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The Impact of the Covid-19 Pandemic on the Management of Non-Communicable Diseases in Kenya: Challenges and Opportunities for Health Systems

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Abstract

COVID-19 pandemic had a significant impact on healthcare systems worldwide, including the management of Non-Communicable Diseases (NCDs). This paper examines the effect of COVID-19 on the management of NCDs in Nyeri, Isiolo, Machakos and Kisumu counties in Kenya. The specific objectives were to establish the management of NCDs and identify changes and frequency in sensitization on NCDs during and before COVID-19 pandemic. A mixed-methods approach was used to collect data, comprising both quantitative and qualitative methods. Quantitative data were collected through a retrospective analysis of NCDs management data from January 2019 to June 2021, while qualitative data were collected through in-depth interviews with healthcare workers and patients. Purposive sampling was used to select Key Informants while random sampling was used to samples the patients. In total a sample size of 328 respondents were sampled. Wilcoxon Signed Ranks Test was used to compare patient perceptions of hospital services in the management of non-communicable diseases during COVID-19 and before COVID-19 and result indicated Z-Score of -3.925. In addition, 44.1% stated that there were changes in frequency of community sensitization on NDCs, while 35.3% stated no changes and 20.6 % of respondents were not sure if there were changes in frequency of community sensitization on NDCs during COVID-19 compared to pre COVID-19 period. This indicated that patient perceptions were significantly worse during COVID-19 compared to before COVID-19. The COVID-19 pandemic had a negative impact on the management of NCDs in Kenya. The number of patients seeking treatment for NCDs declined due to fear of contracting COVID-19 in healthcare facilities. Overall, the study highlights the need for urgent action to mitigate the impact of COVID-19 and other related illness on the management of NCDs in Kenya in future. This includes developing innovative strategies to increase access to NCDs services while minimizing the risk of COVID-19 transmission and other related illness. The strategies include observing personal/community hygiene, strengthening health systems to ensure the availability of essential medicines and supplies, and providing adequate support and resources to healthcare workers during times of outbreak..

Keywords: ***COVID-19, NCDs, healthcare, universal health care***

Introduction

In recent history, the world has witnessed the unprecedented emergence of the COVID-19 pandemic, a global crisis that has reshaped societies, economies, and healthcare systems. Beyond its direct impact on the respiratory health of individuals, COVID-19 has revealed a multitude of interconnected challenges that extend far beyond viral transmission (Raimi et al., 2021). Among these challenges lies the profound effect the pandemic has had on the management of non-communicable diseases (NCDs) – a class of diseases responsible for the majority of global mortality, often referred to as the "silent pandemic" itself (Williams, 2018).

The interconnectedness of health crises has been increasingly acknowledged in the literature. The COVID-19 pandemic has highlighted the vulnerabilities of healthcare systems worldwide and underscored the need for adaptable and resilient health infrastructures. Studies have highlighted the strain on healthcare resources as attention shifted towards pandemic response, leading to disruptions in the provision of routine care for chronic conditions like NCDs (Deepthi et al., 2020). This redirection of resources has been witnessed globally, spanning from developed nations to resource-constrained regions such as sub-Saharan Africa.

Within the realm of NCD management, prior research underscores the escalating global burden of diseases such as cardiovascular diseases, diabetes, and cancer. These conditions account for an increasing proportion of deaths globally, with projections indicating that the burden will continue to rise (IHME, 2020). This trend is particularly pronounced in regions like sub-Saharan Africa, where the epidemiological transition is occurring amidst existing health challenges (Nyirenda, 2016). The pandemic's outbreak further exacerbated this transition, triggering disruptions that have affected the continuum of NCD care. As the COVID-19 virus swiftly traversed international borders, healthcare systems around the world scrambled to realign their priorities to address the acute demands of the pandemic. Amidst this upheaval, another critical health crisis loomed—the management of NCDs. Across continents, health facilities found themselves navigating the dual challenge of maintaining continuity in NCD care while curbing the spread of the novel coronavirus. The scenario was no different in sub-Saharan Africa, a region grappling with the intersection of NCDs and infectious diseases within resource-constrained environments (WHO, 2020).

