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Factors Associated with Healthcare Utilization Among Adults in Saudi Arabia During the COVID-19 Pandemic

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Data Availability Statement included at the end of the article

Abstract

To investigate factors associated with healthcare utilization by adults in the Kingdom of Saudi Arabia (KSA) during the COVID-19 pandemic. Based on Andersen's Behavioral Model of Health Services utilization, we conducted logistic regressions to determine the relationship between predisposing factors (age, gender, education, employment status), need factors (critical medical needs), and enabling factors (insurance coverage, financial loss) on healthcare utilization (challenges accessing medical health care needs, resorting to alternative care, unable to attend medical appointments) as the main outcome. Data of 958 adults residing in KSA were extracted. Financial loss increased the odds of challenges in accessing healthcare (OR: 1.73) and lowered the odds of resorting to alternative medical care (OR: 0.63) and inability to attend healthcare appointments (OR: 0.55). Public insurance increased the odds of skipping healthcare appointments (OR: 1.62). Need factors were associated with lower odds of facing challenges accessing healthcare (OR: 0.37), higher odds of resorting to alternative medical care (OR: 5.65), and failure to attend healthcare appointments (OR: 1.92) respectively. Factors known to enable healthcare utilization should be continuously evaluated during emergency situations. Alternative routes of health provision, along with proper health education, should be accessible to all socioeconomic groups.

Plain language summary

Purpose: This study investigated factors associated with healthcare utilization by adults in Saudi Arabia during the COVID-19 pandemic. Methods: An online self-administered questionnaire was distributed during the first wave of COVID-19 outbreak to adults aged 18 years and above residing in Saudi Arabia. The questionnaire gathered data about healthcare utilization (challenges accessing medical health care needs, resorting to alternative care, unable to attend medical appointments) participants' demographics (age, gender, education, employment status), critical medical needs and enabling factors (insurance coverage, financial loss). Conclusions: From the 958 adults residing in Saudi Arabia, we found that those with financial loss had challenges accessing healthcare and were less likely to resort to alternate medical care. While those with public insurance were more likely to skip healthcare appointments. Those with medical needs were less likely to face challenges accessing healthcare but were more likely to resort to alternative medical care and more likely to skip healthcare appointments. Implications: The study highlights factors known to enable healthcare utilization that should be continuously evaluated during emergency situations. The study also highlights the need for alternative routes of health provision, along with proper health education. The results of the study may help policy makers during outbreaks to prioritize disadvantaged populations and those with medical needs. Limitations: This was self-reported data which may be subjected to recall bias. We did not assess factors such health-seeking behaviors of participants before COVID-19 as well as participants' nationality. Expatriates working in the private sector are deprived of the free public healthcare services and financial support available to Saudi nationals, which could have altered the current findings.

Keywords

COVID-19, financial loss, healthcare utilization, healthcare avoidance, health seeking behavior, medical insurance

Introduction

The novel coronavirus pandemic (COVID–19) has affected various sectors of the global economy (Nicola et al., 2020), education (Marinoni et al., 2020), healthcare (Kaye et al., 2021), and health (Velavan & Meyer, 2020). Mental health (Torales et al., 2020), social wellness (Marinoni et al., 2020; J. Singh & Singh, 2020), and the overall wellbeing of communities have also been impacted (Bhagra et al., 2020). The impact of the pandemic on healthcare systems has been astronomical where healthcare systems have suffered from shortage of materials and equipment, healthcare providers, patient census overload (Hassanian-Moghaddam et al., 2020), and financial challenges, as the pandemic persists (Marinoni et al., 2020; Velavan & Meyer, 2020). The degree to which COVID-19 has negatively impacted different sectors of a country varied by the country's economic robustness, ability to respond rapidly, support measures, and resilience to the new norms imposed by the pandemic (Carrasquillo, 2013; Marinoni et al., 2020; Sarkodie & Owusu, 2020).

