KNOWLEDGE ATTITUDE AND PRACTICE OF STUDENTS OF THE SUPERIOR HEALTH SCHOOLS OF THE MOZAMBICAN UNIVERSITIES ABOUT COVID-19.

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ABSTRACT

Background: In China, a viral disease emerged which spread to the remainder of the world at an impressive speed, making it a pandemic that led a majority of countries in the world to declare a state of partial or total emergency with resulting repercussions. The aim of this study was to assess the level of knowledge, attitudes, and practices of COVID-19 among students of the health sciences fields in six higher education institutions in Mozambique. **Methods**: An online survey was created, similar to the one used in a study in China, Portugal, Mozambique and Brazil. This is an exploratory, descriptive study, using a quantitative. An online questionnaire with closed questions was used as a collection tool, with 35 related to knowledge and perception, 2 to attitude and 7 to practices. **Results**: A total of 786 students participated in the study, of which 67% were female. The average age of the students was 22.7 years.The average level of knowledge of the students surveyed in the 33 questions related to COVID-19 was 70.2%. **Conclusions**: The present study thus showed that the knowledge about COVID-19 in future Mozambican health professionals during the outbreak was satisfactory, attitudes have been very favorable, and practices are mostly suitable.

Keywords: COVID-19; Knowledge; Practices; Attitudes; Mozambique; Students; University.

CONHECIMENTOS, ATITUDES E PRÁTICAS DOS ESTUDANTES DAS ESCOLAS SUPERIORES DE SAÚDE DAS UNIVERSIDADES MOÇAMBICANAS SOBRE COVID-19

Resumo

Introdução: Na China surgiu uma doença viral que foi se alastrando para o resto do mundo com uma velocidade impressionante, tornando numa pandemia que levou a maioria dos países do mundo a decretarem o estado de emergência parcial ou total com as repercussões daí resultantes. **O objectivo** deste estudo foi avaliar o grau de conhecimento, atitudes e práticas sobre o COVID-19 entre os estudantes da área de saúde em seis instituições de ensino superior de Moçambique. **Metodologia**: Para tal foi criado um inquérito online, semelhante ao usado num estudo na China Moçambique, Portugal e Brasil. Trata-se de um estudo exploratório, descritivo, usando abordagem quantitativa.Foi usado como instrumento de colheita um questionário online de perguntas fechadas, com 35 relacionadas com o conhecimento e percepção , 2 de atitude e 7 de práticas. **Resultados**: Participaram no estudo 786 estudantes, sendo 67% de sexo feminino. A idade média dos estudantes foi de 22.7 anos. O nível médio de conhecimento dos estudantes inqueridos foi de 23.17 sugerindo um total de 70.2 % de respostas correctas. **Conclusão**: O presente estudo mostrou que conhecimento sobre o COVID-19 nos futuros profissionais de saúde moçambicanos durante o surto foi satisfatório, com atitudes bastante favoráveis e práticas adequadas.

Palavras-Chaves: COVID-19, Conhecimento, Práticas, Atitudes, Moçambique, Estudantes, Universidade.

INTRODUCTION

The pandemic caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2) started in December 2019 in China. The first report was published on 30 December 2019 by ProMED-mail (Emerging Disease Monitoring Program) addressing the existence of a pneumonia outbreak of unknown etiology, possibly related to contact with a seafood market in Wuhan, in China(ProMEd, 2019).On December 31, 2019, the World Health Organization (WHO) office in China got a report on the presence of cases of pneumonia of unknown etiology recognized around Wuhan City, with a population of 19 million, which is the capital in the Hubei province, with a population of 58 million people(WHO, 2020b) .

The impact of Coronavirus Disease 2019 (COVID-19) worldwide is great and the Director-General of WHO declared on January 30, 2020, the disease due to a new coronavirus as an International Public Health Emergency (DGS, 2020).

Since the start of the pandemic, the Ministry of Health of Mozambique (MISAU) has carried out a major public health education campaign, disseminating information about COVID-19 through the radio, website, television, newspapers, posters, lectures and social networks, guiding populations to prevent the disease. The President of the Republic on March 20, 2020, addressed the nation and ordered the closure of all educational institutions from March 23, and decreed the State of Emergency, through Presidential Decree Nº. 11 / 2020 of March 30, to prevent the spread of the COVID-19 pandemic, safeguarding human life, public health and guaranteeing the functioning of services.

Despite the guidance of the President of the Republic, the measures have not been fully complied with by the general population, mainly with regard to the use of masks, restriction of population gatherings and compliance with social distance.

There was a concern to assess the level of knowledge, attitudes, and practices of students from health schools in Mozambican universities on the prevention of COVID-19, in the hope

that the resulting findings may serve as a means of intervention by part not only of the health authorities of Mozambique, but also of education for intervention in the field of behavioral changes and practices of future health professionals.

On March 22, 2020, Mozambique recorded the 1st case of a positive COVID-19 patient (MISAU, 2020a) On April 4, 2020, the first recovered case of COVID-19 was recorded (MISAU, 2020b), on May 25, 2020, the first death was registered by COVID-19 (MISAU, 2020c) and on March 8, 2021, started vaccination against COVID-19 in Mozambique (MISAU, 2021). Until 17th January 2022, Mozambique had 219.390 cumulative cases , 28.185 active cases, 2.132 deaths and 189.069 recovered (MISAU, 2022).