In Africa, the burden of NCDs has been steadily rising, fueled by shifts in lifestyle, urbanization, and aging populations. While communicable diseases have traditionally commanded significant attention and resources, the emergence of NCDs as a formidable health concern has necessitated a recalibration of healthcare systems (Nyirenda, 2016). Against this backdrop, the COVID-19 pandemic struck, introducing a new layer of complexity. The African continent faced the challenge of reconciling the immediate crisis of COVID-19 with the ongoing need for effective NCD management, a struggle magnified by limited healthcare infrastructure and access barriers (Bwire et al., 2022). Kenya, like many countries in sub-Saharan Africa, grapples with a dual health burden—a legacy of communicable diseases juxtaposed with a rising tide of NCDs (Onyango & Onyango, 2018). The COVID-19 pandemic further illuminated the fragility of healthcare systems, uncovering vulnerabilities that had been long festering (Brand et al., 2020). As the pandemic gripped the nation, fears of contracting COVID-19 in healthcare settings led to a drastic decline in patient visits for NCD care. Routine check-ups, medical consultations, and essential diagnostic tests bore the brunt of this decline, revealing a glaring discontinuity in disease management.

As the global community continues to grapple with the long-lasting effects of the COVID-19 pandemic, it becomes imperative to comprehensively examine the repercussions on the management of NCDs, especially within the distinct context of Kenya. The crucial interplay between global, regional, and local dynamics presents a multifaceted challenge—one that extends beyond healthcare facilities to encompass health policies, infrastructure, and resource allocation. This paper seeks to shed light on the adverse effects of the COVID-19 pandemic on NCD management in Kenya, elucidating the intricate web of factors that have hindered the continuity of care for individuals with NCDs. Through a mixed-methods approach, the study delves into the quantitative and qualitative aspects of this issue, ultimately aiming to inform strategies that mitigate the impact of the pandemic on NCD management and reinforce the resilience of Kenya's health systems in the face of such dual health threats.

In a Kenya where payments for health services are mostly out of pocket results to the impoverishment of many households due to the declining in household incomes greatly affecting access to health services. During the COVID-19 restrictions period it was noted that the management of NCDs was affected due the spread of the virus. It's from this background that the study sought to ascertain the level of management during the said period compared to before COVID-19.

The main goal of the paper was to examine the effect of COVID-19 on the management of NCDs in Nyeri, Isiolo, Machakos and Kisumu Counties in Kenya.

The specific objectives were to;

i. Establish the management of NCDs in Nyeri, Isiolo, Machakos and Kisumu counties in Kenya
ii. Identify changes and frequency in sensitization on NCDs during COVID 19 pandemic in Nyeri, Isiolo, Machakos and Kisumu counties in Kenya.

Materials and Methods

The study employed a comparative approach to assess the impact of the emergence of COVID-19 on the attainment of management of non-communicable diseases within the framework of Universal Health Coverage (UHC). To this end, the research adopted an innovative Interrupted Time Series (ITS) design, which entails the examination of multiple measures within a single group across uniform time intervals, with an interruption introduced by the implementation of the intervention (Lau & Kuziemsky, 2017). Data collection for the study spans two distinct periods: the pre-COVID-19 era (16th March 2019 to 15th March 2020) and the post-COVID-19 period (16th March 2020 to 15th March 2021).

The study's methodological foundation encompasses two data collection methods, designed to provide comprehensive insights into the accessibility and affordability of reproductive health services. Firstly, the research conducted semi-structured interviews with a targeted selection of patients who frequently seek management of non-communicable diseases, engaging with them during their clinic visits. Secondly, the study procured annual health records from health record and information officers stationed in nine hospitals that fall within the study's scope. The dataset garnered through this approach encompasses annual statistics concerning consultations, availability of medicines and the quality of services rendered.

The geographical focus of this research encompassed four counties in Kenya: Nyeri, Kisumu, Machakos, and Isiolo. These counties serve as the setting for piloting the UHC program, making them particularly relevant for exploring the impacts of the pandemic within the context of evolving healthcare systems. Nyeri County, located in the central region of Kenya, occupies an area of 2361 square kilometers and is home to a population of 759,164 people. Kisumu County, situated in the western part of the country, encompasses an area of 2085.9 square kilometers and has a population of 1,155,574. The health challenges facing Kisumu County are significant, marked by high infant and under-five mortality rates, maternal mortality concerns, and persistent issues with malaria transmission. Machakos County, in the Eastern region, has a population of 1,421,932 and covers an expansive area of 6208.2 square kilometers, predominantly characterized by semi-arid conditions. Lastly, Isiolo County, situated in the former Eastern Province, spans an extensive area of 25,336.7 square kilometers and sustains a population of 268,002. Notably, Isiolo County contends with diverse developmental challenges and shares borders with seven neighboring counties.

Innovatively combining the ITS design with qualitative and quantitative methodologies endeavored to unveil a comprehensive perspective on the transformation of the management of non-communicable diseases under the influence of the COVID-19 pandemic within the distinctive backdrop of UHC implementation in these four Kenyan counties.