One major area that has impacted on healthcare systems is the decline in utilization of healthcare services for preventive, curative, and routine care (Becker et al., 2021; Moynihan et al., 2021; Richards et al., 2020). This is due to multiple reasons that stem from adherence to the restriction of movement as part of lockdown policies

(Becker et al., 2021; Richards et al., 2020; Ziedan et al., 2020), cancellation of elective procedures (Becker et al., 2021), fear of contracting COVID-19 infection in hospital settings (Lazzerini et al., 2020), and increased costs of healthcare services (Anderson et al., 2021; Becker et al., 2021; Moynihan et al., 2021).

Saudi Arabia responded swiftly to the COVID-19 pandemic (Algaissi et al., 2020). The government applied various protocols to contain the spread of infection ranging from nationwide lockdown, quarantine, travel bans, and remote working to individual directives like social distancing, mandatory wearing of face masks, and postponement of elective medical procedures (Algaissi et al., 2020; Communication Government Center-KSA, 2020). Similar measures negatively affected healthcare utilization during the pandemic in high-income (Michalowsky et al., 2021) and low-income (Roy et al., 2021) countries, but the specific impact on healthcare utilization in Saudi Arabia is unknown. Reduced or delayed healthcare utilization during the pandemic can have detrimental long-term health consequences (Mehrotra et al., 2020; Richards et al., 2020; Roy et al., 2021). Patients may suffer from delayed routine care and miss the window of opportunity for early diagnosis, potentially leading to increased morbidity and mortality rates; as well as a negative impact on the overall well-being of the population (Tsai & Yang, 2020). A thorough understanding of the patterns of healthcare utilization during the pandemic is crucial for informing clinical decision-making and public health policy makers. This information could enable governments to identify and implement effective strategies to ensure standard care procedures and for predicting any adverse outcomes in similar outbreak scenarios.

It was hypothesized that hospital service utilization in Saudi Arabia may not be significantly affected by individual-level, finance-related factors during the pandemic as the country has a well-established healthcare system ranked 26th (out of 191 countries) by the World Health Organization (WHO, 2000). The public healthcare system provides free healthcare for both Saudis and non-Saudis working in the public sectors (Al-Hanawi et al., 2020) and to all residents in Saudi Arabia during emergencies (Al-Hanawi et al., 2020; Alsharqui, 2006). The public healthcare system is financed by the government through oil revenues, while private healthcare is financed through a combination of employee insurance and out-of-pocket payments by the employer and consumer (Al-Hanawi et al., 2020; Alsharqui, 2006; Rahman, 2020). Thus, provision of free healthcare should have continued under pandemic conditions, mitigating the potential for reduced access to care that may have resulted from the financial loss experienced during the COVID-19 outbreak (K. Singh et al., 2021).

This hypothesis is grounded on Andersen's (1995) behavioral model of healthcare utilization. The model notes firstly that the social class, demographic factors, and personal beliefs of the benefits of health services predisposes individuals to seek healthcare. Secondly, resources in the family and community enable access to healthcare. Thirdly, the extent to which individuals believe there is a need for health services will affect the utilization of healthcare services. Andersen's Behavioral Model has been used extensively as a theoretical framework by studies investigating the use of health services for different disease management with some but not all studies showing an association between several predisposing and explanatory factors, and the utilization of healthcare, with a lack of consistency in the findings (Babitsch et al., 2012; Von Lengerke et al., 2013). The theory enables the construction of multilevel models of possible health service utilization predictors and enablers. We anticipate that the pandemic could not have significantly changed the social class, demographic factors, and personal beliefs factors affecting access to healthcare services in Saudi Arabia. Therefore, this study aimed to investigate the utilization of healthcare services by adults in Saud Arabia and identify the predisposing and enabling factors associated with access to healthcare during the COVID-19 pandemic.

Methods

Study Design and Setting

This was a cross-sectional, survey-based study conducted during the period from June to December 2020.

Study Participants and Sampling

Data from a subset of adults residing in Saudi Arabia was extracted from the main study sample. The study utilized global non-probability (convenience) sampling strategies to recruit adults aged 18 years and above who responded to an online, self-administered survey. Details of the recruitment strategy have been reported in prior publications (Folayan et al., 2021, 2022; Nguyen et al., 2020). There were no exclusion criteria, however, those who did not give consent electronically were automatically exited from the survey.

