Knowledge, Attitudes, and Practices of the General Population and People with Comorbidities Regarding COVID-19 in South Kivu, DR Congo.

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ABSTRACT

Background: In response to the COVID-19 pandemic, the WHO has advocated for focusing interventions on priority groups. This study aimed to determine the level of knowledge, attitudes, and practices of the general population and to compare them with those of individuals with comorbidities.

Methodes: This was a descriptive, cross-sectional study conducted in South Kivu from March 1st to April 30th, 2021.

Results: A total of 2011 subjects participated in the study, of which 1522 (75.69%) had no comorbidities and 489 (24.31%) had comorbidities. Among them, 817 (40.63%) resided in urban areas, while 1194 (59.37%) resided in rural areas. Men accounted for 1219 (60.62%) of the participants, while women accounted for 792 (39.38%). The mean age was 30.7 years, ranging from 18 to 96 years.

The overall score for knowledge, attitudes, and practices was 8.09 ± 3.66. It was 9.18 ± 3.89 among individuals with comorbidities and 7.00 ± 3.62 among those without comorbidities ($p < 0.05$).

There was a positive correlation between knowledge and attitude scores ($r=0.38$, $p < 0.05$), a negative correlation between knowledge and practice scores ($r=-.035$, $p > 0.05$), and a positive correlation between attitude and practice scores ($r= 0.44$, $p < 0.05$). Sociodemographic characteristics had minimal influence on the results.

Conclusion

The level of knowledge is satisfactory, but attitudes and practices remain unfavorable for the prevention of

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COVID-19. Individuals with comorbidities had more knowledge about the disease than the rest of the population. Implementing integrated and participatory strategies that bridge the gap between knowledge and behavior is essential to translate awareness into positive attitudes and effective practices across all population groups.

Keywords: Covid-19, Knowledge, attitudes and practices, Comorbidities, South-Kivu, DR. Congo

INTRODUCTION

As the world continues to grapple with the COVID-19 pandemic, scientists have consistently advocated for public health measures to control it: physical distancing, hand washing or sanitizing, coughing into elbows, mandatory mask-wearing, lockdowns, and more recently, vaccination [1, 2]. However, in response to these measures, populations have reacted differently, ranging from adherence to outright rejection [3, 4].

Several factors determine whether populations adhere to or reject these measures: the level of knowledge about the disease, the population's health literacy level, socio-economic status, the attitude of health and political authorities, customs and traditions, religion, risk perception, infodemics, and many others [4, 5, 6]. While public health interventions to address COVID-19 initially targeted the entire population, recent studies have shown the need to focus prevention interventions on priority targets or populations vulnerable to COVID-19 (those with comorbidities, immunocompromised individuals, people aged 55 and older, and healthcare professionals) to flatten the curve of hospital admissions and reduce mortality [7].

To date, most of these interventions focus on these target groups, thus indicating the need to focus on them to guide future actions.

METHODOLOGY

Study Framework:

The study was conducted in the city of Bukavu, located in the eastern part of the Democratic Republic of Congo, as well as its immediate surroundings within a radius of 50 kilometers. The study primarily focused on the health zones of Ibanda, Kadutu, and Bagira in the urban part of Bukavu, and those of Nyangezi and Walungu in the rural part.

Study Type:

This study was descriptive, cross-sectional, and quantitative, addressing the knowledge, attitudes, and practices of the population regarding COVID-19 during a wave of the pandemic. It was carried out from March 1st to April 30th, 2021, one year after the announcement of the first case of COVID-19 in the DRC. It is worth noting that the city of Bukavu was subjected to a three-day lockdown during the first wave of the pandemic.

Study Population and Inclusion Criteria:

The study population included all residents of Bukavu or the health zones of Walungu and Nyangezi, aged at least 18 years and present in the area during the study period, who provided consent after explanation. Excluded from the study were individuals under 18 years of age, those aged 18 and over but unable to consent due to a disability, non-residents of the targeted areas, and those who refused to participate in the study. The presence of comorbidities (diabetes, hypertension, cancer, HIV, asthma, hepatitis, etc.) was determined by the simple declaration of the respondent.

