NAPATA COLLEGE

SCHOOL OF

MEDICINE

DEPARTMET OF COMMUNITY MEDICINE

Knowledge, Attitude, and Practice of Napata College's Medical Studentstowards COVID-19 vaccines, 2021

A research submitted for partial fulfillment for the award of the degree of (MBBS) in school of medicine in Napata College

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قال تعالى :

قَالُواْ سُبْحَٰنَكَ لَا عِلْمَ لَنَآ إِلَّا مَا عَلَّمْتَنَآ إِنَّكَ أَنتَ ٱلْعَلِيمُ ٱلْحَكِيمُ

صدق الله العظيم

Dedication

Undoubtedly, a work like this is nearly impossible to commence without the selflessness of a plethora of people.

I would like to dedicate this work to my late parents:

My Father..Gamal Gadallah Mohammed (1957-

2020)My Mother Somaya Ibrahim (1967-2019)

If it were not for their unparalleled sacrifice, I would not have found myself in this privileged, statistically unlikely, and fortunate position. May the rest in everlasting peace (Amen).

I would also like to dedicate this work to all those whom were with me during the tumultuous years of study. Friends, family, and colleagues.

To all of you, from the bottom of my heart

Acknowledgements

I am very thankful to the administration of Napata College for their immense support throughout the years.

My supervisor, Dr. Moneer, has selflessly offered advice day-in and day-out through the conduction of this research.

The participants were extremely kind and mindful of the value research provides in the evolution of our understanding of ourselves.

For their efforts, a sincere gratitude is required.

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List of Abbreviations:

WHO = World Health Organization MLS = Medical Laboratory Sciences IT = Information Technology

SPSS = Statistical Package for Social SciencesSARS = Severe Acute Respiratory Syndrome MERS = Middle East Respiratory Syndrome

Abstract

Introduction:

In December of 2019, the first case report of what later would be identified as COVID-19 was made . Little did anyone know that the illness would evolve to what it has. Now, we thankfully have a number of vaccines available on the market to address the ever-rising issue.

Research Aim:

To assess the Knowledge, Attitude, and Practice of Napata College's Medical Students Towardsthe COVID-19 vaccines in of 2021.

Research Methodology:

This was a cross-sectional KAP study that took place in the Napata College campus.

Results:

A total of 107 participants answered our questionnaire.

Most of our respondents (69.2%) were female and were in their 1st year of medical school (39.3%)**.** They illustrated a low vaccination rate amongst the participants as well as a rather poor attitude (35.8% of our participants would not recommend someone else receive the vaccine).

Conclusion:

In conclusion, this research project has found that the majority of Napata College junior medical students (defined as those who have yet to initiate their clerkships) were not vaccinated. We have also found that a considerable percentage have been previously infected with COVID-19. If this is an indicator, it is an indicator of a disaster to come especially given the recent high-spreading **Omicron** variant of the illness. This illustrates the need for immediate, well-thought out interventions with the end-goal of putting an end to the pandemic that has taken the world by storm.

ملخص البحث

مقدمة :في ديسمبر من عام ، 2019تم إعداد أول تقرير حالة لما سيتم تحديده لاحًقا على أنهكوفيد-19 لم يعلم أحد أن المرض سيتطور إلى ما هو عليه. الآن ، لحسن الحظ لدينا عدد من اللقاحات المتاحة في السوق لمعالجة المشكلة المتزايدة باستمرار..

اهداف البحث: هدف البحث لتقييم معرفة وموقف وممارسة طلاب الطب بكلية نبتة تجاه لقاحات COVID-19 في عام 2021

منهجية البحث :كانت هذه دراسة مقطعية ومعرفية وعلمية تمت في حرم كلية نبتة.

الخلاصة:

في الختام ، وجد هذا المشروع البحثي أن غالبية طلاب كلية الطب المبتدئين في كلية نبتة (الذين تم تعريفهم بأنهم أولئك

الذين لم يبدأوا تدريبهم بعد (لم يتم تطعيمهم. لقد وجدنا أيضا أن نسبة كبيرة من الأشخاص أصيبوا سابًقا بكوفيد-19إذا كان هذا مؤشًرا ، فهو مؤشر على وقوع كارثة خاصة بالنظر إلى وجود متغير اوميكرون عالي الانتشار ف المرض وتوضح هذه الحاجة إلى تدخلات فورية ومدروسة جيًدا بهدف نهائي يتمثل في وضع حد للوباء الذي عصف بالعالم.