Data Collection Instrument and Procedure

The main study from which the current data was derived aimed to assess adults' mental health during the COVID-19 pandemic. This was a global study that has 45 collaborators around the world. Data was collected from 152 nations (including Saudi Arabia). Given the restrictions

of movement and social distancing imposed during the pandemics across the globe, the survey was conducted online. The global survey tool had sections that collected information on the demographics of respondents, their history of COVID-19 infection as well as their medical history, and the impact of COVID-19 on their daily life and practices. The survey tool was initially developed to determine the impact of COVID-19 on the mental health and wellness of adults in the United States (Nguyen et al., 2020) and was consequently validated and adapted for use by a global audience (El Tantawi et al., 2022). The overall content validity index for the survey questionnaire was 0.83.

Collaborators shared the survey link with their personal connections who in turn shared it with their networks over social media such as Facebook, Twitter, Instagram, and WhatsApp in addition to email. Survey collaborators distributed the survey links in their countries to guarantee maximum representation and geographic spread. Data was collected anonymously. The survey instrument was administered in English and Arabic for respondents in Saudi Arabia through the survey platform. Each participant was able to answer the survey once and to edit their answers freely until they chose to submit. Detailed methodology and preliminary information of the study design and implementation had been described in previous publications (El Tantawi et al., 2022; Folayan et al., 2021, 2022; Nguyen et al., 2021). For the current study, the sections of the questionnaire relevant to the research questions and responses from residents of Saudi Arabia during the first wave of the pandemic, were extracted ($N = 958$).

Dependent Variables

The principal outcome variable was healthcare utilization assessed through three measures. Participants were asked if they faced any of the following during the COVID-19 outbreak: (1) challenges accessing medical care, (2) resorting to alternative medical care, and (3) inability to attend health care provider appointments. Answers were self-reported by the participants as yes, no, or not applicable. Later, dummy variables were created by removing the data for those who responded, "not applicable." The content validity index for this section of the survey questionnaire was 0.90.

Predisposing Factors

Based on Andersen's (1995) model of healthcare utilization, socio-demographic factors including (1) age: calculate from year of birth, (2) sex at birth: male or female, (3) educational level: "primary education," "secondary education," "university education," or "postgraduate," (4) current relationship: living with or without a partner, and (5) current work status: employed, unemployed, retired, or student were investigated.

Need Factors

Participants responded either "yes" or "no" when asked if they had any critical medical needs.

Enabling Factors

These were factors that may facilitate access to healthcare based on Andersen's (1995) model of healthcare utilization. Participants were asked if they: (1) have health, public, private no health insurance; and (2) faced any financial loss due to the pandemic.

Ethical Considerations

The survey was preceded by an introduction about the study team, study objectives, and time required to complete the questionnaire. This was followed by a consent form assuring participants of the confidentiality of their responses and emphasizing that their participation was voluntary and anonymous. Only participants who consented could proceed to the survey. Personal data were not collected to secure the anonymity of the responses. The ethical approval was obtained before commencing the study.

Statistical Analysis

The analyses proceeded in two phases. The descriptive phase explored the frequency distributions of the outcome and the independent variables. The analytic phase investigated the association of independent variables with each of the three measures of healthcare service utilization using multivariable logistic regression analyses. While creating the dummy variables, the proportion of respondents that reported "not applicable" for the variables namely, challenges accessing medical care, resorting to alternative medical care, and inability to attend health care provider appointments, were 2%, 2.4%, and 6.2%, respectively. The estimated rate of missing data for the variables for the overall dataset were 31.7%, 31.8%, and 41%, respectively. These missing values from the data were classified as missing completely at random and were therefore removed during the logistic regression analyses (Kang, 2013). The fit of each model in the logistic regression analyses obtained by applying the Pearson's Goodness of Fit test was <0.50. Data entry and analyses were carried out using the IBM-SPSS version 24. The level of statistical significance was set at 0.05.