Sampling:

A non-random stratified sample by place of residence was selected, comprising an urban stratum consisting of the city of Bukavu and a rural stratum representing the outskirts of Bukavu. A sample of 2011 units was selected, and the teams worked until it was reached.

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Data Collection:

A team of investigators and supervisors was set up, including four supervisors, all university assistants, and twenty investigators, students in public health or medicine. The entire team was trained by the principal investigator in data collection. Data were collected using a pre-tested questionnaire, which was adapted based on field feedback. Urban investigators used Google Sheets, while those in rural health zones used paper forms, and the data were then entered into an Excel database.

Data Collection Tool, Score Determination, and Data Analysis

The survey questionnaire consisted of four parts: sociodemographic characteristics, knowledge, attitudes, and practices. For knowledge, attitudes, and practices, a similar method was used to determine scores: each correct answer scored one point, while each incorrect answer scored zero. Knowledge and practice scores were each rated on a scale of 5 points, while the attitude score was rated on a scale of 9 points. For analysis, Stata version 15.0 software was used, with Pearson's Chi-square test for comparing variables, Fisher's test for frequencies less than 5, and Student's T-test to compare the means of knowledge, attitudes, and practices variables between the two groups (with and without comorbidities), all calculations being based on a 95% confidence interval.

RESULTS

Sociodemographic Characteristics of Subjects:

Table 1 shows that a total of 2011 subjects participated in the study, including 1522 (75.69%) without comorbidities and 489 (24.3%) with comorbidities. Among them, 817 (40.63%) resided in urban areas while 1194 (59.37%) lived in rural areas. Additionally, there were 1219 (60.62%) male participants and 792 (39.38%) female participants. Furthermore, 1061 (52.76%) were unemployed, and over 80% identified as Catholic or Protestant followers. Half of the participants were single. The average age of the participants was 30.7 years, ranging from 18 to 96 years. Those with secondary education (40.63%) or higher education (47.40%) accounted for over 85% of the participants. Audio-visual media remained the primary source of information (49.73%), followed by the internet (42.07%), and healthcare professionals ranked third (36.10%).

Knowledge:

Knowledge about COVID-19 was assessed using the scores provided in Table 2. Overall, out of 10055 collected responses, 6862 (68.24%) were correct. Regarding knowledge based on sociodemographic characteristics, there was no statistically significant difference for all 5 questions (K1, K2, K3, K4, K5), except for K4 where gender showed a statistically significant difference: 542 (44.46%) correct responses for males vs. 315 (39.77%) for females, with $p<0.05$ (Table 3A and 3B). Moreover, for all 5 knowledge questions, individuals with comorbidities had a higher score (3.87±1.56) than the general population (2.16±1.47) with statistically significant differences ($p<0.05$), with knowledge scores ranging from 0 to 5 (Table 8).

Attitudes:

Out of 17884 recorded responses for attitudes, 5619 (31.40%) reflected positive attitudes towards COVID-19 preventive measures. Attitude scores were evaluated on a scale of 0 to 9, as shown in Table 4. Regarding attitudes based on sociodemographic characteristics, only question A9 showed statistically significant differences for age, profession, religion, and marital status, with $p<0.05$ (Tables 4A and 4B). Furthermore, for all 9 questions, individuals with comorbidities had a higher score of positive attitudes (3.14±1.60) compared to those without comorbidities (2.80±1.41), with statistically significant differences ($p<0.05$), with attitude scores ranging from 0 to 9 (Table 8).

Practices:

Regarding practices, a total of 10054 responses were collected, of which 3351 (33.33%) demonstrated individual and collective practices favorable to COVID-19 prevention. Practice scores were evaluated on a scale of 0 to 9, as indicated in Table 6. No sociodemographic variable showed statistically significant differences with the 5 questions used to measure practices (Tables 7A and 7B). Furthermore, for all 5 questions related to practices,

individuals without comorbidities had a higher score (2.17±0.73) than those with comorbidities (2.04±0.74), with statistically significant differences ($p<0.05$), with practice scores ranging from 0 to 5 (Table 8).