CHAPTER ONE

Introduction

In December of 2019, the first case report of what later would be identified as COVID-19 was made (1). Little did anyone know that the illness would evolve to what it has. Now, we thankfully have a number of vaccines available on the market to address the ever-rising issue.As per a paper discussing vaccinations in Africa:

'Many countries in Africa are unable to reach the target endorsed Global Vaccine Action Plan (GVAP)' (2). Despite the paper not discussing the COVID-19 vaccine per say, it clearly illustrates an issue regarding the distribution of vaccines throughout the continent. As per a study discussingCOVID-19 vaccines:

COVID-19 is a pandemic of unprecedented proportions in recent human history. Less than 18 months since the onset of the pandemic, there are close to two hundred million confirmed cases and four million deaths worldwide. There have also been massive efforts geared towards finding safe and effective vaccines. By July 2021 there were 184 COVID-19 vaccine candidates in pre- clinical development, 105 in clinical development, and 18 vaccines approved for emergency use by at least one regulatory authority. These vaccines include whole virus live attenuated or inactivated, protein-based, viral vector, and nucleic acid vaccines. By mid-2021 three billion doses of COVID-19 vaccine have been administered around the world, mostly in high-income countries. COVID-19 vaccination provides hope for an end to the pandemic, if and only if there would be equal access and optimal uptake in all countries around the world.' (3).

Until 2020, the primary concern regarding COVID-19 was the development of a vaccine, as per a2020 NEJM paper (4):

'The need to rapidly develop a vaccine against SARS-CoV-2 comes at a time of explosion in basic scientific understanding, including in areas such as genomics and structural biology, that is supporting a new era in vaccine development.'

As per the same article, 'Vaccines for severe acute respiratory syndrome (SARS), Ebola and Zika did not follow a similar path. The SARS and Zika epidemics ended before the vaccine development was complete, and federal funding agencies [referring to those of the United States' government] reallocated funds that had been committed to vaccine development, leaving manufacturers with financial losses and setting back other vaccine-development programs (4).

As per a US-based study, 'Vaccination rates in medical students present concerns both for both patients and public safety and may reflect the attitudes of future physicians.' (5). The same paper also reported, 'there was a significant difference between vaccinated and unvaccinated groups regarding COVID-19 testing, suggesting that those who are vaccinated are more likely to have been tested for COVID-19.This suggests that many students who did not have strictly "pro- vaccine" attitudes or behavior likely demonstrate vaccine hesitancy rather than outright opposition. Furthermore, it is possible that additional training, information, and clinical exposure will motivate those who are uncertain about vaccination to have more "pro-vaccine" attitudes and behaviors. For example, there was 1 instance of a student who had not received childhood vaccinations who received the COVID-19 vaccine, suggesting that family attitudes about or childhood exposure to vaccines do not necessarily predict future vaccination behaviors.' (5).

Problem Statement

Sudan is an African nation, and as per a study regarding the distribution of vaccines in the continent, 'this review of MOV in Africa shows that the prevalence of MOV [Missed Opportunities for Vaccination] varies across the continent with some African settings having more than 90% MOV. The review shows that the varying MOV prevalence and its determinants among African countries may need different approaches to address MOV problem in each setting's peculiarities' (2).

Justification

COVID-19 has taken the world by storm. It is, in our estimation, the most widely-covered (by the media) illness in modern history. Recently, a number of vaccines have been introduced with the sole objective of seeing to it that life returns to 'normal'. However, it remains unclear how much acceptance these vaccines will receive. Ergo, it is of the upmost importance that we see to it that this topic is addressed.

Research ObjectivesGeneral objective

To assess the Knowledge, Attitude, and Practice of Napata College's Medical Students Towards the COVID-19 vaccines in of 2021

Specific objectives

- To assess the knowledge levels of Napata College's medical students regarding the COVID-19vaccines
- To assess the attitude of Napata College's medical students towards the COVID-19 vaccines(willingness to receive the vaccine)
- To assess the practice of Napata College's medical students towards the COVID-19 vaccines(willingness to recommend the vaccine to others).

CHAPTER TWO

LETRETURE REVIEW

In the history of vaccines, COVID-19 vaccines have accelerated at an unimaginable speed.' (3) The history of vaccines date back to 1796 and the development of the smallpox vaccine by Jenner (6).

COVID-19 is probably the world's best covered illness (in so far as media coverage is concerned). It is now, as they say, the 'talk of the hour'. The entirety of the planet is looking at solutions to this issue that has plagued it for over 2 years now and a plethora of research efforts are taking place to see to it that this goal is met. Unfortunately, this has shed light on the fact that we, as a species, face the issue of being short-sighted. Given the previous SARA and MERS episodes, we should've been prepared for such an occurrence (1). However, we found ourselves underprepared and highly afraid. Furthermore, the actions set forth by a plethora of individuals, many of whom were, and still are, in positions of power have set us back in our effort to combat this pandemic. Fortunately, many are now seeing into their shenanigans and are now seeing through them.

As per the title of a South African piece 'Conspiracy theories on Covid-19 vaccine can be as deadlyas virus itself' (7).

As per the piece he common conspiracy theories include that Bill Gates is trying to control the world by implanting microchips in the Covid-19 vaccine; the vaccine will be used to kill Africans as part of an age-old population control plan; big pharmaceutical companies created the virus to profit billions from supplying the vaccine; Covid-19 comes from 5G towers; and so on.

