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Preparedness for COVID-19 by Primary Healthcare Workers in Rivers State, Nigeria: Facility Cross-sectional Survey

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Abstract

Introduction: The primary healthcare workers (PHCWs) face a higher risk of infection associated with their occupation, due to inadequate supplies of personal protective equipment (PPE), inappropriate use of PPEs, and insufficient knowledge on infection prevention and control. Therefore, this study aimed to assess the preparedness for COVID-19 by PHCWs in Rivers State, Nigeria.

Method: A cross-sectional survey was conducted involving the healthcare workers at the public primary healthcare facilities across the 23 local government areas (LGAs) of Rivers State, Nigeria. The descriptive statistics of mean ± standard deviation and percentage were used to present quantitative and categorical variables respectively. The preparedness for COVID-19 was measured by knowledge, attitude and preventive practices (KAP) towards the disease. The association between the KAP and demographic characteristics was tested with the Chi-square test, while the associations existing among the KAP constituents were evaluated with the Pearson correlation coefficient. Statistical significance was evaluated at $P<0.05$.

Results: Out of 460 questionnaires distributed, 412 respondents participated in the survey, indicating a response rate of 89.6%. The proportion of respondents with good scores in knowledge, attitude, and COVID-19 related practices was 86.4% (10.66 ± 2.40), 85.0% (8.28 ± 1.94), and 97.3% (8.34 ± 1.39) respectively. Gender, occupation, and years of experience were associated with knowledge, while years of experience and marital status were associated with attitude and preventive practices. Knowledge score also had significant positive linear associations with both attitudes and practices (scores toward COVID-19.

Conclusion: Our findings revealed the level of PHCWs preparedness to fight COVID-19 in Rivers State. We suggest that public health education programs on infection prevention and control should be sustained. Furthermore, training should be tailored to meet the peculiarities of the different categories of healthcare workers and years of practice.

Introduction

The novel Coronavirus disease 2019 (COVID–19) is a new respiratory disease that was reported first in Wuhan, China in December 2019 [1]. it was declared a pandemic by the World Health Organisation (WHO) on 12th March 2020 [2, 3]. The disease as of July 21, 2020, has affected more than 215 countries with 14,684,741 confirmed cases and 610,110 deaths. The symptoms of the disease include fever, dry cough, fatigue, myalgia, and dyspnea [4].

In Nigeria, the first case of COVID–19 was reported in Lagos on February 27, 2020 [5]. There has been a rapid rise in the number of confirmed cases and deaths. By July 21, 2020, the confirmed cases of COVID–19 reported by the National Center for Disease Control (NCDC) stood at 37,225 with 801 deaths and

15,333 recoveries [6]. Nigeria has the fourth-largest fatality in Africa after South Africa, Egypt, and Algeria [2].

The spread of COVID–19 to many countries has impacted the lives of different populations including healthcare workers. Healthcare workers are affected directly by the pandemic when they contract the disease and indirectly when they have to cope with infected family members. The implication of these is grave for the healthcare system as productive man-hours are lost due to absenteeism from work. Health care workers (HCWs) are also faced with a barrage of challenges like a significant risk of exposure and outbreaks in the workplace, stress, increased workload, and violence [7]. According to NCDC, more than 812 healthcare workers were infected with COVID–19 as of June 2, 2020. [8], this figure is expected to rise as the number of confirmed cases increases. Hence the need for health care workers to adhere to IPC guidelines when attending to clients.

Rivers State is one of the high burden areas of COVID–19 in Nigeria. As of July 21, 2020, the State has recorded 1,535 confirmed cases with 49 deaths [6]. In view of its cosmopolitan nature, this number is expected to rise unless precautionary measures put in place by health institutions and government are adhered to. The State is currently in the community transmission phase and this has the potential to cause fear and panic among the health workers. This may lead to the collapse of the already fragile health system. This may be compounded if the primary health care workers do not have an uninterrupted supply of personal protective equipment (PPE) and elaborate training on infection prevention and control.

According to McEachan and others, the knowledge of disease affects the attitudes and preventive practices of the population in curtailing the spread of the disease [9]. Therefore, this study aimed to assess the preparedness of PHCWs' in term of their knowledge, attitudes, and preventive practices (KAP) for COVID–19 in Rivers State, Nigeria.