Comparison of Knowledge, Attitudes, and Practices Among Different Groups:

The overall score for knowledge, attitudes, and practices was 8.09 ± 3.66, 9.18 ± 3.89 among individuals with comorbidities, and 7.00 ± 3.62 among those without comorbidities, with a statistically significant difference ($p <0.05$), as shown in Table 8. There was a positive correlation between knowledge score and attitude score ($r=0.38$, $p <0.05$), a negative correlation between knowledge score and practice score ($r=-.035$, $p > 0.05$), and a positive correlation between attitude score and practice score ($r= 0.44$, $p <0.05$).

DISCUSSION

The COVID-19 pandemic has tested the world in various aspects, with the rapid acquisition of knowledge by scientists and its transmission to populations for prevention being a major challenge. The knowledge of populations influences whether preventive measures are adhered to or not.

This CAP study conducted in South Kivu among 2011 subjects revealed that the overall score of knowledge, attitudes, and practices was 8.09 ± 3.66, 9.18 ± 3.89 among individuals with comorbidities, and 7.00 ± 3.62 among those without comorbidities with a statistically significant difference ($p <0.05$), as shown in Table 8. There was a positive correlation between knowledge score and attitude score ($r=0.38$, $p <0.05$), between attitude score and practice score ($r= 0.44$, $p <0.05$), but a negative correlation between knowledge score and practice score ($r=-.035$, $p > 0.05$) [8,9,10].

This level of knowledge was higher among individuals with comorbidities than those without comorbidities. The COVID-19 pandemic is the first in the digital age, bringing with it an abundance of true and false information, an infodemic. During this wave, populations were able to obtain information from various sources [11].

The high level of knowledge among individuals with comorbidities is likely due to the focus of interventions on this group by all stakeholders on the recommendation of the WHO due to the high mortality among this group, as well as the constant concern of individuals with comorbidities to seek information about the risks involved. A study conducted in Haiti showed similar results for priority groups (elderly individuals (67%)/individuals with chronic diseases (57%) [13, 12].

CONCLUSION

This study highlights significant disparities in knowledge, attitudes and practices regarding COVID-19 between individuals with and without comorbidities in South Kivu. The findings emphasize the need for target, inclusive health education, particularly in rural areas, and call for sustained efforts to reduce health inequities and improve preparedness for future pandemics.

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Institutional Review Board Statement: This study was conducted in accordance with the Helsinki Declaration II. Authorization was also provided by health and politico-administrative authorities.

Informed Consent Statement: All participants provided verbal informed consent before taking part in the study.

They were fully informed by the research team on the study's purpose, objectives, potential risks and benefits, and were assured of their right to participate voluntarily or withdraw at any time without repercussions.

Data Availability Statement: The data presented in this study are available on request.

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Conflicts of Interest: The authors declare no conflict of interest.

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Table 1 : Socio-demographic characteristics by population

Variables	Terms and Conditions	Comorbidities (n=489, 24.3%)	Without Comorbidities (n=1522, 75.69%)	Package (N=2011, 100%)	χ^2 (df), p
Age	Minimum: 18, Max: 96, Avg: 30.7				

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Under 55		469 (24.59%)	1438 (75.41%)	1907 (94.82%)	1.5412 (1), p = 0.214
Over 55		20 (19.23%)	84 (80.77%)	104 (5.18%)	
Type					
Male		305 (25.02%)	914 (74.98%)	1219 (60.62%)	0.8341 (1), p = 0.361
Female		184 (23.23%)	608 (76.77%)	792 (39.38%)	
Profession					2.0728 (2), p = 0.355
Unemployed		265 (24.98%)	796 (75.02%)	1061 (52.76%)	
With paid employment		135 (22.28%)	471 (77.72%)	606 (30.13%)	
Self-employed		89 (25.87%)	255 (74.13%)	344 (17.11%)	
Education					3.2487 (3), p = 0.355
Did not study		24 (20.51%)	93 (79.49%)	117 (5.82%)	
Primary		37 (29.84%)	87 (70.16%)	124 (6.17%)	
Secondary		193 (23.62%)	624 (76.38%)	817 (40.63%)	
University		235 (24.66%)	718 (75.34%)	953 (47.40%)	
Residence					0.0611 (1), p = 0.805
Urban		201 (24.60%)	616 (75.40%)	817 (59.37%)	
Rural		288 (24.12%)	906 (75.88%)	1194 (40.63%)	
Marital Status					3.4999 (3), p = 0.321
Single		260 (25.00%)	780 (75.00%)	1040 (51.72%)	
Married/ Common-law		214 (24.26%)	668 (75.74%)	882 (43.86%)	
Divorced		7 (21.21%)	26 (78.79%)	33 (1.64%)	
Widows		8 (14.29%)	48 (85.71%)	56 (2.78%)	
Religion					1.7793 (3), p = 0.619
Catholic		211 (25.24%)	625 (74.76%)	836 (41.57%)	
Protestant		200 (24.18%)	627 (75.82%)	827 (41.12%)	
No religion		28 (25.23%)	83 (74.77%)	111 (5.52%)	
Other		50 (21.10%)	187 (78.90%)	237 (11.78%)	