These, and other fears, have dominated social media conversations in South Africa and across the world for the past few months as Covid-19 vaccines were being tested. The concerns have intensified in the past few weeks now that the vaccines are being rolled out.

As South Africa finds itself in the midst of a deadly, second Covid-19 surge, and the first batch of vaccines is on its way to our country, it is alarming that some of these conspiracies and misinformation originate from high profile individuals. Some leaders have suggested any vaccine not developed in Africa should be rejected and Africans should rely on alternatives such as indigenous herbs.' (7).

In December of 2019, the first case report of what later would be identified as COVID-19 was made (1). Little did anyone know that the illness would evolve to what it has. Now, we thankfullyhave a number of vaccines available on the market to address the ever-rising issue.

As per the World Health Organizatio (WHO), the 'first mass vaccination programme' took place in December of 2020(8).

However, this has given rise to a new conundrum, that being the public's willingness to accept said vaccine. For example, a paper by Mangla and colleagues reported the following '. The Knowledge score mean was 24 (out of 46), Attitude score 28.9 (out of 55), and Practice score 7.3 (out of 11). Almost 65% of the respondents reported being knowledgeable about COVID-19 variants and vaccination, 55% reported a positive attitude toward available COVID-19 vaccines, and 85% reported engaging in practices that supported COVID-19 vaccination' (9). However, in Nigeria, a country closer to Sudan, a paper reported an overall good/positive attitude towards the COVID-19 vaccines (10).

Unfortunately, the miscommunication of information is a rather serious issue. Findings suggest that knowledge is directly associated with attitude towards the vaccine (11).

Findings from Greece suggest the public are unwilling to participate in vaccination efforts (12).As per a study out of Germany and Chile:

'countries with low vaccine availability cannot vaccinate the drivers of contagion and thus face a double problem. First, they cannot de facto protect the population at risk, and second, they cannot fully restart their economic activities since they would require NPIs to mitigate the spread of COVID-19, given the low immunity levels across the population. Therefore, differences between vaccination programs will make countries that are already at economic antipodes drift further apart.

Since mid-2021, vaccine availability does not pose a problem in high-income countries. Instead, these countries face the challenge that vaccine-hesitant and vaccine-denial individuals pose to thetimely completion of vaccination programmes.'(13).

A paper from neighboring Oman concluded that 'The history of chronic disease, source of vaccine knowledge, and education level were factors that affected the willingness to accept the vaccine.' (14). The same article illustrates the following:

'Oman is globally acknowledged for its well-structured immunization program with high

vaccination coverage. The massive spread of misinformation brought on by the COVID-19 pandemic, as well as the easy access to various media channels, may affect acceptance of a vaccine, despite the inherent trust in the local system. This cross-sectional study evaluated the knowledge, attitudes, and practice (KAP) in Oman toward COVID-19 vaccines. It included 3000 randomly selected adults answering a structured questionnaire via telephone. Participants were ….83.7% without comorbidities. Their mean age was 38.27 years.Knowledge of COVID-190s symptoms, mode of transmission, and attitudes toward the disease was adequate; 88.4% had heard of the vaccine, 59.3% would advise others to take it, 56.8% would take it themselves, and 47.5% would take a second dose. Males and Omani were more willing to be vaccinated. The history of chronic disease, source of vaccine knowledge, and education level were factors that affected the willingness to accept the vaccine. The Omani community's willingness to take the COVID-19 vaccine can be enhanced by utilizing social media and community influencers to spread awarenessabout the vaccine's safety and efficacy.' (14).

Oman is an Arab country and is highly similar to Sudan in so far as language and culture are concerned, which is why we thought it important to carefully look into the results reported in the study.

A report from mainland China illustrated high willingness to participate in vaccination efforts (15). Given these rather contradicting findings from across the world, it is of the upmost importance thatwe collect data in our nations and use these to influence public health policies.

A study out of Tunisia reported some rather intriguing data, '28.3% (n = 93) reported to definitely refuse the vaccine and 21.2% (n = 70) did not make their decision yet. High educational level, history of comorbidities, history of influenza vaccination in the current season, and patient's opinion about the severity of COVID-19 did not predict vaccine resistance.'(16)

A study conducted in New York reported the following 'Vaccine preferences in this New York State disability community sample align with national data. Identified concerns suggest the need for community education that addresses misperceptions. Age and race differences in perspectiveshighlight the need for tailored education, delivered by trusted messengers.'(17).

A notable limitation is the fact that Sudan is a Lower-income nation, one of many which have issues of distribution of vaccines (18).

As per the authors of a Nature Medicine article:

‘The world shares a collective responsibility in fighting this pandemic; therefore, continued research on COVID-19 vaccine acceptance and hesitancy should be a priority. Such research should then be used to inform contextualized campaigns and information-sharing that will ultimately result in increased confidence in and uptake of available vaccines.’ (19)

A study conducted amongst US medical students reported rather positive attitudes towards vaccines (20). This raises concern as there may be a socio-economic factor at play indicating the need for immediate intervention in this regard.