METHODS

Study design

This is a descriptive study, using a quantitative approach to assess the knowledge and attitudes of health students at higher health schools in Mozambican universities. The present study took place from April 15th to May 8th, 2020. It took place at Instituto Superior de Ciências e Tecnologia Alberto Chipande (ISCTAC), Instituto Superior de Ciências e Tecnologia de Moçambique (ISCTEM), Universidade Católica de Moçambique (UCM), Universidade Eduardo Mondlane (UEM), Universidade Lúrio (UniLúrio) and Universidade Zambeze (UniZambeze).

Study population

All students enrolled in undergraduate health courses at ISCTAC, ISCTEM, UCM, UEM, UniLúrio and UniZambeze in 2020, who agreed to participate and voluntarily completed the form (Table I).

Table I: Study population

COURSE	ISCTAC	ISCTEM	UCM	UEM	UniLúrio	UniZambeze
Health Administration and Management					X	
Hospital Administration and Management						X

Clinical and Laboratory Analysis			X			
Nursing			X			
Pharmaceutic	X	X	X		X	X
Physiotherapy	X					
Health and safety at work	X					
Medicine	X	X	X	X	X	X
Dentistry	X	X			X	X
Nutrition					X	X
Optometry					X	
Clinical Psychology					X	
Clinical Psychology and Social Assistance			X			
Public Health	X					

All undergraduate health students from the first to the last year were included in the study. They were excluded: Students who did not accept to participate, who did not agree to the consent form, and non-health courses.

Study instrument

A data collection form was developed by the researcher and tested for validity and reliability. For data collection an online survey was created on Google Forms, with closed questions similar to a study carried out in China (Zhong et al., 2020) Mozambique (OrMM, 2020), Portugal (ENSP-NOVA, 2020b) and Brazil (Candeiro et al., 2020) and among us, with discreet questions that do not tend to blame participants for any practice that is referred to. The students were informed of this survey by their respective class leaders, through various existing WhatsApp groups. The survey comprised of 51 questions: 7 of personal data, 35 of knowledge (K1-K35), including 2 questions of perception (K34-K35), 2 of attitude (A1-A2) on the control of COVID-19 and confidence in winning the pandemic and 7 practice (P1-P7). The knowledge section was divided into 5 parts: clinical condition (1-14) evolution and transmission (15-21) prevention (22-30) diagnosis (31-32) and epidemiology of COVID-19 (33).

These inquiry were answered on a true / false basis with an additional "I don't know" option and multiple choice. Each right answer was assigned 1 point and for incorrect / unknown answers 0 points. The total knowledge was scored from 0 to 33 (excluding the perception

questions), with a higher score denoting a better knowledge of COVID-19. A result of less than 11 was assessed as unsatisfactory knowledge, between 11 to 22 indicated moderate knowledge and greater than 22 indicated good knowledge.

Statistical analysis

All data was collected, according to the procedures presented at study protocol and after authorization from the Deans of all six health schools in Mozambican universities. Data analyses were conducted with SPSS-26.0 (Statistical Package for the Social Sciences).

The analysis focused on the calculation of measures of central tendency (frequency, average and median) and some crosses were presented. The data were presented in frequency tables and bar graphs. The Cronbach's alpha coefficient of the questionnaire was 0.63 in our sample, indicating satisfactory consistency (Taber, 2017).

Ethics approval and consent to participate

This study was approved by the Institutional Ethics Committee of Faculty of Medicine and Maputo Central Hospital (CIBS FM&HCM/025/2020) (Figure 1). Written consent was obtained from each eligible student participant when responded the online questionnaire.

A brief explanation was presented to the participants, explaining the objectives of the study, and informing about the guarantee of confidentiality of the information, that they would not be disclosed, and that the data would be under the protection of the principal investigator. After being analyzed, it was kept by the same, preserving the confidentiality and anonymity of each of the participants and, after a determined period of five years, the principal investigator would destroy them. The absence of a name made it impossible for the investigator to recognize the participant. No payment or subsidy was offered to participants. The study did not bring direct benefits to the participants, but the results will serve to identify the learning needs to design a training project for students on COVID-19. The present study did not bring any life risks to the participants or to the researcher. The only constraint was the expense of internet to answer

the survey.

The students had to address a yes-no question to affirm their willingness to participate voluntarily. After confirmation of the question, the student was guide to complete the survey.

Limitations

The way of gathering information was a study bias because we were not able to be sure whether it was the health student who completed the survey. The survey had no email or student name making the study completely anonymous. With that, it was not possible to control, if the same student filled out one or more times, despite having controlled this limitation (removing duplicate). The closure of schools across the country because of the state of emergency, made it difficult to locate some students, who were probably outside the large cities where universities are located. Not all students had cell phones or cell phones with internet access. The use of an online questionnaire as a research tool instead of a face-to-face interview can be a limitation to be considered. The participants could have given answers that were the most correct or desired to hear (response bias). During the data collection period, mobile internet operators presented a malfunction.

RESULTS

Demographic and academic characteristics of participants

During the study period, a total of 842 surveys were analyzed, 16 were excluded for not agreeing to sign the informed consent to participate in the study and 40 data duplication surveys were also excluded, leaving a final sample of 786 students.