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Sources of Information	Comorbidities (n=489, 24.3%)	Without Comorbidities (n=1522, 75.69%)	Total (N=2011, 100%)	χ^2 (df), p
Radio/TV	279 (57.06%)	721 (47.37%)	1000 (49.73%)	(1), p = 0.000
Internet	246 (50.31%)	600 (39.42%)	846 (42.07%)	17.9925 (1), p = 0.000
Healthcare professionals	312 (63.80%)	414 (27.20%)	726 (36.10%)	214.9416 (1), p = 0.000
Word of mouth	169 (34.56%)	298 (19.58%)	467 (23.22%)	46.5847 (1), p = 0.000
Cults	98 (20.04%)	383 (25.16%)	481 (23.92%)	5.3384 (1), p = 0.021
School/University	106 (21.68%)	204 (13.40%)	310 (15.41%)	19.4288 (1), p = 0.000

Table 2: Knowledge of COVID-19 by group

	Without Comorbidities	With Comorbidities	Total
Total Incorrect Answers	2471 (33.08%)	722 (27.92%)	3193 (31.76%)
Total Correct Answers	4998 (66.92%)	1864 (72.08%)	6862 (68.24%)
Total Responses	**7469**	**2586**	**10055**

Table 3A: Comparison of awareness of COVID-19 according to socio-demographic characteristics

Variable	Age	χ^2 (df), p	Gender	χ^2 (df), p	Occupation	χ^2 (df), p
	Under 55	Over 55s	Male	Female	Paid Emp.	Indep.
K1: Cause of COVID-19 (Correct)	605 (31.73%)	27 (25.96%)	1.5203 (1), p = 0.218	399 (32.73%)	233 (29.42%)	2.4445 (1), p = 0.118
K2: Transmission Route (Correct)	806 (42.27%)	40 (38.46%)	0.5855 (1), p = 0.444	533 (43.72%)	313 (32.52%)	3.4818 (1), p = 0.062
K3: Signs & Symptoms (Correct)	1,255 (65.81%)	72 (62.23%)	0.5141 (1), p = 0.473	803 (65.87%)	524 (66.16%)	0.0177 (1), p = 0.894
K4: Asymptomatic Transmission (Correct)	816 (42.79%)	41 (39.42%)	0.4571 (1), p = 0.499	542 (44.46%)	315 (39.77%)	**4.3181 (1), p = 0.038**
K5: Prevention Methods (Correct)	1,445 (75.77%)	77 (74.04%)	0.1613 (1), p = 0.688	939 (77.03%)	583 (73.61%)	3.0498 (1), p = 0.081

Table 3B: Comparison of awareness of COVID-19 according to socio-demographic characteristics (Continued)

Variable	Religion (n, %)	χ^2 (df), p	Residence (n, %)	χ^2 (df), p	Education (n, %)	χ^2 (df), p	Marital Status (n, %)	χ^2 (df), p
	Catholic	Protestant	Other	No Religion		Urban	Rural	

