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RESEARCH ARTICLE

The Clinical and Social Economic Profile of Patients Diagnosed with COVID-19 at Likuni Mission Hospital, Malawi.

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ABSTRACT

Background: The COVID-19 pandemic has caused devastating effects on the world since its discovery in the city of Wuhan in 2019. It has claimed millions of lives and has significantly affected the economies of the world. However, the characteristics of affected populations in poorest settings in Africa are not clearly known.
Aims and Objectives: The study was undertaken to evaluate common clinical presentations of patients diagnosed with COVID-19, asses the socio-economic and demographic profiles and analyze the clinical course, and comorbidities of COVID-19 positive patients at Likuni mission hospital, central region of Malawi.
Methods: This was a cross sectional study, however we looked at retrospective data from for all patients diagnosed from January 2021 to January 2022.
Results: Patients were predominantly female (65%), less than 40 years, without any known comorbidity and had at least 3 symptoms before being diagnosed. The most common symptoms were fever, cough, chest pains, headache, shortness of breath, and general body weakness. A significantly higher population were from low social economic status ($p<0.05$). Over 95% of the population suffered minor ailment and did not need hospitalization and advanced life support. All patients that required hospitalization were above the age of 60 and the results were statistically significant ($p<0.05$). More than 90% of the cases were locally spread and did not have traceable positive contact.
Conclusion: The diversity of clinical and epidemiological characteristic of patients diagnosed with COVID-19 across gender, socio-economic status, age group and occupation is extremely important. Our results provides an understanding of the characteristics of patients in a poor setting like Malawi and will inform policy makers at local hospitals and district levels including researchers and the ministry of health.

Background

The COVID-19 pandemic has significantly disrupted

lives across all countries and communities, since its discovery in the city of Wuhan, China, in December 2019[1]. As of 30 December, 2022, the pandemic has approximately affected about 658 million people, and has claimed approximately 6.6 million lives across the globe[2]. The effects of the pandemic across the world can be felt in all areas of the economy, ranging from education, health care, agriculture and trade. Barely 3 months, after the start of the pandemic, Africa recorded its first case of the COVID-19 pandemic in Egypt [3]. Since then, the pandemic spread to all other countries on the continent and has pointedly impacted many lives. Contrary to the earlier projections and estimates, Africa has been one of the continents which have registered the lowest number of confirmed cases and deaths [2].

African health systems have been largely underfunded and face a lot of challenges including slowed universal health coverage (UHC). Every year, lack of access to basic health care, mostly caused by poor funding, contributes to millions of deaths, untold suffering and harrowing health tragedies on the continent [4]. Africa is also one of the continents that are hard hit with infectious diseases including HIV, TB, malaria and there has been a growing burden of non-communicable diseases[5]. The majority of the people on the continent, especially those in low income and middle income, heavily rely on public health services and cannot afford quality private health care[4]. It is in this view that earlier on global estimates were made. Considering the current challenges, that the continent is facing, it was assumed that Africa, would suffer the most devastating effects from the pandemic[1].

Just like many other countries, Malawi was also not spared from the effect of the COVID- 19 pandemic. Malawi reported its first case of the pandemic, on the 2nd of April 2020[6]. As of 30 December 2022, Malawi had reported 88,220 total cases and 2,685 deaths[7]. The dent caused by the pandemic in people's lives and countries' economies is significant. Many people have lost income, and some have lost their jobs as a result of the pandemic[8]. Malawi's health system, just like others in Africa have been largely underfunded, and the budget allocation usually falls below the Abuja recommendation of allocation of15 percent of each country's health budget[9]. Approximately half of the Malawi's population, (50.7%) live below the poverty line and have poor access to health care[10]. There is also a huge pressure on the country's health workforce, as the doctor/nurse to patient, ratio remains high[11].

Like many other countries in Sub-Saharan Africa, so many factors influence access to health care, including cultural beliefs and practices. Many people have limited knowledge about infectious diseases, and easily hold on to traditional and cultural beliefs about the pandemic. In one study, that was done in the early phases of the pandemic in Malawi aimed at assessing knowledge, perceptions and behavior related to the COVID-19 pandemic, it was concluded that almost half of the participants perceived to have no risk or limited risk of contracting the virus pointing to a lot of misconception about the disease[12] This led to laxity in following COVID-19 preventive measures such as masking up, hand washing and social distancing by the general public.