Results

For the objective to be achieved, patients seeking health services, key health workers and record officers in the sampled hospitals were interviewed. The sampled patients were asked on management of non-communicable diseases during the COVID-19 pandemic. Approximately a half of the patients responded to have changes in management of NDCs during the COVID-19 time while the remaining half of the population responded to have no changes in management of NDCs during COVID-19 pandemic. Patients were also asked about any changes in the frequency of community sensitization on NDCs during COVID-19 compared to pre COVID-19 period. Majority of the respondents (44.1%) stated that there were changes in frequency of community sensitization on NDCs, about 35.3% stated no changes and 20.6 % of respondent were not sure if there was changes in frequency of community sensitization on NDCs during COVID-19 compared to pre COVID-19 period.

Table 1

Changes in Management of NCDs services

		Frequency	Valid Percent
Changes in management of NDCs compared to pre COVID-19 period	Yes	36	50
	No	36	50
Changes in the frequency of community sensitization on NDCs	Yes	30	44.1
	No	24	35.3
	Not sure	14	20.6

Table 2

Changes in Management of NDCs Compared to Pre COVID-19 Period

Changes in Management of NDCs Compared to Pre COVID-19 Period	Valid Percent
Abscond of services	3
Better management	3
COVID-19 fear	3
Increased number of patients	6
Interruption of checkups	3
Lack of transport	3

Shortage in drug supply	28
Longer service time	14
More COVID-19 awareness	6
No good timing	3
No support groups	3
Poor service delivery	14
Unavailable tests	3

Specific Changes in NCDs Management Services

The patients were asked on the specific changes they faced in management of NDCs during COVID-19 compared to pre COVID-19 period. Most patients (28%) reported a shortage in drugs and supply. It was also observed that 28% of patients reported to have longer service time and poor service delivery during COVID-19 period. About 6% of respondents stated there was an increased number of patients and also more COVID-19 awareness. About 3% of respondents stated that some services had ceased to be offered. Similarly, some respondent gave some negative feedback such as COVID-19 fear, interruption of checkups, lack of transport, no good timing, lack of support groups and unavailable tests during COVID-19 period compared pre COVID-19 period. Only 3% of the patients felt that the services had improved.

Table 3

Changes in Sensitization on NCDs

Changes in the Frequency of Community Sensitization on NDCs	Valid Percent
COVID-19 restrictions	11
more COVID-19 sensitization	29
More sensitization	14
Never present	4
No support groups	7
Reduced sensitization	36

The respondents were also asked on the specific changes in the frequency of community sensitization on NDCs during COVID-19 compared to pre COVID-19 period. Majority respondents (36%) reported reduction in sensitization. It was also noted that 29% of respondents stated more sensitization of COVID-19 compared to NDCs sensitization. About 14% of respondent stated that there was increased in sensitization of NDCs. Approximately, 7% of respondent reported lack of support groups and finally, fewer respondent (4%) reported to lack of changes in frequency of community sensitization of NDCs during COVID-19 period.

Table 4

Changes in NCDs Management (HCWs)

		Frequency	Valid Percent
Changes in management of NCD	No	17	53.1
	Yes	15	46.9
Ability to screen NCD during COVID-19	Capable	1	4.5
	Yes	21	95.5
Changes in sensitization	No	5	16.1
	Yes	26	83.9

The key informant's health workers were asked whether there existed changes in management of NCD during COVID-19 period. 46.9% of workers reported change in management while 53.1% reported no difference in management whether during COVID-19 period or pre COVID-19 period. The results also showed majority of workers (95.5%) agreed had ability to screen NCD during COVID-19 with only 4.5% workers capable. Most workers (83.9%) also noted changes in sensitization of NCD with only 16.1% reporting no changes in sensitization during COVID-19 period.