K1: Cause (Correct)	211 (25.24)	200 (24.18)	50 (21.10)	28 (25.23)	1.7793 (3), p = 0.619	201 (24.60)	288 (24.12)	0.0611 (1), p = 0.805
K2: Transmission (Correct)	356 (42.08)	342 (40.43)	97 (11.47)	51 (6.03)	1.0754 (3), p = 0.783	344 (40.66)	502 (59.34)	0.0008 (1), p = 0.978
K3: Symptoms (Correct)	561 (42.28)	536 (40.39)	161 (12.13)	69 (5.20)	2.0972 (3), p = 0.552	538 (40.54)	789 (59.46)	0.0114 (1), p = 0.915
K4: Asymptomatic Transmission (Correct)	361 (43.18)	345 (41.72)	98 (41.35)	53 (47.75)	1.7333 (3), p = 0.630	348 (42.59)	509 (42.63)	0.0002 (1), p = 0.988
K5: Prevention (Correct)	625 (74.76)	631 (76.30)	178 (75.11)	88 (79.28)	1.3804 (3), p = 0.710	620 (75.89)	902 (75.54)	0.0310 (1), p = 0.860

Table 4: Attitudes towards COVID-19 according to group

Variable	Options	Without Comorbidities n (%)	With Comorbidities n (%)	χ^2 (df)	P-value
A1: Ready to be vaccinated?	Yes (Positive)	248 (39.18%)	385 (60.82%)	668.9247 (1)	0
	No (Negative)	1,274 (92.45%)	104 (7.55%)		
A2: Agree with compulsory mask use?	Yes (Positive)	1,205 (79.70%)	307 (20.30%)	53.2957 (1)	0
	No (Negative)	317 (63.53%)	182 (36.47%)		
A3: Agree with closure of places of worship/education?	Yes (Positive)	244 (72.62%)	92 (27.38%)	2.0588 (1)	0.151
	No (Negative)	1,278 (76.30%)	182 (36.47%)		
A4: Agree with limiting passengers on public transport?	Yes (Positive)	608 (75.43%)	198 (24.57%)	0.0455 (1)	0.831
	No (Negative)	914 (75.85%)	291 (24.15%)		
A5: Agree with banning large public gatherings?	Yes (Positive)	403 (74.49%)	138 (25.51%)	0.5715 (1)	0.45
	No (Negative)	1,119 (76.12%)	351 (23.88%)		
A6: Agree with closing borders?	Yes (Positive)	27 (77.14%)	8 (22.86%)	0.0412 (1)	0.839
	No (Negative)	1,495 (75.66%)	481 (24.34%)		
A7: Agree with isolating patients?	Yes (Positive)	299 (22.35%)	190 (28.23%)	8.4266 (1)	0.004
	No (Negative)	1,039 (77.65%)	483 (71.77%)		

A8: Agree with compulsory handwashing/disinfection in public places?	Yes (Positive)	81 (5.32%)	33 (6.75%)	1.4084 (1)	0.235
	No (Negative)	1,441 (94.68%)	456 (93.25%)		
A9: Response to signs of COVID-19?	Go to CS / Call hotline (Positive)	793 (52.10%)	357 (73.01%)	66.0508 (1)	0
	Other (Negative)	729 (47.90%)	132 (26.99%)		

Table 5 A: Comparison of respondents' attitudes to COVID-19 according to socio-demographic characteristics.