Among this final sample, 67% (527/786) were women, the average age was 22.7 years (range: 16-50), 89.3% (702/786) were single 23.4% (184/786) were 1st year students. Most of the students surveyed (43.8%) were from ISCTEM. ISCTAC was the university with the lowest number of students who answered the survey with 6.6% (Table II).

Until 29 years of age, there was predominance of females and after the age of 30 there was a predominance of males (Figure 2).

Table II: Demographic and academic characteristics of participants (786)

| Characteristics		(n)	(%)
Gender	Female	527	67.0
	Male	259	33.0
Age-group (years)	≤19	201	25.6
	20-24	393	50.0
	25-29	116	14.8
	30-34	53	6.7
	≥ 35	23	2.9
Marital status	Single	702	89.3
	Non-marital partnership	42	5.3
	Married	37	4.7
	Divorced	4	0.5
	Widowed	1	0.1
University	ISCTAC	52	6.6
	ISCTEM	344	43.8
	UCM	102	13.0
	UEM	111	14.1
	UniLúrio	106	13.5
	UniZambeze	71	9.0
Year	1st	184	23.4
	2nd	179	22.8
	3rd	143	18.2
	4th	146	18.6
	5th	107	13.6
	6th	27	3.4
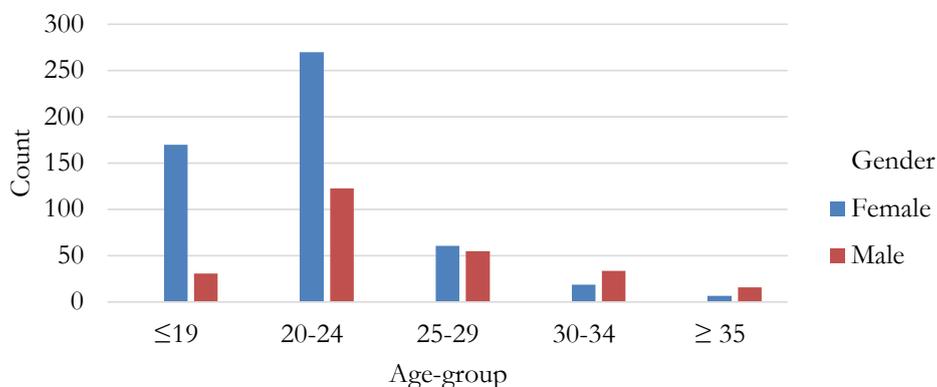
Figure 1: Distribution of students by age-group and gender.

KNOWLEDGE

The knowledge section was divided into 5 parts (Table III): clinical condition (1-14) evolution and transmission (15-21) prevention (22-30) diagnosis (31-32) and epidemiology of COVID-19 (33).The average level of knowledge of the students surveyed in the 33 questions of the knowledge questionnaire in relation to COVID-19 was 23.17 (standard deviation 2.89; interval 0-33; mode 23; maximum 31; minimum 12) suggesting a total of 70.2% (minimum 36.4%; maximum 93.9%) of correct answers. The male had better knowledge than the female. (Table IV).

The average knowledge of the respondents in the question related to the symptoms of COVID-19 was 5.70 (suggesting a total of 57%) variance of 2.04, minimum of 0/10 and maximum of 10/10. Most students (53.4%; 420/786) think that flu-like symptoms (nasal obstruction, rhinorrhea, and sneezing) are less frequent in patients infected with COVID-19.

Table III: Knowledge and perception of the students about COVID-19 (786)

Knowledge	Options	n	%
1.Headache	True	432	55.0
	False	236	30.0
	Do not know	118	15.0
2.Fever	True	767	97.6
	False	14	1.8
	Do not know	5	0.6
3.Diarrhea	True	139	17.7
	False	547	69.6
	Do not know	100	12.7
4.Myalgia	True	418	53.2
	False	232	29.5
	Do not know	136	17.3
5.Dry cough	True	749	95.3
	False	19	2.4
	Do not know	18	2.3
6.Runny nose	True	227	28.9
	False	310	39.4
	Do not know	249	31.7
7.Sore throat	True	670	85.2
	False	62	7.9
	Do not know	54	6.9
8.Sneeze	True	460	58.5
	False	238	30.3
	Do not know	88	11.2
9.Dyspnea	True	751	95.5
	False	23	2.9
	Do not know	12	1.5
10.Vomiting	True	89	11.3
	False	570	72.5
	Do not know	127	16.2
11. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19virus.	True	420	53.4
	False	275	35.0
	Do not know	91	11.6
12.There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection.	True	747	95.0
	False	28	3.6
	Do not know	11	1.4
13.What are the COVID-19 risk groups? (A Diabetics + Hypertensive + Obese + Elderly; B Children and pregnant women; C Young people; D Patients with cardiopulmonary pathology; E Cancer patients; F Patients with autoimmune disease; G I do not know)	Option A+D+E+F	319	40.6
	Option A+B+C+D+E+F	162	20.6
	Option A+B+D+E+F	233	29.6
	Option B+C	17	2.2
	Option G	55	7.0
14.What is the virus incubation period?	1-14 days	738	93.9
	More than 14 days	48	6.1
15. Not all persons with COVID-2019 will develop severe cases.	True	642	81.7