Figure 1

Comparison of NCD Management Services before and During COVID 19

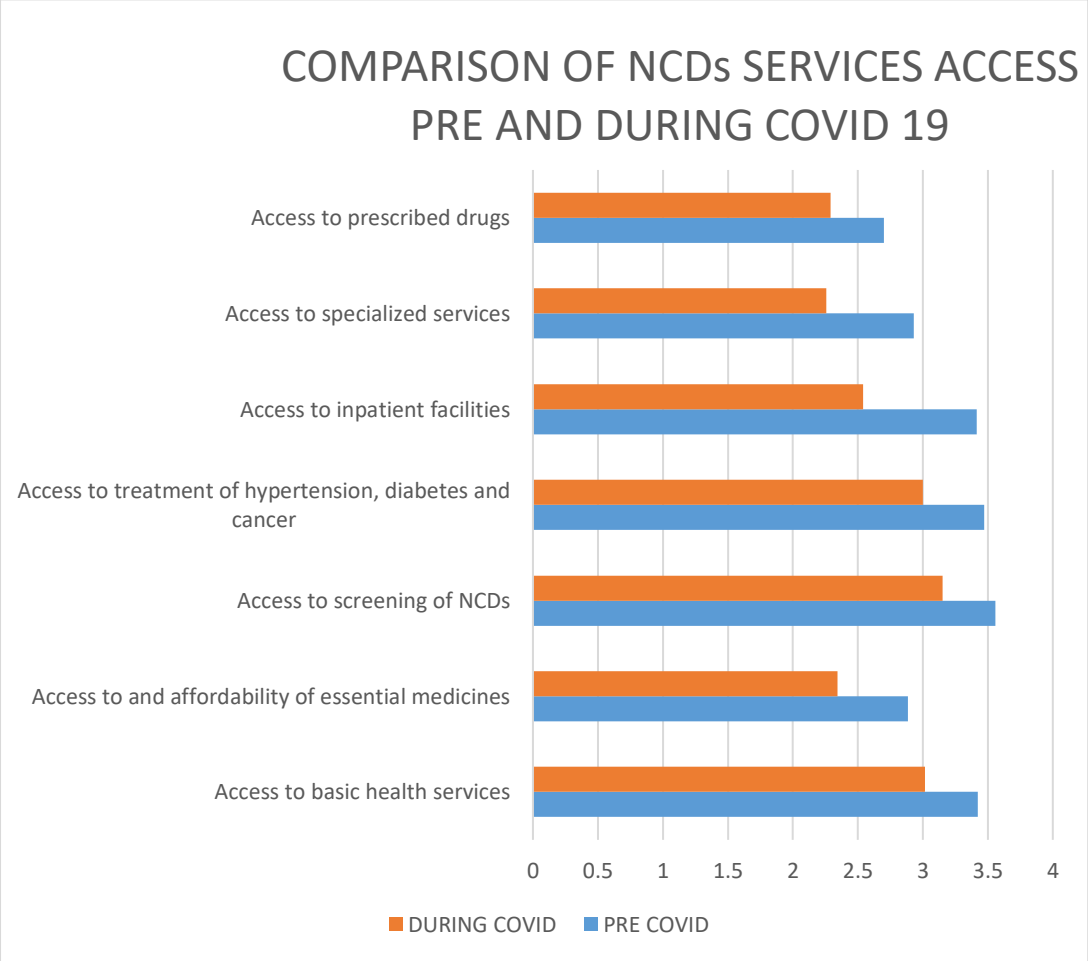

Figure 1 showed NCDs services during pre COVID-19 period and access of the same services during COVID-19 period. Patients were asked the ease of accessing the NCDs services with 1

being very difficult and 5 being very easy. The bar graphs shown in the figure indicate the ratings given by the respondents. Generally, the bar graphs showed that access of NCDs services was easier during pre COVID-19 period compared to COVID-19 period.

Table 5

Summary of service rating on management of NCDs

Descriptive Statistics	N	Mean	Std. Deviation	Minimum	Maximum
Pre- COVID-19	60	3.2028	0.77916	1	5
During COVID-19	62	2.7228	0.82636	1	5

Before COVID-19, the mean rating was 3.2028, which indicates a relatively positive overall satisfaction level. During COVID-19, the mean rating decreased to 2.7228, suggesting a slight decrease in satisfaction during the pandemic. Before COVID-19, the standard deviation was 0.77916, while during COVID-19, it increased slightly to 0.82636. This implies that during the pandemic, there was a bit more variability in patient ratings compared to the pre-pandemic period.

Table 6

Summary of Ranks (Wilcoxon Signed Rank Test)

Ranks		**N**	**Mean Rank**	**Sum of Ranks**
During COVID-19 - Pre- COVID-19	Negative Ranks	31 a	21.65	671
	Positive Ranks	8b	13.63	109
	Ties	21 c		
	Total	60		

a During COVID-19 < Pre- COVID-19
b During COVID-19 > Pre- COVID-19
c During COVID-19 = Pre- COVID-19

There were 31 observations where patients ranked the services lower during COVID-19 compared to before COVID-19. The mean rank for these negative ranks is 21.65. This means, on average, these ranks are around the middle of all ranks. The sum of ranks for these negative ranks is 671.00. There were 8 observations where patients ranked the services higher during COVID-19 compared to before COVID-19. The mean rank for these positive ranks is 13.63. This means, on average, these ranks are relatively lower compared to the mean rank of negative ranks. The sum of ranks for these positive ranks is 109.00. Twenty-one patients ranked the services similarly during COVID-19 and before COVID-19.