A study out of Norway and Ethiopia concluded the following ‘Addressing problems related with risk degree, educational status, and socio-demographic factors will help to increase the overall knowledge and attitude towards second COVID-19 vaccine doses.’(21).

A study took place in the United States of America (USA), in Texas Tech University Health Science Center in Lubbock, TX to be exact (5). The study found that the vast majority of students at the institute (91.8%) were vaccinated against COVID-19. Furthermore, the same study illustrated that the participants were showed ‘pro-vaccine’ attitudes (5). This is important as it illustrates a positive trend towards bringing an end to the pandemic that has taken the world by storm.

As per a multi-centered French study, ‘The crude willingness to get vaccinated against COVID-19 (including already vaccinated respondents) was 53.2% overall’ (22). This is rather alarming as it indicates that a considerable percentage of healthcare workers are unwilling to receive the vaccination.

A Wuhan-based study reported some rather frightening results such as a 58.2% hesitancy rate amongst medical students regarding the COVID-19 vaccination (23).

A study out of Uganda reported a 30.7% hesitancy rate amongst medical students in the area, the study took place shortly after nation-wide availability of the AstraZeneca vaccine (24).

In neighboring Ethiopia, at least one study shows that nearly 30% of university students (was notspecific to medical students) were at least hesitant towards COVID-19 vaccines (25).

According to a study out of the US:

‘In this global assessment including 19 studies across 39 countries, the overall rate of COVID-19 vaccination hesitancy among 19,991 students/ trainees of healthcare professions was 18.9%. This rate of COVID-19 vaccination hesitancy (almost one fifth) in students and trainees almost mirrorsthe rate in practicing healthcare professionals’ (26)

CHAPTER THREE

METHODOLGY

3.1. Study design

Descriptive cross-sectional KAP study

3.2. Study setting

Napata College, Bahri, Khartoum, Sudan. Napata College was first established in 2015, it is primarily medical in nature. The college has 2 campuses, both situated in the state of Khartoum, one in Khartoum city (this is house to the schools of pharmacy and information technology), and one in Bahri city (this campus is larger in size and is house to the remaining programs). The Khartoum city campus is located in Al-Riyadh, Block 10, property no. 151, while the Bahri city campus is located in Kafouri, northwest of Al-Qantara traffic light. In addition to housing the majority of the College's programs, the Bahri campus is also home to the Dean's office and servesas the headquarters for the college's research and innovation center.

The total number of medical students attending Napata College is ~600, while the entirety of the college is home to approximately 1,000 students. The college's administration has recently revealed plans regarding the initiation of a school of business administration. It seems as if that will be situated in the Khartoum city campus.

3.3. Study Population

All students enrolled in Napata College's School of Medicine

3.3.1. Inclusion criteria

All students enrolled in Napata College's School of Medicine

3.3.2. Exclusion criteria

- Participants who chose 'no' on the 'I consent to participation in this research' element ofthe questionnaire
- Participants who are not students of Napata College

3.4. Sampling Methods / Techniques (Specify)

This was a multi-stage systematic sampling targeting Napata College's medical students. The systematic sampling took place in the following manner:

- We gave the participants numbers (so as to assure confidentiality) (on basis of 2)

- These numbers were placed into an online random number generator
- The numbers picked by the generator were sampled

For example, the numbers 8, 17, 22, 25, 60, 99, 77, and 32 were inserted into the generator; the generator will pick one half of them (e.g.: 8, 25, 77, 32); following this, participants with these numbers were sampled.

- The sample size was calculated based on the equation below.

Equation: $n = \frac{N}{1+N} (D)^2$

n = Sample size

D = Degree of

PrecisionN =

Sample

3.5. Sample size

107

3.6. Study variables:

Age, Gender, Vaccinated or not

3.7. Data Collection Tools

A questionnaire was created using Google Form to see to it that no data is missing.Following this, the data was analyzed using SPSS v.26 and the results were reported.

3.8. Data Analysis

The collected data was organized, tabulated and analyzed by using descriptive and inferential statistical methods wherever required. The descriptive statistics like percentage, mean, SD and inferential statistics like correlation and coefficient were used. Furthermore, the analyzed data waspresented in the form of tables, figures and diagrams.

3.9. Ethical Consideration

The author hereby declares no conflict of interest. The proposal to this research was run by NapataCollege's ethical committee prior to the commence of the research.