Globally, it is established that patients with comorbidities, such as hypertension and diabetes, and the elderly tend to suffer from the severe disease [13]. A study that was done in Indonesia to find out the comorbidities in cases of death due to COVID-19, revealed that mortality varied with age, with those equal to or above 65 having a 51.4% mortality rate. This paper also clearly illustrated that hypertension, cardiovascular disease, and diabetes were the most common comorbidity in patients' death due to COVID-19 [14,13] A matched 1:2 retrospective case- control study that was done in Malawi, to characterize COVID-19 patients with hypertension comorbidity revealed that deaths due to COVID-19 varied with the hypertensive condition, with more deaths registered in hypertensive patients.

The COVID 19 pandemic has exposed the long-standing structural drivers of health inequities such as growing economic disparities and poor governance. These important determinants of health have been interlinked with social class, ethnicity, gender, education level, and other factors thereby exacerbating the existing social vulnerabilities in society [15]. A proper understanding of the patient's clinical and socio-economic profile is very crucial to the management of the patient with COVID infection and targeting interventions such as timely vaccinations to individuals with highest risk of primary disease, recurrence, incapacitation or death. However, in Malawi, there is a paucity of data on the clinical and social-economic profile of patients diagnosed with COVID-19 hence the need to conduct a study on this. Therefore, the aim of the study was to determine the clinical and socio-economic profile of patients diagnosed with COVID-19 at Likuni hospital serving both urban and semi-urban populations, in the central region of Malawi.

Methods

Study location

The study was conducted at Likuni Mission Hospital in Lilongwe, the capital city of Malawi. The hospital is located in the central region of Malawi. It is affiliated with the Christian Health Association of Malawi (CHAM). This hospital was chosen in consideration of the wide coverage of the people it saves, both urban and peri-urban. It is also one of the institutions in Malawi with proper documentation of patient and clinical data as compared to most government and other private hospitals.

Study design and population

The study was a retrospective cross-sectional survey, of the clinical and social-economic profiles of patients previously diagnosed with COVID-19 at Likuni mission hospital in Lilongwe, Malawi, between January 2021 to January 2022. It involved examination of all records of patients diagnosed with COVID-19 at the mission hospital in the stated period. After clearly examining the records, the clinical presentations, socio-economic data and the covid-19 status were extracted and anonymized with a unique study number to delink it from the patients studied. The retrospective analysis included all patients who tested positive for COVID-19 using DNA PCR as well as rapid test. All patient files that had missing information such as clinical profiles, names and dates of diagnosis were excluded from the study.

Data collection

The Medical records' data was extracted and stored in a password protected computer. The extracted data included the following, demographic characteristics (age, sex, residence location and occupation), clinical presentation and patient comorbidities. The age was categorized into three strata's, (<40, >40-<60, >60) The primary outcomes of the study were hospital admission, and mortality. Occupation and area of residence was used as proxy to estimate the social economic status of the studied patients.

Statistical analysis.

The clinical characteristics of COVID-19 positive patient were stratified into patients with comorbidities and those without comorbidities, and also across various social economic status using two-sided t-test for age, and chi-squared test for categorical variables. Categorical measures were presented as percentages and continuous measures were presented as means and standard deviations. The association between age, comorbidity and hospitalization was assessed using unadjusted and adjusted logistic regression models. Results are presented as percentages.

Results

Characteristics of COVID-19 patients.

There was a total of 496 COVID-19 positive patients who were enrolled. The mean age of the patients included in our final study population was 35 with a mode and median of 24 and 32 respectively. The study population was predominantly female (65%, n= 317). In this study, COVID 19 was also seen more among the group aged less than 40 (67.8%), and predominantly among youth. Table 1; summarizes characteristics of the patients. 108 (22%) cases were among the group aged 40-60 and only 50 (10.2%) affected people aged 60 and above.