Results

Table 1 presents the descriptive data of the study variables. The overall sample size was 958 with a mean age of 33.13 (SD = 11.08) years, of which 530 (55.3%) were males, 596 (62.2%) had university education, and 510 (53.2%) were employed. Slightly more than half (53.1%) of the study population reported to be living with their partners. Also, 88 (9.2%) had critical care needs during the pandemic, 469 (71.7%) had challenges accessing medical care during the pandemic, 331 (34.6%) experienced financial loss during the pandemic, 457 (47.6%) did not have health insurance, 160 (19.2%) reported resorting to alternative medical care, and 176 (18.4%) were unable to attend medical appointments.

Table 2 presents findings from the logistic regression analysis assessing the association between the dependent variables and predisposing, need, and enabling factors. Respondents who reported financial loss had significantly higher odds of experiencing challenges in accessing medical care (OR: 1.73; 95% CI [1.19, 2.50]). They also had significantly lower odds of resorting to alternative medical care (OR: 0.63; 95% CI [0.43, 0.93]) compared with those who did not experience a financial loss or had significantly lower odds of reporting difficulty attending a scheduled healthcare appointment (OR: 0.55; 95% CI [0.37, 0.81]). Older respondents had higher odds of resorting to alternative healthcare (OR: 1.02; 95% CI [1.01, 1.04]) and being unable to attend medical appointments (OR: 1.02; 95% CI [1.00, 1.04]).

Participants with primary or secondary level education had significantly lower odds of resorting to alternative healthcare services (OR: 0.53; 95% CI [0.29, 0.97]) compared to respondents who had a postgraduate degree. In addition, respondents who had public insurance had higher odds of being unable to attend a healthcare appointment during the COVID-19 pandemic than those who did not have insurance (OR: 1.62; 95% CI [1.07, 2.44]). Lastly, participants who reported having critical medical needs had lower odds of facing any challenges accessing medical health care (OR: 0.37; 95% CI [0.23, 0.60]), and greater odds of resorting to alternative medical care (OR: 5.65; 95% CI [3.48, 9.19]), and inability to attend healthcare appointment (OR: 1.92; 95% CI [1.14, 3.25]).

Table 1. Findings from the Descriptive Statistics of the Study Variables.

Variable		
Predisposing factors		
Mean age (SD)	33.13 (11.08) years old	
	Frequency	Percentage (%)
Sex at birth (n = 951)		
Male	527	55.4
Female	424	44.6
Missing	7	—
Education (n = 955)		
Secondary	173	18.1
University	596	62.4
Post-graduate	186	19.5
Missing	3	—
Relationship (n = 958)		
Living with partner	509	53.1
Living without partner	449	46.9
Work status (n = 958)		
Employed	510	53.2
Unemployed	130	13.6
Retired/students	318	33.2
Enabling factors		
Medical insurance (n = 958)		
Yes, public insurance	258	26.9
Yes, private insurance	244	25.5
No	456	47.6
Financial loss (n = 958)		
Yes	331	34.6
No	627	65.4
Need factor		
Critical medical needs (n = 784)		
Yes	88	11.2
No	696	88.8
Missing	49	—
Access factors		
Challenges accessing medical care (n = 654)		
Yes	469	71.7
No	185	28.3
Missing	304	—
Resort to alternative medical care (n = 653)		
Yes	160	24.5
No	493	75.5
Missing	305	—
Unable to attend health care provider appointment (n = 566)		
Yes	176	31.1
No	390	68.9
Missing	392	—

Discussion

This study showed that enabling factors were associated with the utilization of healthcare services during the COVID-19 pandemic among residents of Saudi Arabia. Experiencing financial loss was associated with lower odds of seeking alternative medical care and being unable to attend a scheduled healthcare appointment yet raised the odds of experiencing challenges to access healthcare services. Another enabling factor that affected access to healthcare was healthcare insurance. The odds of being unable to make a healthcare appointment during the COVID-19 pandemic increased for those who had public insurance compared to those who did not have insurance. In terms of predisposing factors, educational status appears to influence these relationships as participants who had primary or secondary school education had significantly lower odds of resorting to alternative medical

Table 2. Factors Associated with Healthcare Utilization During the COVID-19 Pandemic.