CHAPTER FOURRESULTS

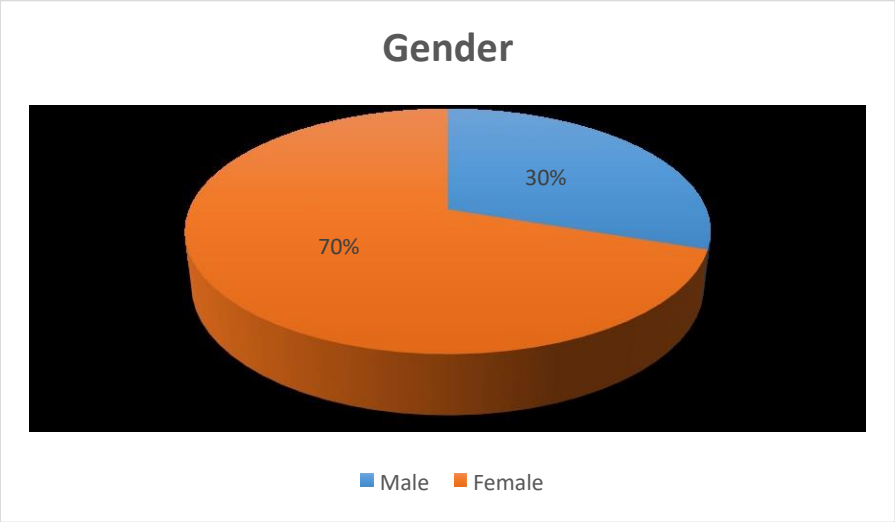

Fig.1 *Distribution of the participant among gender (N= 107)*

Most of our respondents (69.2%) were female and were in their 1st year of medical school(39.3%)