	False	102	13.0
	Do not know	42	5.3
16. Eating or contacting wild animals would not result in the infection by the COVID-19 virus.	True	166	21.1
	False	437	55.6
	Do not know	183	23.3
17. Persons with COVID-2019 cannot infect the virus to others when a fever is not present.	True	30	3.8
	False	736	93.6
	Do not know	20	2.5
18. The COVID-19 virus spreads via respiratory droplets of infected individuals.	True	744	94.7
	False	28	3.6
	Do not know	14	1.8
19. What are the forms of transmission of COVID-19? (A. Aerosols; B. Contact with contaminated objects or surfaces followed by contact with the mouth, nose, or eyes; C. Droplets of Saliva; D. Vertical transmission; E. Close contact with people infected by the virus; F. I do not know)	Option A+B+C+E	463	58.9
	Option A+B+C+D+E	148	18.8
	Option A+B	18	2.3
	Option B+E	90	11.5
	Option B+C+D	60	7.6
	Option F	7	0.9
20. Which medical and surgical specialty has the lowest risk?	Dermatologist	220	28.0
	Dentist	34	4.3
	Otolaryngologist	11	1.4
	Anesthetist	31	3.9
	Surgeon	123	15.6
	Intensive care physician	53	6.7
	Internist	62	7.9
	Do not know	252	32.1
21. COVID-19 can be transmitted during dental treatment?	Yes	703	89.4
	No	24	3.1
	Do not know	59	7.5
22.The general population can wear general medical masks to prevent the infection by the COVID-19 virus.	Yes	641	81.6
	No	127	16.2
	Do not know	18	2.3
23.It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	Yes	49	6.2
	No	733	93.3
	Do not know	4	0.5
24.To prevent the infection by the COVID-19 virus, individuals should avoid going to crowded places such as public transport stations and avoid taking public transportation	Yes	746	94.9
	No	31	3.9
	Do not know	9	1.1
25.Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	Yes	763	97.1
	No	15	1.9
	Do not know	8	1.0
26. People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days.	Yes	771	98.1
	No	9	1.1
	Do not know	6	0.8
27. Social isolation is one of the effective ways to prevent infection by COVID-19.	Yes	772	98.2
	No	8	1.0
	Do not know	6	0.8

28. What type of mask is recommended for the health professional who is treating patient infected with COVID-19?	Mask N95/FFP2/ FFP3	578	73.5
	Surgical mask	98	12.5
	Cloth mask	5	0.6
	Mask of cotton	29	3.7
	Do not know	73	9.3
	Others	3	0.4
29.Do you think that/Are the conventional PPE (glove, surgical cap, gown, mask, and glasses protection) are sufficient to prevent contamination of COVID-19?	Yes	322	41.0
	No	426	54.2
	Do not know	38	4.8
30. What rate of importance you attach to measures transmitted by MISAU to prevent spread of COVID-19 in its community?	Nothing important	13	1.7
	Little important	77	9.8
	Important	247	31.4
	Very important	431	54.8
	Do not know	18	2.3
31.What is the best way to diagnose COVID-19?	Molecular tests	537	68.3
	Quick test	122	15.5
	Do not know	127	16.2
32.Who is making the COVID-19 test?	INS (National Health Institute)	488	62.1
	HCM (Maputo Central Hospital)	48	6.1
	MISAU (Ministry of Health)	161	20.5
	Private clinics and laboratories	29	3.7
	Do not know	54	6.9
	Others	6	0.8
33.Which country is currently most affected by COVID-19?	United States of America (USA)	536	68.2
	Italy	191	24.3
	China	25	3.2
	Spain	18	2.3
	Brazil	4	0.5
	Portugal	1	0.1
	Mozambique	1	0.1
	Do not know	10	1.3

Table III: Distribution of knowledge scores by demographic and academic profile

Characteristics		Total knowledge	
		Average	Standard deviation
Gender	Female (527)	23.02	2.87
	Male (259)	23.48	2.94
Age-group (years)	≤19 (201)	22.28	2.72
	20-24 (393)	23.19	2.97
	25-29 (116)	24.03	2.68
	30-34 (53)	24.26	2.63
	≥ 35 (23)	23.83	2.67
Marital status	Single (702)	23.14	2.92
	Non-marital partnership (42)	22.93	2.82
	Married (37)	23.86	2.62
	Divorced (4)	25.00	1.83
	Widowed (1)	26.00	.
University	ISCTAC (52)	24.12	2.45
	ISCTEM (344)	22.77	2.92
	UCM (102)	23.38	3.07
	UEM (111)	24.17	2.54
	UniLúrio (106)	22.65	2.49
	UniZambeze (71)	23.37	3.9
Year	1st (184)	22.38	2.73
	2nd (179)	22.23	3.13
	3rd (143)	23.48	2.67
	4th (146)	24.05	2.61
	5th (107)	23.83	2.62
	6th (27)	25.85	2.09

PERCEPTION

The Table V shows the distribution of students' feelings about the ability of response of national health services to the pandemic caused by COVID-19. Only 2.9% (23/786) of students said they were very confident in the capacity of the national health services, but 56.2% (442/786) of the students said they were not very confident in their ability. About 57.6% students (453/786) reported sadness and 44.5% fear (350/786) due to the pandemic. Few people did not report any

feeling of apprehension during the pandemic (14.4%; 113/786).