These ranks suggested that, on average, patients ranked the services higher before COVID-19 compared to during COVID-19. The negative ranks have a higher mean rank, indicating that there were more instances where patients ranked the services lower during the pandemic. Conversely, the positive ranks indicated that a smaller number of patients ranked the services higher during the pandemic.

Table 7

Paired test for the mean Difference

Test Statisticsa	
	During COVID-19 - pre-COVID-19
Z	-3.925b
Asymp. Sig. (2-tailed)	0

a Wilcoxon Signed Ranks Test

b Based on positive ranks.

The Wilcoxon Signed Ranks Test was used to compare patient perceptions of hospital services in the management of non-communicable diseases during COVID-19 and before COVID-19. The Z-Score is -3.925. This indicates how many standard deviations the test statistic (the sum of positive ranks) deviated from the expected value under the null hypothesis. In this case, the negative Z-Score suggests that the sum of positive ranks is significantly lower than expected. The p-value equal to zero ($p<0.05$), this p-value indicated strong evidence against the null hypothesis. Since the p-value is very small, much smaller than a typical significance level like 0.05, it suggested that there was a strong statistical evidence to reject the null hypothesis. In this context, the null hypothesis was rejected and there was no difference in patient perceptions of hospital services during COVID-19 compared to before COVID-19. The negative Z-Score and the very low p-value together suggest that patient perceptions were significantly worse during COVID-19 compared to before COVID-19.

Results

The study reveals compelling evidence that the COVID-19 pandemic has brought about substantial implications for the management of non-communicable diseases (NCDs). The decrease in patient satisfaction ratings during the pandemic, as well as the results of the Wilcoxon Signed Ranks Test, affirm the significant negative impact on NCD management. These findings align with those of Traiki et.al. (2020), who reported the substantial impact of the COVID-19 pandemic on healthcare systems across both developing and developed countries. In a similar vein, this study's results of a decrease in patient satisfaction ratings during the pandemic, underscores the significant negative implications for the management of non-communicable diseases (NCDs).

The profound concern of a 28% subset of respondents over the shortage in drug supply underscores a challenge that echoed globally during the pandemic. This issue is corroborated by numerous studies that reveal disruptions in the pharmaceutical supply chain due to lockdowns, transportation restrictions, and a surge in demand for medical resources. Such shortages of vital medications can expose patients with chronic NCDs to severe health risks and complications. Interestingly, 6% of respondents highlighted heightened COVID-19 awareness. This can be seen as a positive outcome, indicating that patients were engaging in infection prevention measures. However, it also reflects the intricate balance healthcare systems must maintain between NCD management and the broader concerns related to the pandemic. Comparing and contrasting these findings with the research by Badreldin and Atallah (2021), similar findings can be drawn in the challenges faced across different contexts. Both studies acknowledge the disruptions in drug supply chains as a common hurdle, thereby amplifying the urgency of addressing this issue at a systemic level. Additionally, the heightened COVID-19 awareness observed in our study corresponds with the increased awareness

emphasized by Badreldin and Atallah (2021), highlighting the impact of a health crisis on public consciousness.

Additional challenges, such as COVID-19 fear, interrupted checkups, transportation difficulties, unfavorable appointment timings, and unavailable tests, were identified by smaller subsets of respondents. While these challenges contribute to decreased patient satisfaction and negatively impact NCD management, a comprehensive understanding of their nuanced implications necessitates further exploration. The findings from the study by Morganstein et al. (2017) in "Pandemics: Health Care Emergencies" provide valuable insights that can be linked to the additional challenges identified in our study. Morganstein et al.'s work emphasizes the broader implications of such challenges on the healthcare system and patient well-being, while this study's findings specifically highlight how these challenges affect NCD management and patient satisfaction.

Comparing these findings to other studies underscores the overarching narrative of the pandemic's profound impact on healthcare services worldwide. A growing body of research underscores that healthcare systems faced upheaval in delivering both routine and specialized care, directly influencing patient outcomes. These challenges emerged from the need to redistribute resources, enforce infection control measures, and adapt to shifts in patient behavior and preferences.

Conclusion

In conclusion, the data analysis emphatically underscores the significant implications of the COVID-19 pandemic on non-communicable disease management. The challenges reported by respondents, paired with the statistical evidence, underscore the urgency for healthcare systems to strategize solutions to address disruptions caused by the pandemic and to ensure the continued effectiveness of NCD management.

Recommendation

The study recommended a broader global landscape, healthcare policymakers and practitioners can glean insights that enhance their ability to anticipate and navigate future crises, thereby bolstering the resilience of healthcare systems.

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