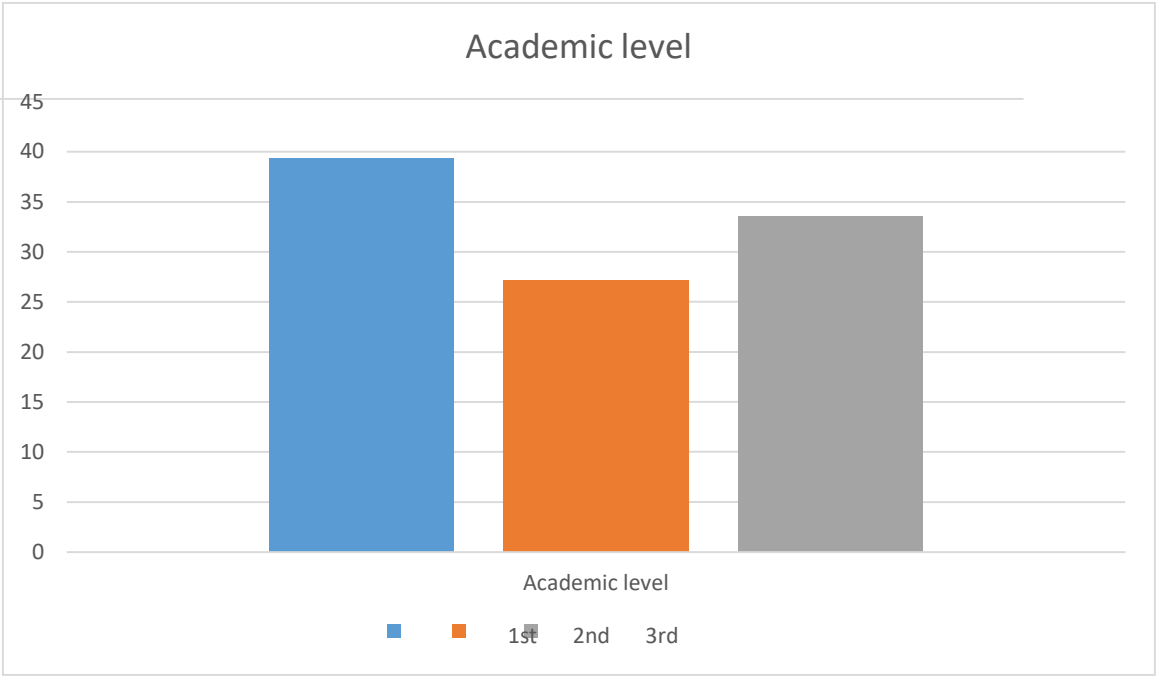

Fig.2: *Distribution of the participant among academic level (N= 107)*

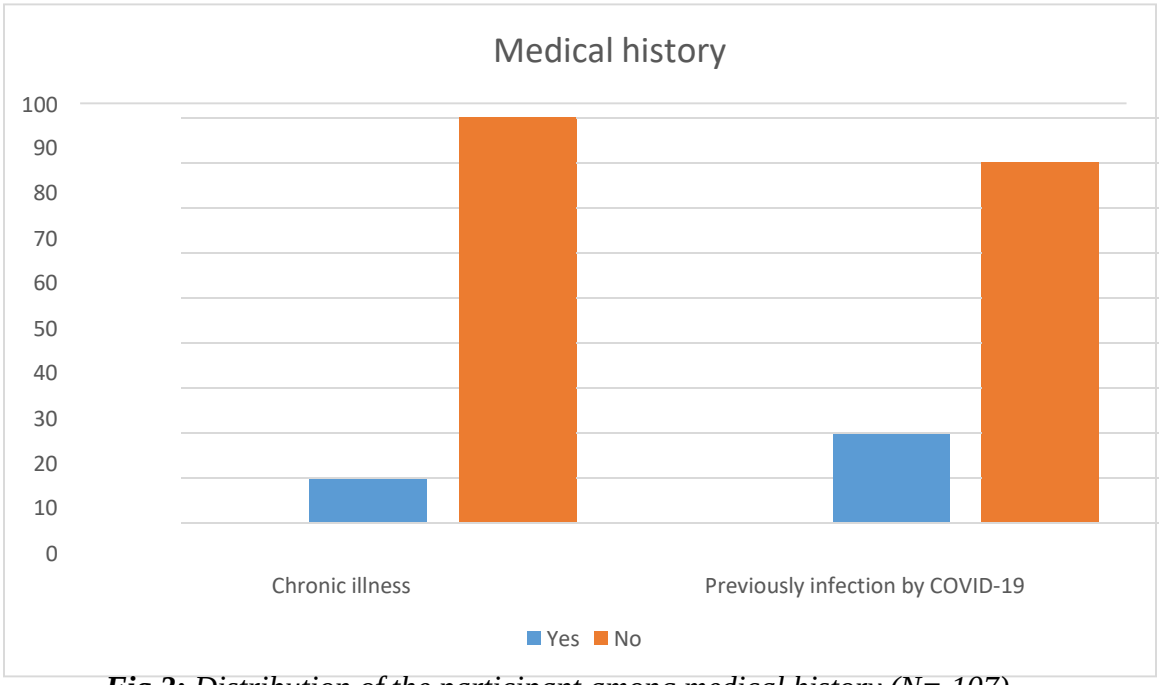

Fig.3: *Distribution of the participant among medical history (N= 107)*

In total, 88% of our participants had no history of any chronic illness. 18.7% of our participants hadpreviously been infected with COVID-19, while 79.4% had never been infected with COVID-19.

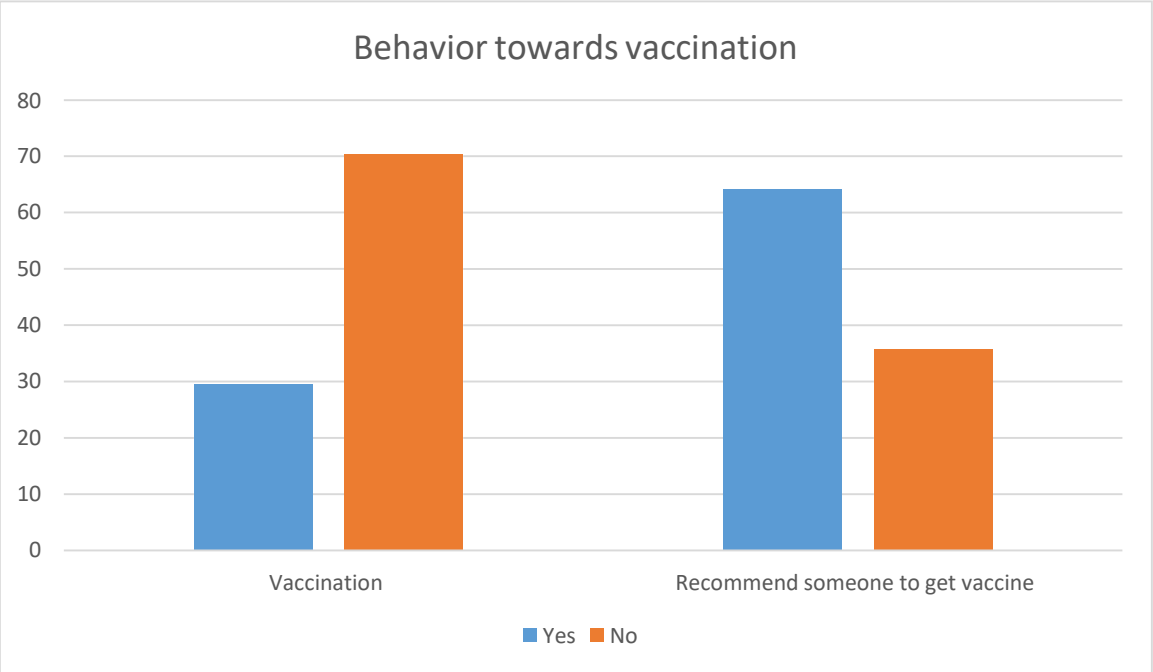

Fig.4: Distribution of the participant among Behavior towards vaccination (N= 107)