Variable	Answer	Under 55 n(%)	Over 55s n(%)	χ^2 (df)	P	Male n(%)	Female n(%)	χ^2 (df)	P	With Paid Employment n(%)	Independent n(%)	Unemployed n(%)	χ^2 (df)	P
A1 Ready to vaccinate	Positive	606 (95.73)	27 (4.27)	1.5467 (1)	0.214	399 (63.03)	234 (36.97)	2.2597 (1)	0.133	177 (27.96)	123 (19.43)	333 (52.61)	4.3707 (2)	0.112
A2 Agree with mask use	Positive	1429 (95.79)	83 (5.49)	1.2554 (1)	0.263	296 (59.32)	203 (40.68)	0.4684 (1)	0.494	150 (30.06)	82 (16.43)	267 (53.51)	0.2472 (2)	0.884
A3 Agree with closures	Positive	317 (94.35)	19 (5.65)	0.1921 (1)	0.661	219 (65.18)	117 (34.82)	3.5167 (1)	0.061	100 (29.76)	76 (19.05)	172 (51.19)	1.0960 (2)	0.578
A4 Limit public transport	Positive	760 (39.85)	45 (44.23)	0.7869 (1)	0.375	886 (39.87)	320 (40.40)	0.0573 (1)	0.811	237 (39.11)	135 (39.24)	434 (40.90)	0.6386 (2)	0.727
A5 Ban large gatherings	Positive	514 (26.95)	27 (25.96)	0.0493 (1)	0.824	322 (26.42)	219 (27.65)	0.3732 (1)	0.541	159 (26.24)	92 (26.74)	290 (27.33)	0.2405 (2)	0.887
A6 Close borders	Positive	33 (1.73)	2 (1.92)	0.0214 (1)	0.702	22 (1.80)	13 (1.64)	0.0749 (1)	0.784	9 (1.49)	4 (1.16)	22 (2.07)	1.5904 (2)	0.511
A7 Isolate patients	Positive	629 (32.98)	44 (42.31)	3.8506 (1)	0.05	420 (34.45)	253 (31.94)	1.3584 (1)	0.244	199 (32.84)	124 (36.05)	350 (32.99)	1.2450 (2)	0.537
A8 Compulsory handwashing	Positive	111 (5.82)	3 (2.88)	1.5898 (1)	0.276	65 (5.33)	49 (6.19)	0.6557 (1)	0.418	56 (5.28)	38 (6.27)	20 (5.81)	0.7270 (2)	0.695
A9 Action if symptoms appear	Positive	1,150 (100.00)	0 (0.00)	146.4837 (1)	0	964 (60.35)	456 (39.65)	0.0813 (1)	0.776	689 (59.91)	289 (25.13)	172 (14.96)	55.6220 (2)	0

Table 6: COVID-19 practices by group

Variables	Options	Without Comorbidities n (%)	With Comorbidities n (%)	χ^2 (df)	P-value
P1: Masks must be worn	Good (Correct/1)	1073 (70.50)	323 (66.05)	3.4463 (1)	0.063

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	Wrong (Incorrect/0)	449 (29.50)	166 (33.95)		
P2: Regular hand washing with soap/use of hydrogel	Good (Correct/1)	137 (28.02)	352 (71.98)	2.8294 (1)	0.093
	Wrong (Incorrect/0)	488 (32.06)	1034 (67.94)		
P3: Physical distance	Good (Correct/1)	355 (72.60)	134 (27.40)	7.3358 (1)	0.007
	Wrong (Incorrect/0)	1195 (78.52)	327 (21.48)		
P4: Regular cleaning of frequently touched areas	Good (Correct/1)	244 (49.90)	245 (50.10)	10.5624 (1)	0.001
	Wrong (Incorrect/0)	887 (58.28)	635 (41.72)		
P5: Coughing/sneezing below the elbow	Good (Correct/1)	478 (97.96)	10 (2.04)	1.0135 (1)	0.314
	Wrong (Incorrect/0)	1478 (97.11)	44 (2.89)		

Table 7A: Comparison of respondents' practices on COVID-19 according to socio-demographic characteristics.

Variables	Options	Under 55 n(%)	Over 55s n(%)	χ^2 (df)	P-value	Male n(%)	Female n(%)	χ^2 (df)	P-value	Unemployed n(%)	With Paid Employment n(%)	Independent n(%)	χ^2 (df)	P-value
P1 - Good	Correct (1)	1,331 (69.80)	65 (62.50)	2.4725 (1)	0.116	849 (69.65)	547 (69.07)	0.0765 (1)	0.782	737 (69.46)	428 (70.63)	231 (67.15)	1.2509 (2)	0.535
	Incorrect (0)													
P2 - Good	Correct (1)	1,311 (68.75)	75 (72.12)	0.5225 (1)	0.47	836 (68.58)	550 (69.44)	0.1672 (1)	0.683	747 (70.41)	396 (65.35)	243 (70.64)	5.1803 (2)	0.075
	Incorrect (0)													
P3 - Good	Correct (1)	434 (22.76)	27 (25.96)	0.5727 (1)	0.449	281 (23.05)	180 (22.73)	0.0286 (1)	0.866	257 (24.22)	121 (19.97)	83 (24.13)	4.2935 (2)	0.117
	Incorrect (0)													
P4 - Good	Correct (1)	827 (43.37)	53 (50.96)	2.3116 (1)	0.128	534 (43.81)	346 (43.69)	0.0028 (1)	0.958	451 (43.45)	259 (42.74)	160 (46.51)	1.3564 (2)	0.508
	Incorrect (0)													