Characteristics	**All (n=496)**	**P Value**
Age (Years +SD)	35±(23)	
Age groups (years)		
<40	332	
40-60	108	
>60	50	
Gender		
Male	317 (65%)	
Female	173(35%)	
Economic status (employment and residential area)		
Low economic status	329	0.027
High economic status	160	0.027
Comorbidities		
none	486	0.017
1 to 2	4	0.017
Hospitalization		
Isolated	480	0.258

Admitted	10	0.258
Number of Symptoms		
none	7	0.00
less than 2	171	0.00
more than 2	311	0.00

Table 1. Clinical characteristics and outcomes of patient's diagnosis with COVID-19

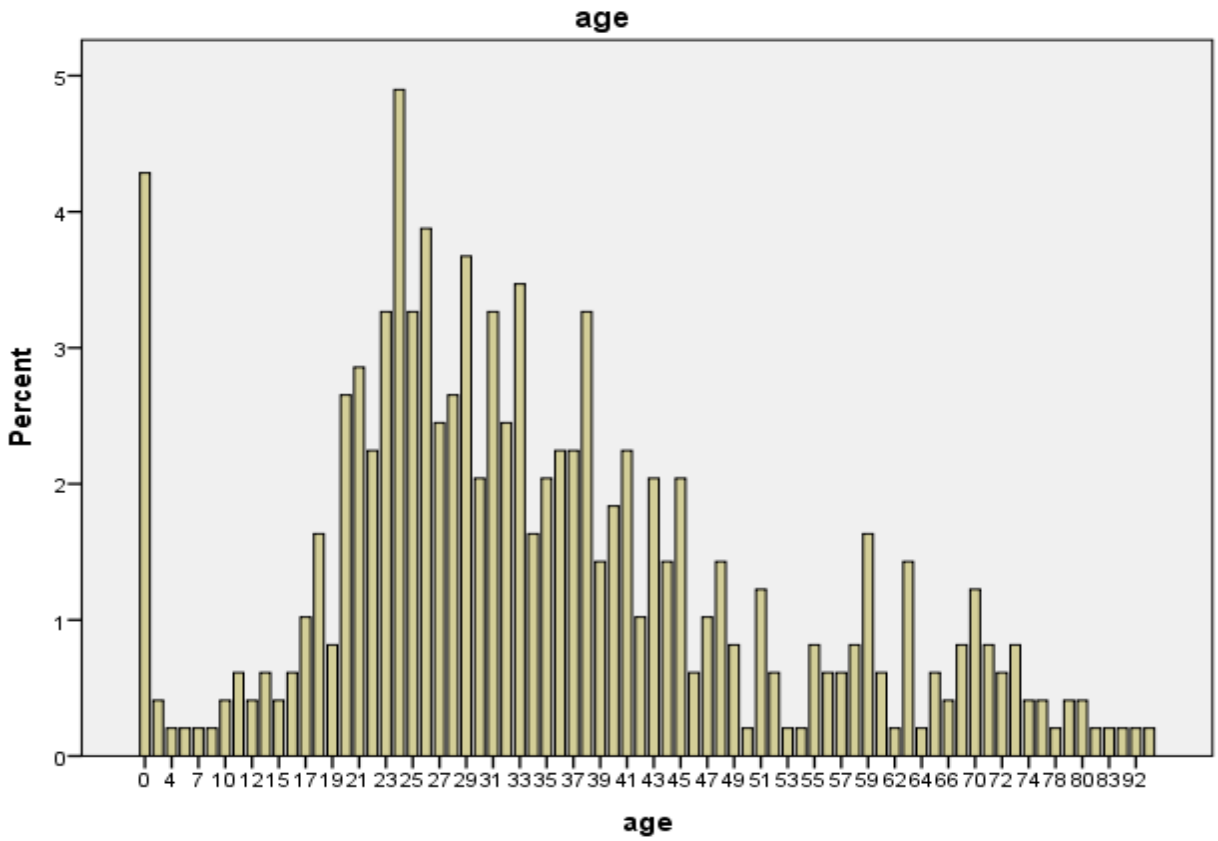

Figure 1: Histogram of COVID-19 patients across various age groups.

Clinical presentation and comorbidity

Most of the patients presented with more than 3 symptoms most of which were fever, cough, chest pains, headache, shortness of breath, and general body weakness. In addition, some patients presented with anosmia, sore throat; vomiting, chills, diarrhoea, loss of appetite, and joint pains. The majority of our patients didn't have any comorbidity indicated in the clinical notes. Only 2 patients had known diagnosis of hypertension and another two were known asthmatic patients.