Table IV: Results of the perception survey (786)

Perception	Options	n	%
What is your level of confidence in the ability of national health services to respond to the pandemic caused by COVID-19?	Very confident	23	2.9
	Confident	214	27.2
	Not confident	107	13.6
	Little confident	442	56.2
How do you feel about the pandemic?	Fear	350	44.5
	Anxiety	206	26.2
	Panic	166	21.1
	Sadness	453	57.6
	Impotence	220	28.0
	None of the previous	113	14.4

ATTITUDE

The Table VI shows the students degree of hope in controlling COVID-19. About 2/3 of the students (67.3%; 529/786) think that the pandemic will be successfully controlled, while 12.5% (98/786) think the opposite; 83.1% (653/786) think that Mozambique will win this pandemic.

Table VI: Results of the attitude survey (786)

Characteristics	1.Do you agree that COVID-19 will finally be successfully controlled?						2.Do you have confidence that Mozambique can win the battle against the COVID-19 virus?			
	Agree (529)		Disagree (98)		I do not know (159)		Yes, (529)		No (98)	
	n (%)		n (%)		n (%)		n (%)		n (%)	
Gender										
Female (527)	337	63,9	69	13,1	121	23,0	444	84,3	83	15,7
Male (259)	192	74,1	29	11,2	38	14,7	209	80,7	50	19,3
Age-group (years)										
≤19 (201)	123	61,2	31	15,4	47	23,4	179	89,1	22	10,9
20-24 (393)	268	68,2	42	10,7	83	21,1	326	83,0	67	17,0
25-29 (116)	81	69,8	14	12,1	21	18,1	91	78,4	25	21,6
30-34 (53)	41	77,4	5	9,4	7	13,2	42	79,2	11	20,8
≥ 35 (23)	16	69,6	6	26,1	1	4,3	15	65,2	8	34,8

Marital status	Single (702)	473	67,4	82	11,7	147	20,9	594	84,6	108	15,4
	Non-marital partnership (42)	27	64,3	9	21,4	6	14,3	29	69,0	13	31,0
	Married (37)	26	70,3	6	16,2	5	13,5	28	75,7	9	24,3
	Divorced (4)	3	75,0	0	0,0	1	25,0	2	50,0	2	50,0
	Widowed (1)	0	0,0	1	100,0	0	0,0	0	0,0	1	100,0
University	ISCTAC (52)	43	82,7	2	3,8	7	13,5	48	92,3	4	7,7
	ISCTEM (344)	212	61,6	50	14,5	82	23,8	291	84,6	53	15,4
	UCM (102)	74	72,5	12	11,8	16	15,7	89	87,3	13	12,7
	UEM (111)	75	67,6	11	9,9	25	22,5	91	82,0	20	18,0
	UniLúrio (106)	72	67,9	18	17,0	16	15,1	71	67,0	35	33,0
	UniZambeze (71)	53	74,6	5	7,0	13	18,3	63	88,7	8	11,3
Year	1st (184)	124	67,4	24	13,0	36	19,6	159	86,4	25	13,6
	2nd (179)	125	69,8	21	11,7	33	18,4	154	86,0	25	14,0
	3rd (143)	100	69,9	14	9,8	29	20,3	127	88,8	16	11,2
	4th (146)	95	65,1	18	12,3	33	22,6	114	78,1	32	21,9
	5th (107)	65	60,7	19	17,8	23	21,5	77	72,0	30	28,0
	6th (27)	20	74,1	2	7,4	5	18,5	22	81,5	5	18,5

PRACTICE

In Table VII we see that university students have correct practices in relation to the prevention of the pandemic, namely: avoid places with crowds of people (77.9%; 612/786), leaving home in situations of extreme need (96.1%; 755/786) and wearing masks when leaving homes (76.3%; 600/786). Around 75% have adopted all measures to prevent COVID-19 expected to enter the home, except brushing teeth 38.9% (306/786). All the prevention rules recommended to the shopping was fulfilled by most students (57%; 448/786).

Table 5:Results of the practice survey (786)

PRACTICE	Options	n	%
1.In recent days, have you gone to any crowded place?	Yes	174	22.1
	No	612	77.9
2.Are you at home, leaving only in situations of absolute necessity?	Yes	755	96.1
	No	31	3.9
3.In recent days, have you worn a mask when leaving home?	Yes	600	76.3
	No	186	23.7
4.How do you disinfect your hands?	Water + Soap or ash	233	29.6
	Alcohol 70%	93	11.8

	Sodium hypochlorite(undiluted)	2	0.3
	Cetrimide + Chlorhexidine gluconate or chloroxylenol (not diluted)	5	0.6
	Option A + B	403	51.3
	Option A + B+C	42	5.3
	None of the previous	8	1.0
5.What measures did you take after the pandemic to enter your home?	Remove shoes before entering the house	575	73.2
	Putting clothes to wash	638	81.2
	Change clothes	651	82.8
	Take a bath	681	86.6
	Hand wash	766	97.5
	Brush teeth	306	38.9
	Disinfect personal items	654	83.2
6.What you do when you go shopping	a. Wear gloves and masks	39	5,0
	b. Avoid shaking hands or kissing	62	7,9
	c. Social distance of 1.5-2 meters	73	9,3
	d. Option A+C	69	8,8
	e. Option A+B	76	9,7
	All the above	448	57,0
	None of the previous	14	1,8
	No answer	5	0,6

