15 (10). 1-17. <https://doi.org/10.1371/journal.pone.0239254>
- [11] Yang, K., Liu, H., Ma, L., Wang, S., Tian, Y., Zhang, F., Li, Z., Song, Y., & Jiang, X. (2020). Knowledge, attitude and practice of residents in the prevention and control of COVID-19: An online questionnaire survey. *John Wiley and sons limited*, 77 (1), 1839-1855.
- [12] Tien, Q. T., Hanh-Tuyet. T. T., Linh, Quy. N. T., Phuc, H. H., & Nhu, V. H. (2021). Knowledge, Attitudes, and Practices Regarding COVID-19 prevention among Vietnamese Healthcare Workers in 2020. *Sage journal*, 9 (1), 1-7.
- [13] Sljivo, A., Kacamakovic, M., Sirucic, I., Mujicic, E., & Kulenovic, D. A. (2021). Knowledge, attitudes, and practices towards COVID-19 among residents of Bosnia and Herzegovina during the first stage of COVID-19 outbreak. *Medicina preventiva e di comunita*, 33 (4), 371-380.
- [14] Paudel, S., Shrestha, P., Karmacharya, I., & Pathak, K. O. (2020). Knowledge, attitudes and practices towards COVID-19 among the Nepalese residents during the COVID-19 outbreak: An online cross-sectional study. *BMC public health*, 1 (1), 1-24.
- [15] Alrasheedy, A. A., Godman, B., Alsahali, S., Farooqui, M., & Abdulsalim, S. (2021). Knowledge, attitude and practice about coronavirus disease pandemic and its psychological impact on students and their studies: A cross-sectional study among pharmacy studies in Saudi Arabia. *Journal of risk management and healthcare policy*, 14 (1), 729-741.
- [16] Azlan, A. A., Hamzah, R. M., Sem, J. T., & Ayub, H. S. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS One journal*, 15 (15), 1-15.
- [17] Reuben, C. R., Danladi, M. A. M., Saleh, A. D., & Ejembi, E. P. (2021). Knowledge, Attitudes and Practices towards COVID-19: An Epidemiological Survey in North-Central Nigeria, *Journal of Community Health*, 46 (1), 457-470. <https://doi.org/10.1007/s10900-020-00881-1>
- [18] Erfani, A., Shahriarad, R., Mirahmadizadeh, A., & Moghadami, M. (2020). Knowledge, Attitude and practice toward the Novel Coronavirus outbreak: A population Based Survey in Iran. *E-Pub*, 11 (1), 1-23.
- [19] Sakr, S., Ghaddar, A., Sheet, I., Eid, H. A., & Hamam, B., (2021). Knowledge, attitude and practices related to COVID-19 among young Lebanese population. *BMC Public Health*, 21 (653), 1-11.
- [20] Chawe, A, Mfune, R. L., Syapiila, P. M., Zimba, S. D., Vlahakis, P. A., Mwale, S., Mwape, K., Chirambo-Kaloleksha, M., Chileshe, M., Mutale, J., Mudenda, T., Manda, G., Daka, V. (2021). Knowledge, attitude and practices of COVID-19 among medical laboratory professionals in Zambia. *Afr J Lab Med*, 10 (1), <https://doi.org/10.4102/ajlm.v10i1.1403>
- [21] Gebretsadik, D., Gebremichael, S., & Belete, M. A. (2021). Knowledge, Attitude and Practice toward COVID-19 Pandemic among Population Visiting Dessie Health Center for COVID-19 Screening in Northeast Ethiopia. *Infect Drug Resist journal*, 14 (1), 905-915.
- [22] Cliff, A. (2020). Knowledge, attitudes and practices towards COVID-19 infection. *International journal of infectious diseases*, 12 (1), 72-74.
- [23] Nwagbara, U. I., Osual, E. C., Chireshe, R., Bolarinwa, O. A., Saeed, B. Q., Khuzwayo, N. (2021). Knowledge, attitude, perception, and preventative practices towards COVID-19 in sub-Saharan Africa: A scoping review. *PLoS ONE*, 16 (4). <https://doi.org/10.1371/journal.pone.0249853>