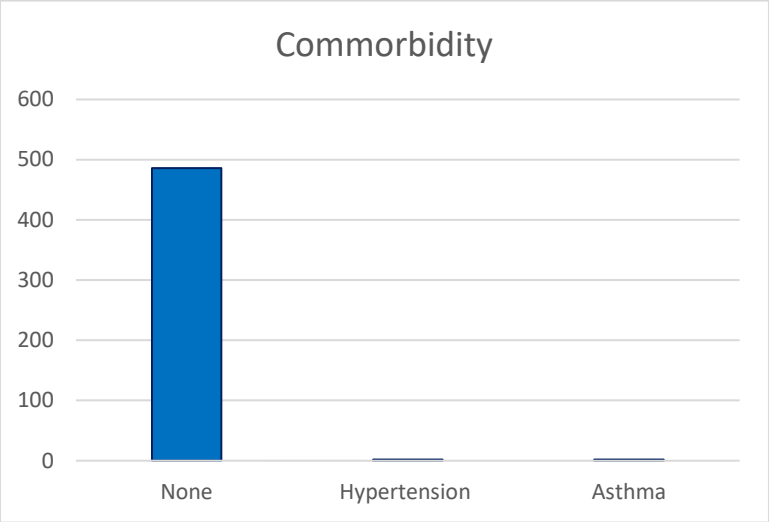

Figure 2. Patient distribution by comorbidity.

Social economic status based on employment status and area of residence

In our study, most of the people that were COVID-19 positive were from low social economic status (329 of 496), representing 67% of the total population. This result was statistically significant (P=0.0258)

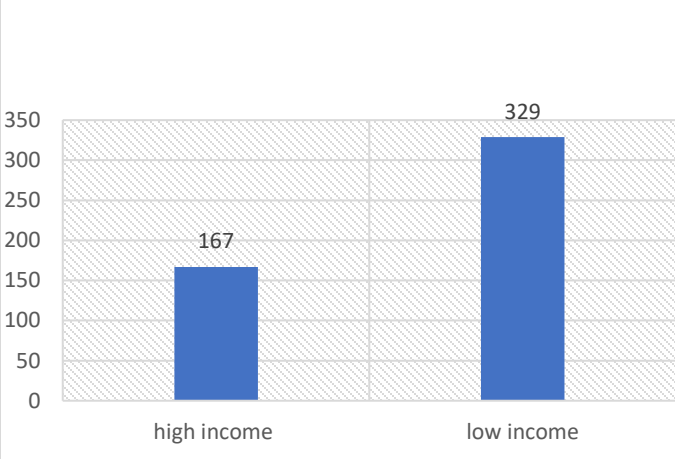

Figure 3: Patient distribution by economic status based on area of residence and occupation

Travel and Contact history

There was no record of recent foreign travel to for all our cases. Only 25 ((5.1%) of 490 patients reported being contact with a patient with a previously confirmed COVID-19. Majority of the patients (87%) did not have any documented positive contact history. They were all reported as index cases.

	Number of patients	percent
Traceable contact	25	5.10%
Index case	471	87%
Travel history	0	0

Table 2: Distribution of patient according to contact and travel history.

Isolation versus Admitted

Majority of our patient required no hospitalization (98%, 480 of 490), while only 2 percent suffered a severe disease and required hospitalization, (10 of 480).

Age versus Admission

There was a close association between advanced age and being admitted at the hospital. Almost all patients that were admitted were about the age of 60 and the results were statistically significant ($p = < 0.001$). All patient that suffered a severe disease survived and were discharged from the hospital.

Discussion

In our retrospective cross-sectional survey of COVID-19 patients at Likuni mission hospital. majority of our patients were females (67%). The typical clinical presentations were fever, cough, chest pains, headache, shortness of breath, and general body weakness. Even though the COVID-19 pandemic had varying clinical picture across various regions, most of the symptoms were similar. The finding from this study, are also reflected in other studies done across the world.[15] The similarity in clinical presentation has a huge significance to public health information, prevention and control of the disease. Whilst the clinical presentation was similar to studies done in other settings, there were huge differences in demographic characteristics such as age. Our population was predominantly younger, with a mean age of 35. This reflects the demographic variations that exist across various nation.

Most of developing countries, including Malawi, have predominantly younger population[16]. Nearly half of the population is below the age of 50, and majority of them are youth[16]. This demographic variation, explains why most of the people affected were in their 20's. This is also the group that has high level of social mobility and interactions, leading to higher rate of positive contacts and increased rate of spread of the disease