Methods

Study design and population of the study

A cross-sectional survey study design was conducted among healthcare workers in public primary healthcare facilities (PHFs) across the 23 local government areas (LGAs) of Rivers State, Nigeria.

Sample size and sampling techniques

The minimum sample size for this study was 363 based on the following assumptions (study population of 6500, 95% confidence level, and 5% level of precision) using an online sample size calculator. But the number was increased to 460 to accommodate non-response and invalid responses. Twenty questionnaires each was distributed to the 23 LGAs. Four health facilities were selected by simple random sampling from a list of facilities in each LGA, making it a total of 92 PHFs. Similarly, we

randomly selected five respondents from each of the four facilities, among the healthcare workers at the facilities on the day of the survey

Data collection

Data for the study was collected from PHCWs across the 23 LGAs of Rivers State from 20th to 29th June 2020 by administering the questionnaire, adapted from the World Health Organisation (WHO) questionnaire on detection, prevention, response, and control of COVID–19 [10]. The questionnaire was divided into two parts: demographics and preparedness. The demographic characteristics were gender, age, marital status, occupation, educational level, local government. area, and years of experience. The preparedness was measured with KAP. The KAP part has 16 questions relating to knowledge, 13 relating to attitude, and 9 questions on the practice of PHCW about COVID–19. A correct answer was assigned 1 point while an incorrect/ I don't know the answer was assigned 0 points. A higher score denoted a good knowledge and lower score a poor knowledge of COVID–19, the same also applied to attitude and practice. Particularly, the scores above 60% were considered as good KAP.

Statistical analysis

Data entering and statistical analysis were done using the Statistical Package for Social Science (SPSS) version 25. Descriptive analysis of frequency and percentage were used to report categorical variables, while quantitative variables were reported using mean ± standard deviation. The association between the responses on KAP and demographic characteristics were tested using Chi-square test. Pearson correlation coefficient was used to evaluate the association that exists among KAP. Statistical significance was evaluated at $P<0.05$.

Results

A high response rate of 89.6% from 460 respondents was obtained. The majority of the respondents were married (74.0%), female (69.7%), and belonged to age group 30 to 39 (36.4%) and 40–49 (45.4%) as showed in Table 1. Community health workers and graduate constituted 40.8% and 56.1% of the respondents. The main sources of COVID–19 information reported by the respondents were radio (15%), television (TV) (14%) and NCDC (14%), as shown in Figure 1. Over 81% (26.0% + 31.7% + 23.3%) of the respondents attested that available information on COVID–19 were at least good, as shown in figure 2. Similarly, 72% (28% + 27% + 17%) of the respondents suggested that the measures adopted by the government, NCDC, and other health institutions in fighting COVID–19 were at least good as depicted in figure 3.

Table 2 reveals the overall knowledge, attitude, and COVID–19 related practices in mean ± standard deviation, percentages in two groups (poor and good), and correlation statistics. The proportions of primary health workers that have good scores in knowledge, attitude, and COVID–19 related practices are

86.4%, 85.0%, and 97.3% respectively. Also, the mean knowledge, attitude, and practices scores were 10.66±2.40, 8.28±1.94, and 8.34±1.39 in that order. The Pearson correlation test showed a significant positive association between knowledge and attitude ($r = 0.35$, $p<0.05$), and also between knowledge and practice ($r = 0.11$, $p<0.05$). But there was no significant association between attitude and practice.

The relationship between the demographic characteristics and mean KAP levels is expressed in Table 3. We found evidence that gender, occupation, and years of experience were associated with knowledge level ($p < 0.05$). Among these, only years of experience was significantly associated with attitude level ($p < 0.05$), whereas only marital status was significantly associated with practice level ($p < 0.05$).

Male respondents showed more knowledge compared to their female counterparts (11.28 vs 10.39). Physicians and nurses demonstrated more knowledge about COVID–19 (12.43 and 11.49) respectively than other categories of PHCW. We also found that experienced staff are more knowledgeable and have the right attitude compared with those who are new on the job. For instance, we found evidence of difference between those with >20 years and <5 years of experience on the job on knowledge (11.31 vs 9.75) and on attitude (9.08 vs 7.77). There was also a difference in COVID–19 related preventive practices between the single and married respondents (8.40 vs 8.32).