P5 - Good	Correct (1)	52 (2.73)	2 (1.92)	0.2438 (1)	1	27 (2.21)	27 (3.41)	2.6199 (1)	0.106	30 (2.83)	11 (1.82)	13 (3.78)	3.4128 (2)	0.182
	Incorrect (0)													

Table 7B: Comparison of respondents' practices on COVID-19 according to socio-demographic characteristics (continued)

Variables	**Options**	**Catholic n(%)**	**Protestant n(%)**	**Other n(%)**	**Without n(%)**	**χ^2 (df)**	**P-value**	**Urban n(%)**	**Rural n(%)**	**χ^2 (df)**	**P-value**	**Did not Study n(%)**	**Primary n(%)**	**Secondary n(%)**	**Superior n(%)**	**χ^2 (df)**	**P-value**	**Single n(%)**	**Married n(%)**	**Divorced n(%)**	**Widower n(%)**	**χ^2 (df)**	**P-value**
P1 - Good	Correct (1)	588 (70.33)	568 (68.68)	78 (70.27)	162 (68.35)	0.7064 (3)	0.872	580 (70.99)	816 (68.34)	1.6043 (1)	0.205	74 (63.25)	79 (63.71)	584 (71.48)	659 (69.15)	5.6716 (3)	0.129	723 (69.52)	614 (69.61)	20 (60.61)	39 (69.64)	1.22945 (3)	0.746
	Incorrect (0)																						
P2 - Good	Correct (1)	561 (67.11)	580 (70.13)	79 (71.17)	166 (70.04)	2.2554 (3)	0.521	557 (68.18)	829 (69.43)	0.3562 (1)	0.551	82 (70.09)	89 (71.77)	546 (66.83)	669 (70.20)	2.9403 (3)	0.401	732 (70.38)	587 (66.55)	25 (75.76)	42 (75.00)	5.0347 (3)	0.169
	Incorrect (0)																						
P3 - Good	Correct (1)	179 (21.41)	209 (25.27)	21 (18.92)	52 (21.94)	4.8004 (3)	0.187	185 (22.64)	276 (23.12)	0.0611 (1)	0.805	18 (15.38)	27 (21.77)	197 (24.11)	219 (22.98)	4.5117 (3)	0.211	253 (24.33)	185 (20.98)	9 (27.27)	14 (25.00)	3.5444 (3)	0.315
	Incorrect (0)																						
P4 - Good	Correct (1)	355 (42.46)	371 (44.86)	45 (40.54)	109 (45.99)	1.9248 (3)	0.588	349 (42.72)	531 (44.47)	0.6072 (1)	0.436	53 (45.30)	59 (47.58)	350 (42.84)	418 (43.86)	1.1333 (3)	0.769	452 (43.46)	389 (44.10)	19 (57.58)	20 (35.71)	4.1125 (3)	0.25
	Incorrect (0)																						
P5 - Good	Correct (1)	27 (3.23)	20 (2.42)	3 (2.70)	4 (1.69)	2.0761 (3)	0.588	20 (2.45)	34 (2.85)	0.2964 (1)	0.674	7 (5.98)	3 (2.42)	22 (2.69)	22 (2.31)	5.4203 (3)	0.172	30 (2.88)	20 (2.27)	2 (6.06)	2 (3.57)	2.3541 (3)	0.297

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Table 8: Comparison of the knowledge, attitudes and practices of respondents with and without comorbidity regarding COVID-.

Variables	(n)	Knowledge	Attitudes	Practices	Total KAP
		X ± S	t	p	X ± S
With comorbidities	489	3.87 ± 1.56	21.98	0	3.14 ± 1.60
Without comorbidities	1522	2.16 ± 1.47			2.80 ± 1.41

The T-sudent test for independent samples was used to compare the KAP scores between the two population groups.