It was found that most of the students surveyed resort to television news and national government (MISAU, INS) to get information about COVID-19 (Figure 3).
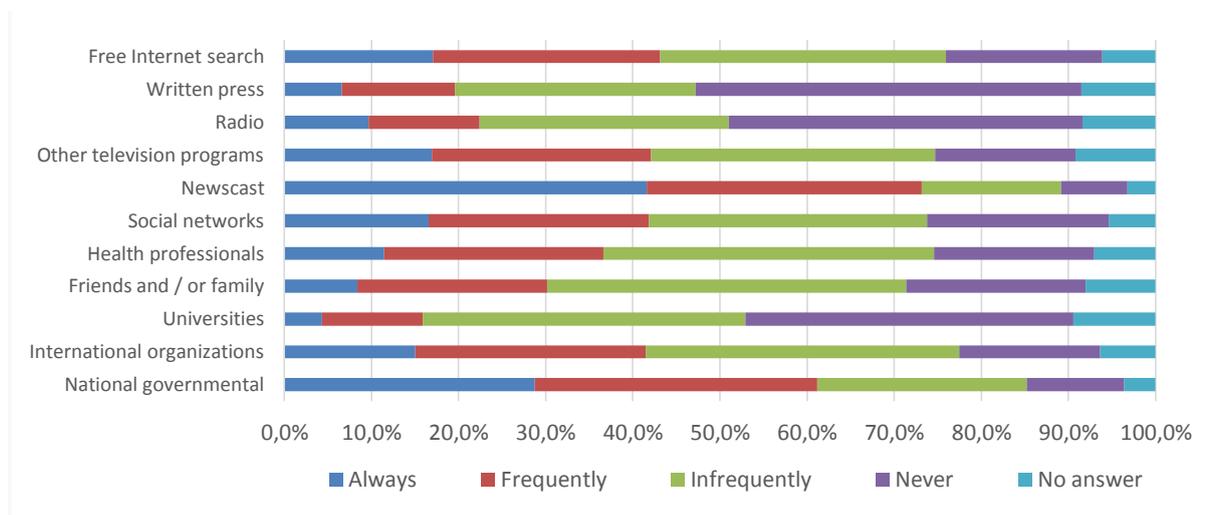

Figure 2: Information sources and channels to stay informed about COVID-19.

DISCUSSION

This study is the first research on KAP (Knowledge, attitude, and practice) related to COVID-19 among student's Mozambican university students from major universities in the country, providing evidence on the situation of information existing among students and their attitudes. The results of this study can help health authorities plan suitable strategies to improve the knowledge of health students' attitudes and practices.

This research has some limitations in interpreting the results because it is a new disease with its knowledge constantly being updated. The scenario is changing every day with the increase in the number of infections and deaths.

In this cross-sectional study involving a cohort of 786 students from the 6 universities in the country, most of the participants were female, coinciding with the study carried out in China (Hubei) (Zhong et al., 2020) , China (Shaanxi) (Peng et al., 2020), Paraguay (Rios-González, 2020), Egypt (Abdelhafiz AS et al., 2020), Vietnam (Giao et al., 2020), Peru (Zegarra-Valdivia et al., 2020), Nepal (Nepal et al., 2020) Jordan (Alzoubi et al., 2020; Khader et al., 2020; Khasawneh et al., 2020), Brazil performed on endodontists (Candeiro et al., 2020) Syria (*NORTHWEST SYRIA: COVID-19 Knowledge, Attitudes and Practices (KAP) Survey*, 2020) Italy (Dilucca & Souli, 2020), Kenya (Austrian et al., 2020), Malaysia (Azlan et al., 2020), Tanzania (Rugarabamu et al., 2020), unlike other studies where there was a male predominance, such as in Bangladesh (Rahman & Sathi, 2020; Wadood et al., 2020), China (Henan)(Zhang et al., 2020), Mozambique(INS, 2020; Manjate et al., 2020), India (Maheshwari et al., 2020; Nazir & Rashid, 2020; Tomar et al., 2020), Uganda (Olum et al., 2020) and Nepal(Asraf et al., 2020).

Most respondents in our survey were less than 30 years old (90.4%), as found in other studies (Abdelhafiz AS et al., 2020; Giao et al., 2020; Khader et al., 2020; Rahman & Sathi, 2020; Rios-González, 2020; Tomar et al., 2020; Wadood et al., 2020; Zegarra-Valdivia et al., 2020) because our target group were young university students. As in other surveys (INS, 2020;

Rahman & Sathi, 2020; Rios-González, 2020; Tomar et al., 2020; Zegarra-Valdivia et al., 2020) most participants are single (89.3%), because ¾ of the respondents were under 24 years of age, attended the 1st year (23.4%), as in the Chinese study (Peng et al., 2020) and did not have the financial capacity to start a family.

Similar studies have been carried out throughout the world, with different target groups, and good levels of knowledge about COVID-19 have been found among the general population, nurses, university students in the field of health, Internet users, university students in general, among others, as shown in the Table XI.