Table 1 Distribution of Primary Healthcare Workers According to their Demographic Characteristics

Characteristics	Number	Percentage
Gender		
Male	125	30.3
Female	287	69.7
Age as at last birthday		
<30	37	9.8
30-39	138	36.4
40-49	172	45.4
≥50	32	8.4
Mean ± SD	39.47±7.54	
Occupation		
Physician	30	7.7
Nurse	39	10.0
Medical Laboratory	47	12.1
Community health	159	40.8
Others	115	29.5
Educational level		
Diploma	181	43.9
Graduate	231	56.1
Senatorial district		
Rivers-east	143	34.7
Rivers-west	132	32.0
Rivers South-east	137	33.3
Marital status		
Single	107	26.0
Married	305	74.0
Years of experience		
<5	44	12.9
6-10	78	22.9

11-15	101	29.7
16-20	66	19.4
>20	51	15.0

Table 2 Number of questions, scores, and level of KAP regarding COVID-19

Levels	Range of scores	Total score (Mean ± SD)	Level (%)		Correlation		
			Poor	Good	Knowledge	Attitude	Practice
Knowledge	0-15	10.66±2.40	13.6	86.4	1	0.35*	0.11*
Attitude	0-11	8.28±1.94	15.0	85.0	0.35*	1	0.17
Practice	0-9	8.34±1.39	2.7	97.3	0.11*	0.17	1

*significant at P<0.05

Table 3 Mean score of Primary Healthcare Workers on the level of KAP

Characteristics	Mean ± Standard Deviation					
	Knowledge	P-value	Attitude	P-value	Practice	P-value
Gender		0.03		0.59		0.82
Male	11.28±2.19		8.41±1.90		8.43±1.10	
Female	10.39±2.45		8.22±1.96		8.31±1.50	
Age as at last birthday		0.87		0.56		0.52
<30	10.24±2.29		8.24±1.55		8.30±1.97	
30-39	10.97±2.31		8.28±1.94		8.41±1.11	
40-49	10.62±2.49		8.31±2.04		8.24±1.61	
≥50	10.47±1.93		8.35±1.93		8.63±0.66	
Occupation		0.03		0.77		0.08
Physician	12.43±1.45		8.43±1.48		8.50±0.90	
Nurse	11.49±2.04		8.64±1.33		8.36±1.55	
Medical Laboratory	10.11±2.78		8.06±2.19		7.85±2.22	
Community health	10.52±2.32		8.35±1.98		8.36±1.26	
Others	10.48±2.43		8.22±1.94		8.53±0.94	
Educational level		0.32		0.53		0.61
Diploma	10.51±2.48		8.38±2.00		8.35±1.44	
Graduate	10.77±2.33		8.21±1.90		8.34±1.36	
Senatorial district		0.29				
Rivers-east	10.62±1.10		8.41±1.60	0.16	8.48±0.82	0.28
Rivers-west	10.74±2.51		8.51±2.02		8.32±1.37	
Rivers South-east	10.63±2.67		7.94±2.14		8.23±1.82	
Marital status		0.07		0.06		0.05
Single	10.07±2.55		7.97±2.12		8.40±0.81	
Married	10.87±2.31		8.39±1.87		8.32±1.55	
Years of experience		0.00		0.03		0.49
<5	9.75±2.87		7.77±2.36		8.50±1.28	
6-10	11.35±1.84		8.09±1.89		8.23±1.56	

11-15	10.67±2.53	8.56±1.79	8.48±1.43
16-20	10.39±2.68	8.48±1.88	8.24±1.70
>20	11.31±1.65	9.08±1.34	8.51±0.78

Significant at P<0.05

Discussions

This study investigated the KAP of public primary healthcare workers towards COVID–19 in Rivers State, Nigeria. This was to ascertain the level of preparedness of primary healthcare workers to maintain services during the pandemic, as the primary level of healthcare is considered the “doorpost” of healthcare delivery. The study participants were predominantly of the female gender, married, and had post-secondary education. This is partly similar to other studies on KAP towards COVID–19 [11–13]. The major sources of information about the virus were radio, TV, and NCDC. This result is comparably the same with studies that showed the main source of information about similar viruses in the Netherlands [14] and Saudi Arabia [15], but contradicted another study in Nigeria that identified work colleagues as the major source of information [11]. This study also suggested that PHCWs are provided with good and adequate information regarding COVID–19 and that adequate measures are in place to combat the pandemic.