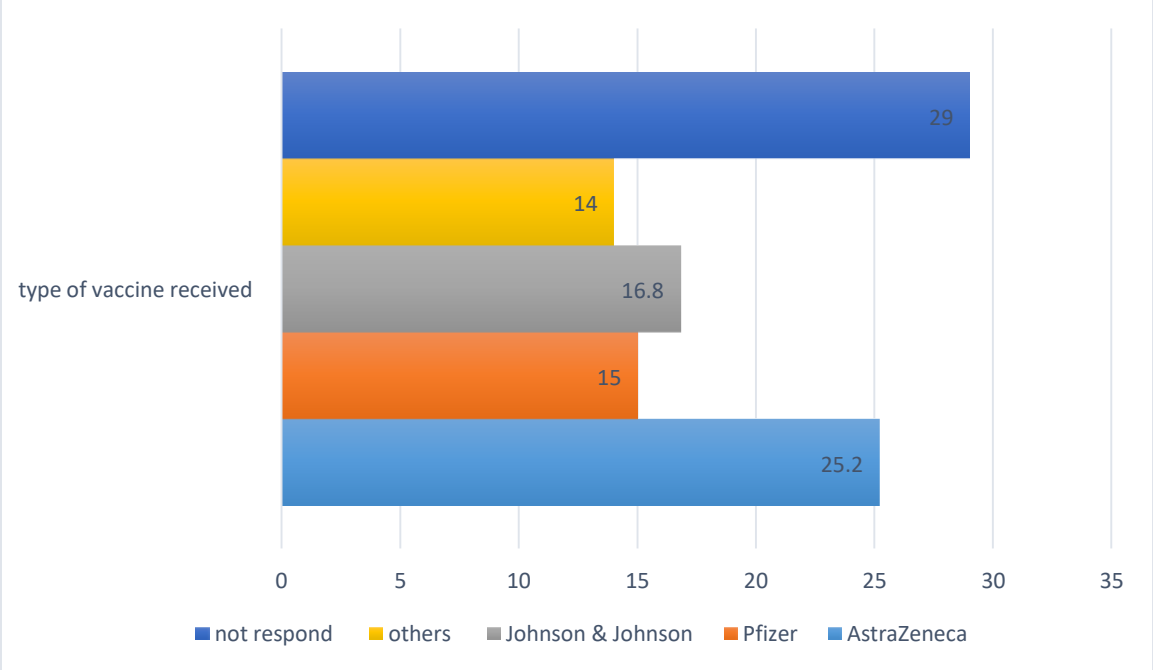

Fig.5: Distribution of the participant among type of vaccine (N= 107)

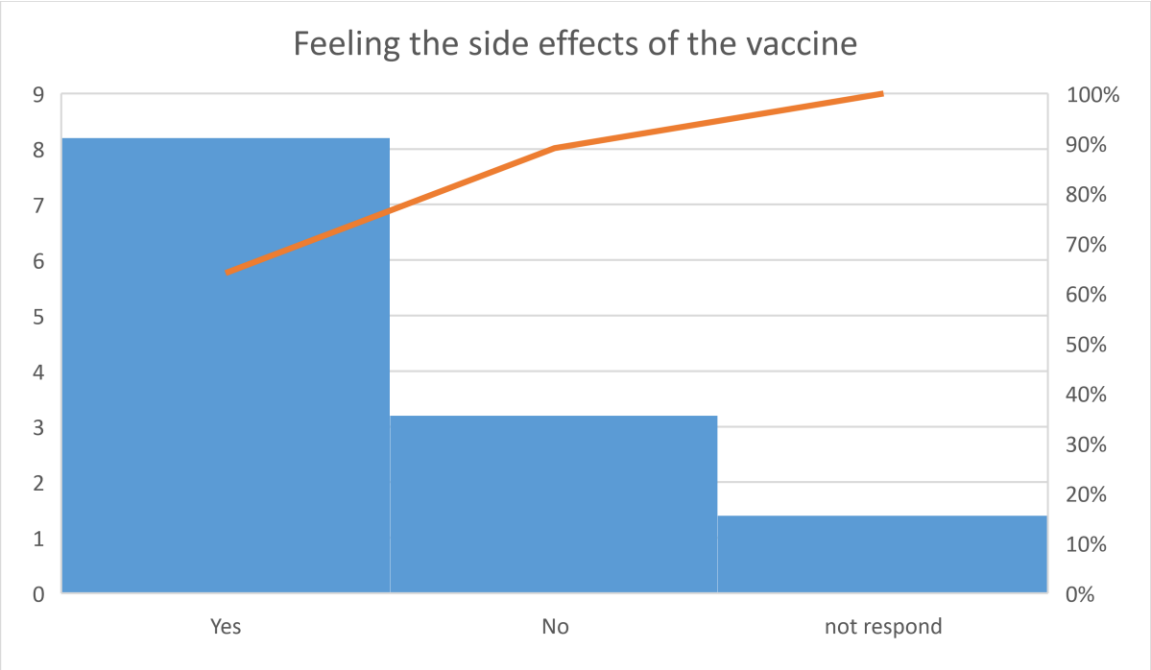

Fig.6: Distribution of the participant among feeling side effects of vaccine (N= 107)

The most common reported fear regarding the COVID-19 vaccine is side effects, followed by governmentspying software