Table VI: Comparison of the level of knowledge between the different studies

Reference	Country	Study population	Average knowledge score	Gender with better knowledge	Degree of knowledge
This study	Mozambique	Students of the superior health schools	70.2 % (23.17 of 33)	Male	Good
(Rahman & Sathi, 2020)	Bangladesh.	Bangladeshi Internet Users	6.35 of 7	Male	----------------
(Hossain et al., 2020)	Bangladesh.	Students of Dhaka	82.85% (10.77/13)	Male	Good
(Zhong et al., 2020)	China (Hubei)	Residents in Hubei	90% (10.8 of 12)	Female	Good
(Peng et al., 2020)	China (Shaanxi)	Students of 10 universities in Shaanxi Province	4.12 (82.34%)	Female	Good
(Abdelhafiz AS et al., 2020)	Egypt	Egyptian adults, who are not working in the medical field	16.39 de 23	Female	Good
(Tadesse, 2020)	Ethiopia	Nurses	9.9 of 18	------------------	Good
(Tomar et al., 2020)	India	General population	80.64% (11.36 of 13)	Male	Good
(Nazir & Rashid, 2020)	India (Kashmir)	Residents of Kashmir	86% (8.6 of 10)	------------------	Good
(Maheshwari et al., 2020)	India (Uttarakhand)	Medical students	----------------	Female	Good
(Dilucca & Souli, 2020)	Italy	Secondary school students	----------------	Quite similar among gender	Good
(Alzoubi et al., 2020)	Jordan	Medical and Non-Medical University	0.81	-----------------------	Good

		Students			
(Khasawneh et al., 2020)	Jordan	Six medicals schools in Jordan	--------------------	-----------------------	Good
(Azlan et al., 2020)	Malaysia	Malaysian public	80.5% (10.5/13)	Female	Good
(Nepal et al., 2020)	Nepal	Healthcare workers in Chitwan	82.15% (21.65)	Male	Good to moderate
(Isah et al., 2020)	Nigeria (Katsina)	General population	>70%	Female	Good
(Rios-González, 2020)	Paraguay	Paraguayan nationals	62% (7.45)	Female	Acceptable
(Austrian et al., 2020)	Kenya	Five urban slums in Nairobi	-----------------	------------------	High
(Rugarabamu et al., 2020)	Tanzania	Tanzanian residents	77.5% (9.3 of 12)	Female	Good
(Olum et al., 2020)	Uganda	Health Care Workers at Makerere University Teaching Hospitals	82.4%	Male	Sufficient
(Giao et al., 2020)	Vietnam (Ho Chi Minh)	Healthcare workers at District 2 Hospital	81.7% (8.17 of 10)	Male	Good

This evidence is very similar to what we found in this research, where university students in the health sector in Mozambique had good levels of knowledge (70.2%).

This investigation showed that male students have a slightly higher score on knowledge unlike other studies (Abdelhafiz AS et al., 2020; Azlan et al., 2020; Isah et al., 2020; Peng et al., 2020; Rios-González, 2020; Rugarabamu et al., 2020; Zhong et al., 2020). It is assumed that the good level of knowledge is the result of awareness campaigns carried out by the country's health authorities by using all available means of communication, from large cities to the interior of the districts and administrative posts and also because the target group are health care students.

As in the Kenyan (Austrian et al., 2020) survey, more than half of the health students in our study mistakenly reported sneezing as one of the symptoms of COVID-19. Currently, with

the increase in knowledge regarding COVID-19, WHO has described that the most common signs are fever, dry cough, and fatigue (WHO, 2020a).

Almost all participants know that there is no effective cure for COVID-19 and symptomatic and early supportive treatment can help the infected recover. These findings are similar to other studies (Azlan et al., 2020; Isah et al., 2020; Maheshwari et al., 2020; Olum et al., 2020; Zhong et al., 2020).

More than ¾ of the students in this study state that there is a risk that COVID-19 is transmitted during dental treatment. Similar results were observed in a Brazilian study in which the target group were endodontists (Candeiro et al., 2020), because most dental treatments require the use of rotary instruments that produce aerosols that may contain water, saliva, blood, microorganisms or other debris, the dentist's intimate exposure to the aerodigestive route and the absence of distance between the doctor, patient and assistant. However, the Centers for Disease Control and Prevention (CDC) says that to date there is no data available to assess the risk of transmission of SARS-CoV-2 during dental practice (CDC, 2020). Almost all the students reported that isolating and treating infected people reduces the spread of the virus. Similar results have been observed in studies from Malaysia (Azlan et al., 2020), Bangladesh(Hossain et al., 2020), Tanzania (Rugarabamu et al., 2020), India (Maheshwari et al., 2020) , Nigeria (Isah et al., 2020), China (Zhong et al., 2020)and Uganda (Olum et al., 2020).

Mozambican university students know that individuals who have had contact with positive COVID-19 patients must immediately comply with a 14-day quarantine; similar results have been observed in other series (Azlan et al., 2020; Hossain et al., 2020; Isah et al., 2020; Maheshwari et al., 2020; Olum et al., 2020; Rugarabamu et al., 2020; Zhong et al., 2020)

Most respondents to this survey stated that the INS was the laboratory in charge of carrying out the COVID-19 tests. At the time of data collection, this statement was true, however, after a few months of evolution of the disease, some Mozambican laboratories started carrying out these tests, such as the laboratory of the Private Hospital of Maputo, Manhiça Research Center, and

others.

An interesting finding is that most participants in our investigation have a positive attitude towards COVID-19. Similar results have been observed in other investigations in Vietnam (Giao et al., 2020), China (Zhong et al., 2020), India (Maheshwari et al., 2020), Malaysia (Azlan et al., 2020), Tanzania (Rugarabamu et al., 2020) and Paraguay (Rios-González, 2020), but in the Bangladesh study (Rahman & Sathi, 2020) the respondents showed negative attitudes.