The findings on the knowledge scores demonstrated that most of the respondents had sufficient knowledge about COVID–19. This is comparable to earlier studies on KAP towards COVID–19 and similar viruses which revealed a knowledge level of at least 80% [12, 13, 15, 16]. The high knowledge demonstrated by the respondents might be attributed to the level of information available on the virus to the PHCWs, and the fact that most of the respondents were graduates as shown in this study. In addition, gender, occupation, and years of experience are identified as significant factors associated with knowledge level.

Male respondents showed higher knowledge scores than their female counterparts. This result was supported by a previous study on Middle East Respiratory Syndrome (MERS) in Saudi Arabia [15]. Similarly, physicians also showed higher knowledge scores than nurses and other paramedical professionals. This is in agreement with a study on KAP about COVID–19 among health care workers in China [12] and Pakistan [17]. The difference in knowledge scores between physicians and other health staff could be that the scope and quality of infection prevention control training for paramedical workers are low compared to that for physicians [18]. Regarding the association between experience in years and knowledge scores, an increase in years of experience was associated with an increase in mean knowledge scores. This is consistent with an earlier study [15].

The overall positive attitude score for COVID–19 was 85% under this study, which signified a high positive attitude among the HCWs towards COVID–19. This is supported by an earlier study in Pakistan that showed a high positive attitude among health care professionals towards COVID–19 [17]. This could

be explained partly by the good knowledge of COVID–19 among HCWs and positive linear correlation between knowledge and attitude scores demonstrated in the study. This is consistent with previous studies [17, 19]. The positive attitude towards the control and prevention of COVID–19 can also be explained by the actions and stringent control measures adopted by government and relevant agencies in fighting the disease, which include the closing of land and sea borders, airports, and all public spaces, such as open markets and schools [20].The only significant factor associated with attitude was years of experience. Year of experience was significantly related to both knowledge and attitude. This relationship had been reported by earlier studies [15, 21], but contradicted another study in Uganda [13]. Like on knowledge, an increased number of years expended on the job translated to an increase in mean attitude scores.

Furthermore, like knowledge and attitude, the results also revealed that the majority of PHCWs have good practices toward COVID–19 prevention, and this is similar to the findings of Khan et al and Saqlain et al on MERS and COVID–19 respectively [15, 17]. This result was expected because of the good knowledge, positive attitude of the respondents on COVID–19, and the positive linear correlation between knowledge and practice scores demonstrated in the study. This is partially in agreement with previous on KAP towards COVID–19 among Iranian residents [22]. Marital status was the only significant factor associated with COVID–19 related preventive practices, as the single respondents demonstrated better preventive practices than married participants. This was supported by previous studies on KAP towards COVID–19 in Iran [22] and Bangladeshi [23].

Conclusion

The very first step in public health interventions is awareness of the disease or problem. COVID–19 is considered a public health problem across the countries of the world and the number of cases is rapidly increasing in Nigeria. Therefore, the KAP as a measure of preparedness of the healthcare workers at the primary health facilities is of paramount importance. The results of this study demonstrated that the health workers at the primary level of care have sufficient knowledge, a positive attitude, and good preventive practices towards COVID–19, suggesting high level of preparedness to fight COVID–19 in Rivers State. We found evidence of a number of factors that are associated with knowledge level, attitude, and practice. There were associations between the knowledge levels of the PHCWs and their attitude and preventive practice. Based on these findings, we suggest that public health education programs should be sustained. Furthermore, training should be tailored to meet the peculiarities of the different categories of primary healthcare workers and years of practice.

Declarations

Acknowledgments

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State for their contribution towards the survey.