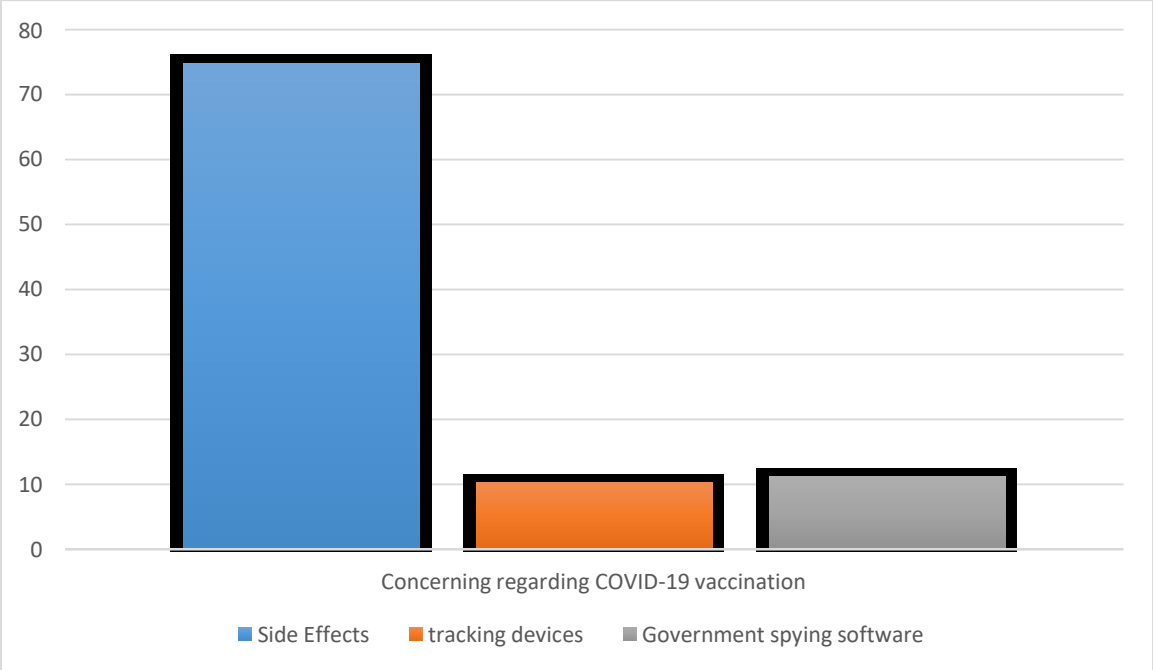

Fig.7: Distribution of the participant among concerning regarding COVID-19 vaccination (N= 107)

Table 1: Participant health information

Health information	Respond %		P value
	Yes	No	
Chronic illness	9.3	90.7	.075
Previously infection by COVID-19	18.7	81.3	.085
Getting vaccine	29.5	70.5	.053
Recommend someone to get vaccine	64.2	35.8	.045

P value significant at (.05,.01**,.001***)*

Table 2: *types of vaccine getting by participant*

Type of vaccine	Percent	P value
AstraZeneca	25.2	.006
Pfizer	15	.003
Jonson & Jonson	16.8	.001
Others	14	.002

P value significant at (.05,.01**,.001***)*

An overall good attitude (60.3% responded positively) was reported by our participants (this was assessed by asking the participant whether or not they would recommend someone else get vaccinated). Most of our participants who were vaccinated received the AstraZeneca vaccine.

Table 3: *Concerning regarding COVID-19 vaccination*

Feeling	**Percent %**	**P value**
Side effect	74.8	.282
Tracking devices	10.3	.272
Governmental spying software	11.2	.252

P value significant at (.05,.01**,.001***)*

The vast majority of our participants were not vaccinated (i.e. received at least 1 dose of anyauthorized vaccine). Nearly 30% of our participants did not answer this question.

CHAPTER FIVE
DISSCUSSION

These results are in line with results reported from studies that took place prior to the authorization of vaccines for COVID-19. For example, a US-based study, by Lucia and colleagues reported a 23% disapproval rating amongst medical students (20)

As aforementioned, this study showed some rather alarming findings, such as the rather low percentage of vaccinated medical students. These findings are not in line when compared to the results reported regarding medical students in the US (20).

However, it is not the only study that reported 'less-than-favorable' results regarding the topic. For example, a study based in Wuhan, China reported a nearly 60% hesitancy rate amongst medical students (23).

Another study with rather familiar results is the one mentioned earlier from Uganda (24).

5.2. Conclusion

In conclusion, this research project has found that the majority of Napata College junior medical students (defined as those who have yet to initiate their clerkships) were not vaccinated. We have also found that a considerable percentage have been previously infected with COVID-19.

If this is an indicator, it is an indicator of a disaster to come especially given the recent high-spreading Omicron variant of the illness. This illustrates the need for immediate, well-thought out interventions with the end-goal of putting an end to the pandemic that has taken the world by storm.

5.3. Recommendations:

- The conduction of introductory lectures on the importance of COVID-19 vaccination
- The immediate implication of safety guidelines regarding COVID-19 (social distancing, hand sanitizing, etc...)
- The conduction of community projects targeting the public and their awareness of COVID-19 and its available vaccines
- The mandating of masks wherever possible
- The introduction of virtual (online) systems of work wherever needed

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