Most students had prudent practices avoiding places with crowds of people, reflecting the deep knowledge about the importance of social distance in the prevention of this pandemic. The same happened with other studies from Nepal (Asraf et al., 2020), China (Zhong et al., 2020), Malaysia (Azlan et al., 2020), Jordan (Khasawneh et al., 2020), Tanzania (Rugarabamu et al., 2020). A study of students in Bangladesh showed that 40% of them do not wear a mask because it is very expensive (Wadood et al., 2020). The Mozambican survey (Munguambe et al., 2020) reported the lack of physical distance between people on the public road.

Almost all students left home only in cases of absolute necessity. Similar findings were observed in the Portuguese social study (Barómetro Covid-19 ENSP-NOVA, 2020).
More than ¾ of the students wore masks when leaving home, as in studies in Uganda (Olum et al., 2020), Bangladesh (Hossain et al., 2020), China (Zhong et al., 2020), Bangladesh(Rahman & Sathi, 2020; Wadood et al., 2020) Nigeria (Isah et al., 2020), Malaysia (Azlan et al., 2020), Jordan (Khasawneh et al., 2020) and Tanzania (Rugarabamu et al., 2020).

In studies carried out in other countries such as Nigeria, Egypt, Jordan, Vietnam, most respondents reveal using social media to obtain information related to COVID-19, while in our study, respondents reported using News Programme and National Governmental.

Table VII: Comparison of information sources used to obtain information about COVID -19 in different studies.

Reference	Study population	Country	Information sources
This study	Students of the superior health schools	Mozambique	News Programme, National Governmental
(Manjate et al., 2020)	Public Employees	Mozambique	Social networks, radio, and television
(Giao et al., 2020)	Healthcare workers at District 2 Hospital	Vietnam	Social media and the Ministry of Health website
(Dilucca & Souli, 2020)	Secondary school students	Italy	Television
(Austrian et al., 2020)	Five urban slums in Nairobi	Kenya	Government TV ads, SMSs Government and radio ads
(Khasawneh et al., 2020)	Six medicals schools in Jordan	Jordan	Social media and online search engines
(Alzoubi et al., 2020)	Medical and Non- Medical University Student		Social media, internet, and television
(Isah et al., 2020)	General population	Nigeria (Katsina)	WhatsApp, other social media, other national TV stations and Internet browsing
(Abdelhafiz AS et al., 2020)	Egyptian adults, who are not working in the medical field	Egypt	Social media, the internet followed by TV/satellite channels

CONCLUSION

The present study thus showed that the knowledge about COVID-19 in future Mozambican health professionals during the outbreak was satisfactory, attitudes have been very favorable, and practices are mostly suitable. Nevertheless, it is still essential to implement gigantic instruction crusades in the general population, to increase knowledge about COVID-19 and, above all, attitudes, and practices, to stop its spread.

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Conflicts of interest

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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ANEXO

Comité Institucional de Bioética em Saúde da
Faculdade de Medicina/Hospital Central de
Maputo

(CIBS FM&HCM)

Dra. Jacinta Silveira, Presidente do Comité Institucional de Bioética em Saúde da Faculdade de

Medicina/Hospital Central de Maputo (CIBS FM&HCM)

CERTIFICA

Que este Comité avaliou a proposta do (s) Investigador (es) Principal (is):
Nome (s): Abdul Habib Mahomed Dadá
Protocolo de investigação: Versão 4 de Abril de 2020
Consentimentos informados: Sem versão e sem data
Questionários: Sem versão e sem data
Guião de entrevista: N/A

Do estudo:
TÍTULO: "Conhecimentos, atitudes e práticas dos estudantes das escolas superiores de saúde das Universidades Moçambicanas sobre COVID-19"

E faz constar que:
1º Após revisão excepcional pelos membros do Comité do protocolo durante a reunião do dia 16 de Abril de 2020, e que foi incluído na acta nº 03/2020, o CIBS FM&HCM, emite este informe notando que não há nenhuma inconveniência de ordem ética que impeça o início do estudo.
2º A revisão se realizou de acordo com o Regulamento do Comité Institucional da FM&HCM – emenda 2 de 28 de Julho de 2014.
3º Que o protocolo está registado com o número CIBS FM&HCM/025/2020
4º A composição actual do CIBS FM&HCM está disponível na secretária do Comité.
5º Não foi declarado nenhum conflito de interesse pelos membros do CIBS FM&HCM.
6º O CIBS FM&HCM faz notar que a aprovação ética não substitui a aprovação científica nem a autorização administrativa.
7º A aprovação tem validade de 6 meses e termina a 15 de Abril de 2020. Um mês antes dessa data o Investigador deve enviar um pedido de renovação se necessitar.
8º Recomenda aos investigadores que mantenham o CIBS informado do decurso do estudo no mínimo uma vez ao ano.
9º Solicitamos aos investigadores que enviem no final de estudo um relatório dos resultados obtidos.

E emite
RESULTADO: APROVADO
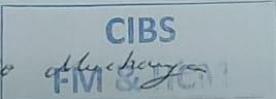
Assinado em Maputo aos 16 de Abril de 2020

Faculdade de Medicina, Av. Salvador Allende nº702, telefone: 21428076 www.cibs.uem.mz Página 1 de 1