Ethical Issues

The study was approved by the Rivers State Health Research Ethics Committee (RSHMB/RSHREC/11.20/VOL.8/063). The questionnaire was administered with strict adherence to the standard instructions by the NCDC and the Ministry of Health, such as physical distancing, wearing of face masks and hand gloves. The written consent of each respondent was obtained before their participation.

Competing Interests

There were no competing interests to be declared

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Figures

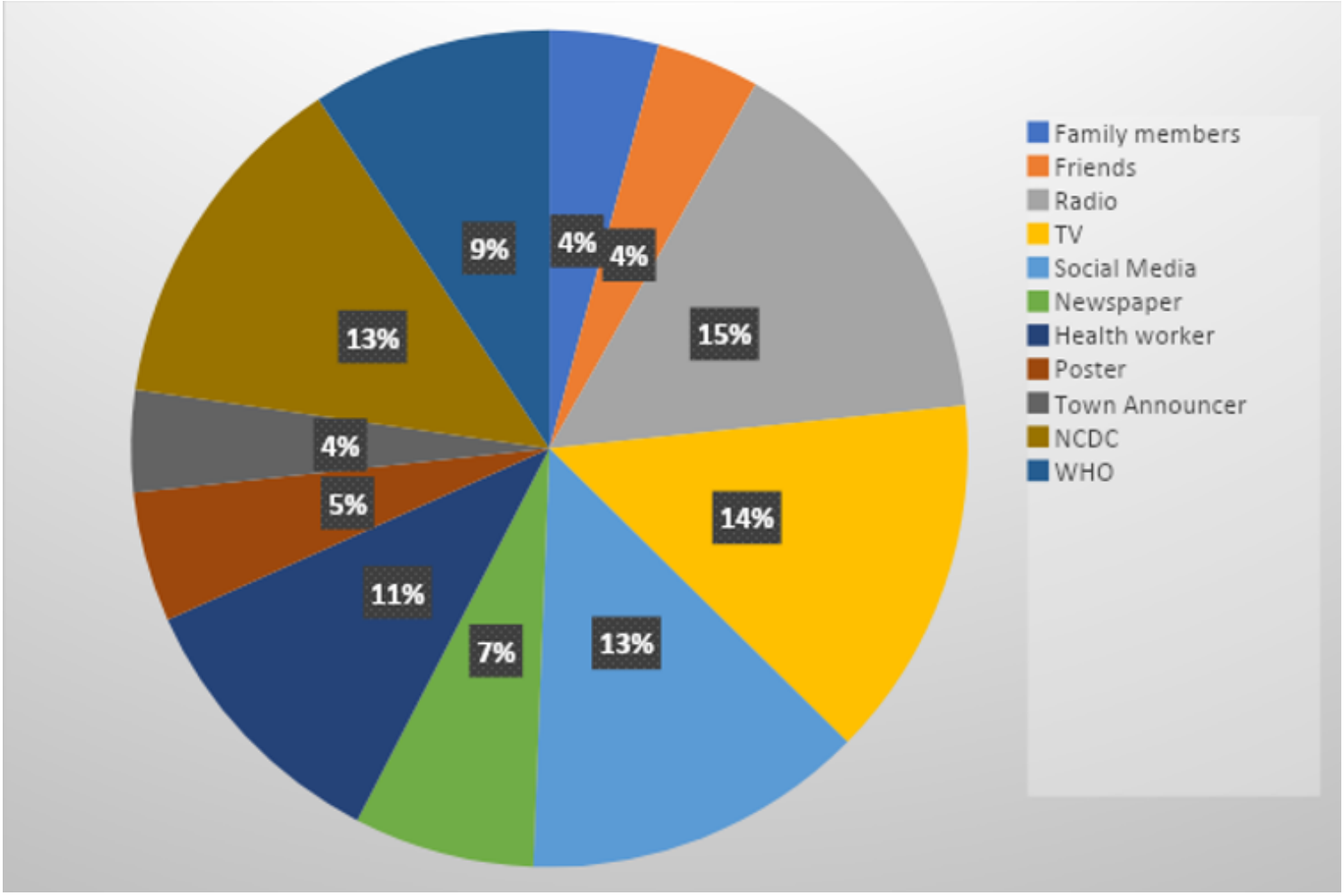

Figure 1

Source of information for COVID-19 by PHCW

Figure 2

Information available on COVID-19 by PHCW

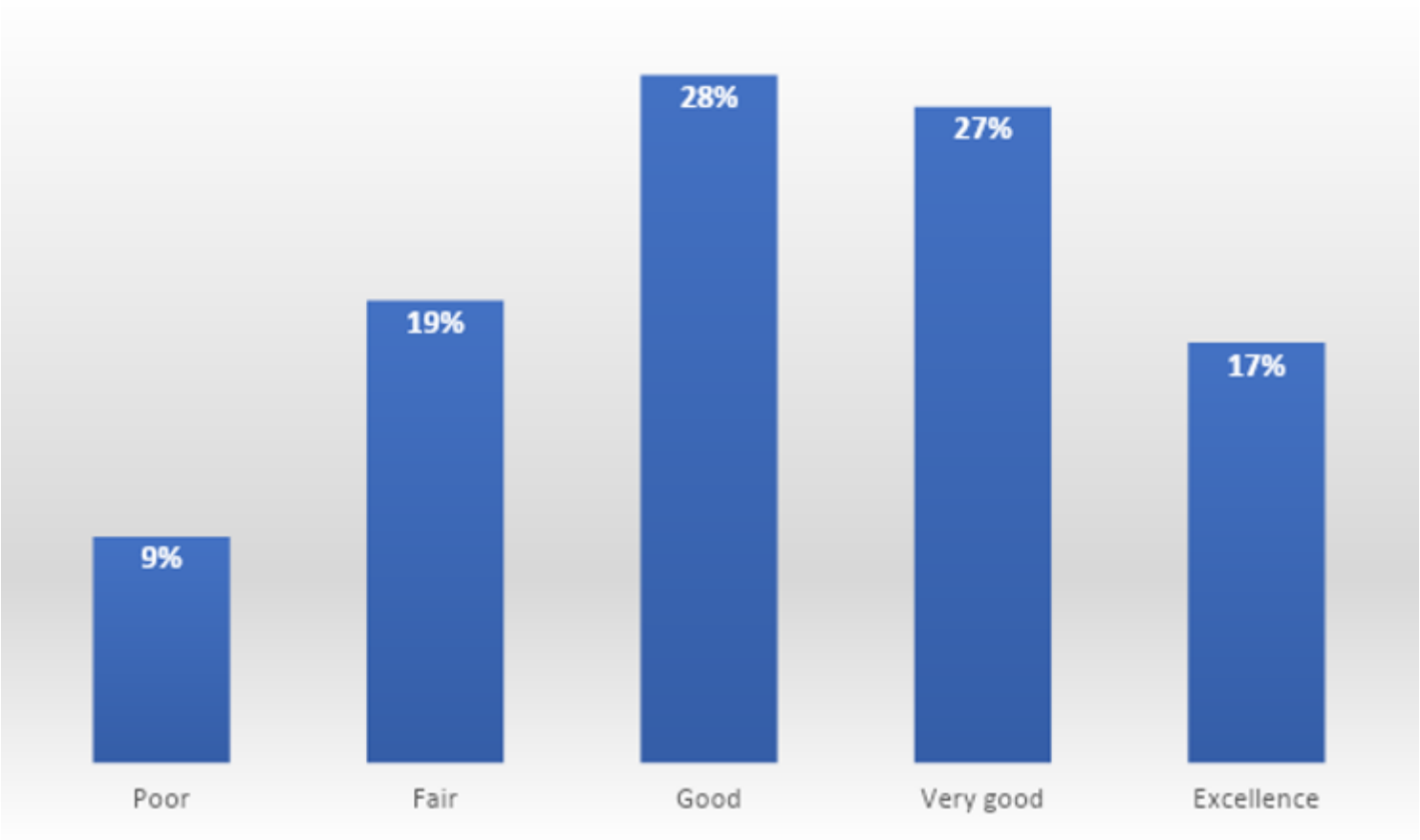

Figure 3

Measures adopted by the government, NCDC, and other health institutions in fighting COVID-19