While clinical comorbidities such as diabetes, hypertension, dyslipidemias and chronic lung conditions have clearly been documented to affect the outcomes of patients, diagnosed with COVID-19, in this present study, it did not appear as a major factor. Contrary to the findings in studies done across Europe and Asia, where the prevalence of comorbidity amongst patients diagnosed with COVID-19 was as high as 50%[15], our present study demonstrated very low percentage of patients who had comorbidities. Only 2% (n=4) had known diagnosed hypertension and asthma. This may reflect limitations in diagnostic capability across various developing countries. While WHO recommends screening for non-communicable diseases in routine practice, most developing countries lack diagnostic capacity and have inadequate human resource to cater for integrated disease. It is an undisputable fact, that there is an epidemiological transition in Africa. Most countries are suffering from dual burden of NCDs and infectious diseases and Malawi is not an exception.[17] The prevalence of non-communicable diseases has been increasing in Malawi, with hypertensive disorders being the predominant disease[18]

Despite that being the case, many people still live with chronic conditions, but they are largely unaware of it due to poor health seeking behaviour and limited screening for comorbidities during routine care. This could partially explain the low levels of comorbidity among our patients.

There is also a strong link between age and development of chronic conditions. Advanced age has been closely associated with increased risk of developing chronic conditions such as hypertension and atherosclerotic disorders[18]. The predominantly younger population could have led to low levels of comorbidity among our patients as compared to studies done in other regions, which the population is predominantly aged. This demographic variation plays a significant role in the differences in comorbidities seen across the world.

In our study we also observed that most of the patient presented with more than 3 symptoms but did not suffer a severe disease that needed hospitalization. Most of them self-reported to the hospital and were sent to self-isolation as they didn't require advanced respiratory support. Only 10 out of 490 required hospitalizations, and all were above the age of 60. There was a closer association between advanced age and needing hospitalization and the results were statically significant. Unlike in studies done in other settings, nearly all our patients survived and were discharged from the hospital without need of follow up. This is contrary to the findings in other settings, where all-cause mortality was particularly high probably owing to the advanced patient age and high prevalence of comorbid conditions[15]

67% percent of our population lived in suburbs and depended on piece works for day to living. The population was predominantly of low socio-economic status and lived in overcrowded areas. These areas had high COVID-19 transmission rates, but fortunately the case fatality rate was extremely low. Our findings also agree with studies done

across the country, where densely populated areas had high transmission rates and most people barely lived below the poverty level. Also, studies done in other countries, demonstrated that people from low social economic status, were more likely to be affected from the disease[15]. Adherence to COVID-19 preventive measures requires access to safe and clean water, and other preventive equipment such as mask. Most people in low socio-economic status don't have access to these items. This led to challenges in adherence to COVI-19 preventive measures and increased spread of the disease.

Our results clearly demonstrates that various disparities exist among patients diagnosed with COVID-19. The differences in socio-demographic profiles between different regions of the world, has read to different patterns of the disease as it is clearly demonstrated in this study. While most of our patients were young and didn't have any comorbidity, the situation was so different in other parts of the world. This, therefore calls for localized policies and guidelines across various regions to mitigate the spread of the disease.

Conclusion

In urban Malawian hospital, fever, cough, chest pains, headache, shortness of breath, and general body weakness were the most common clinical presentation of the patients diagnosed with COVID-19. Females were more susceptible to the disease as compared to males, and the disease predominantly affect the younger population. Advanced age is a risk factor for severe disease requiring hospitalization. Transmission of the disease is concluded to be more by virtue of local spread as compared to travel to other countries. Majority of the people affected with the disease in the study, recovered without requiring hospital admission or advanced respiratory support. Being of low social economic status, wasn't seen as an independent risk factor for the COVID-19 disease. All cases didn't have recent travel history from another country.

Declarations

Ethics approval and consent to participate

The study was approved by the College of Medicine Research and Ethics Committee (COMREC) before the commencement of data collection (U.06/22/3660). Permission to conduct the study was provided by the Admistrator of Likuni mission hospital. The study didn't involve direct contact with the patients, so there was no need to get informed consent from the patients. However, data was handled in accordance with the principles of confidentiality. All the records were de-identified and stored on a password-protected computer. Hard-copy records were stored in a locked filing cabinet.

Consent for publication

Written consent for the study participation and potential publication of results was sought from Likuni hospital before commencement of data collection.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors have no comflicts of interest to declare.

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Author Contribution

AFL: Concept and design of the study, prepared first draft of the Manuscript, Interpreted result and literature review. AL: Data analysis, Literature review. DN: Data collection, GKK: Data Collection, VM: project supervision, GMP, LMN and EM: Provided factual-check from Christian Health Association of Malawi. TN: Concept suggestion, project supervision and final manuscript editing

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