	Challenges accessing medical healthcare services (*N* = 654)		OR [95% CI]	Resort to alternative medical healthcare services (*N* = 653)		OR [95% CI]	Unable to attend healthcare appointment (*N* = 566)		OR [95%CI]
	No	Yes		No	Yes		No	Yes	
	N = 185	*N* = 469		*N* = 493	*N* = 160		*N* = 390	*N* = 176	
Independent variables	*n* (%)	*n* (%)	*p*-Value	*n* (%)	*n* (%)	*p*-Value	*n* (%)	*n* (%)	*p*-Value*
Age mean (*SD*)	33.78 (11.69)	33.28 (10.81)	0.99 [0.98, 1.01] 0.59	32.91 (10.82)	35.57 (12.21)	1.02 [1.01, 1.04] **0.01**[a]	33.12 (10.34)	35.85 (13.16)	1.02 [1.00, 1.04] **0.01**[a]
**Sex at birth*									
Male	110 (59.5)	247 (52.7)	1.25 [0.91, 1.71] 0.17	268 (54.4)	86 (53.8)	1.04 [0.75, 1.42] 0.83	225 (57.7)	92 (52.3)	1.29 [0.92, 1.79] 0.14
Female	73 (39.5)	217 (46.3)	1.00	220 (44.6)	72 (45.0)	1.00	164 (40.1)	82 (46.6)	1.00
Relationship									
Living with partner	97 (52.4)	256 (54.6)	0.92 [0.65, 1.29] 0.62	261 (52.9)	97 (60.6)	0.73 [0.51, 1.05] 0.09	219 (56.2)	96 (54.5)	1.07 [0.75, 1.53] 0.72
Living without partner	88 (47.6)	213 (45.4)	1.00	232 (47.1)	63 (39.4)	1.00	171 (43.8)	80 (45.5)	1.00
**Education*									
Primary/secondary	24 (13)	64 (13.6)	1.43 [0.80, 2.57] 0.22	88 (17.8)	20 (12.5)	0.53 [0.29, 0.97] **0.04**[a]	71 (18.2)	30 (17)	0.91 [0.51, 1.63] 0.76
University	120 (64.9)	284 (60.6)	0.97 [0.64, 1.48] 0.89	309 (62.7)	99 (61.9)	0.74 [0.48, 1.14] 0.17	238 (61)	109 (61.9)	0.99 [0.63, 1.55] 0.97
Post-graduate	41 (22.2)	100 (21.3)	1.00	95 (16.3)	41 (25.6)	1.00	80 (20.5)	37 (21)	1.00
Work status									
Employed	100 (54.1)	265 (56.5)	1.10 [0.76, 1.61] 0.61	274 (55.6)	88 (55.0)	1.08 [0.72, 1.61] 0.72	217 (55.6)	95 (54)	0.84 [0.56, 1.25] 0.38
Unemployed	25 (13.5)	60 (12.8)	1.0 [0.57, 1.74] 1.00	58 (11.8)	24 (15.0)	1.39 [0.78, 2.47] 0.26	60 (15.4)	22 (12.5)	0.70 [0.39, 1.26] 0.23
Retired/students	60 (32.4)	144 (30.7)	1.00	161 (32.6)	48 (45.0)	1.00	113 (29)	59 (33.5)	1.00
Medical insurance									
Yes, public insurance	61 (33.0)	128 (27.3)	0.87 [0.58, 1.29] 0.48	138 (28.0)	47 (29.4)	1.04 [0.68, 1.58] 0.87	97 (24.9)	68 (38.6)	1.62 [1.07, 2.44] **0.02**
Yes, private insurance	38 (20.5)	133 (28.4)	1.45 [0.93, 2.25] 0.09	133 (27.0)	40 (25)	0.91 [0.59, 1.42] 0.69	115 (29.5)	31 (17.6)	0.62 [0.39, 1.00] 0.05
No	86 (46.5)	208 (21.7)	1.00	222 (45.0)	73 (45.6)	1.00	178 (45.6)	77 (43.8)	1.00
Financial loss									
Yes	65 (35.1)	112 (23.9)	1.73 [1.19, 2.50] **0.004**[a]	120 (24.3)	54 (33.8)	0.63 [0.43, 0.93] **0.02**[a]	90 (23.1)	62 (35.2)	0.55 [0.37, 0.81] **0.003**[a]
No	120 (64.9)	357 (76.1)	1.00	373 (75.7)	106 (66.2)	1.00	300 (76.9)	114 (64.8)	1.00
**Critical medical needs*									
Yes	38 (24.1)	43 (9.2)	0.37 [0.23, 0.60] <**0.001**[a]	35 (7.1)	47 (29.4)	5.65 [3.48, 9.19] <**0.001**[a]	37 (9.5)	29 (16.5)	1.92 [1.14, 3.25] **0.02**[a]
No	137 (74.1)	416 (88.7)	1.00	446 (90.5)	106 (66.3)	1.00	341 (87.4)	139 (79)	1.00

Note. [a]Pearson's goodness-of-fit test value Pr ChiSq > 0.50.
*Missing response.

care than respondents who had a postgraduate degree. In terms of need factors, those with critical medical needs had lower odds of facing any challenges accessing medical care but also had greater odds of resorting to alternative medical care and inability to attend healthcare appointments.

This study therefore provides evidence of the impact of the COVID-19 pandemic on healthcare utilization in Saudi Arabia and pinpoints associated factors. The study not only highlights the impact of financial loss on healthcare service utilization of residents in Saudi Arabia during the pandemic, but also raises a disconcerting finding concerning the plausible role of public health insurance on the impact of the pandemic on healthcare utilization as diminishing during a pandemic.

The study is however not without drawbacks. First, self-reported data may be subjected to recall bias, and the information on healthcare utilization and financial loss could be subjected to over-reporting or under-reporting. Second, data on health-seeking behaviors of participants before COVID-19 were not recorded, and as such, claims cannot be made about the observed under-utilization of health services as due exclusively to the pandemic. Third, participants' nationality was unknown, and respondents may have included expatriates working in the private sector deprived of the free public healthcare services and financial support privileges available to Saudi nationals. Lastly, the high number of participants in the present study with a university education presents limitations in the generalizability of findings to wider populations.

Nevertheless, this study has identified several important findings. It was observed that about 20% of respondents expressed challenges in accessing healthcare services and attending their medical appointments during the pandemic which confirms previous studies conducted in Malaysia (Yunus et al., 2021), South Korea (Lee & You, 2021), and Hong Kong (Hung et al., 2022). Reduced or delayed healthcare utilization and access to routine medical care can have detrimental health consequences and may increase the mortality and morbidity associated with COVID-19 infection especially among elderly and senior citizens (Mehrotra et al., 2020; Michalowsky et al., 2021; Richards et al., 2020). It is therefore essential that access to medical care is assured through multiple routes during an emergency crisis. Possible means of healthcare delivery include telehealth, home visits, and mobile health units accessible to all socioeconomic groups. These alternative routes have been used in the United States, United Kingdom, China, Canada (Monaghesh & Hajizadeh, 2020), as well as Saudi Arabia (Al-Rayes et al., 2021) during the pandemic.

Interestingly, health insurance played no role in facilitating utilization of healthcare services during the pandemic. Factors previously identified as having a role in healthcare utilization, namely finance-related, were expected to change during crisis. For example, Kim et al. (2021) observed a decline in healthcare utilization during the pandemic although Korea has health insurance that covers the entire population, as well as the highest medical utilization in the world. Studies assessing health insurance as an enabling factor based on Andersen's healthcare utilization theory have looked at the effect of ethnicity and the type of health insurance (Babitsch et al., 2012). In Saudi Arabia, social loans worth more than 4 billion Saudi riyals (over 1 billion USD) were provided by the Saudi Arabian Monetary Authority and Ministry of Finance to low-income Saudi families during the COVID-19 pandemic (Bashir et al., 2021; Initiatives and services-KSA, 2019). However, the large migrant workforce in the country had limited access to these support systems, and a reduction in their salary and remittances (Khan et al., 2021).

Nonetheless, all COVID-19 related healthcare services (testing, treatment, and vaccination) were offered free to all residents irrespective of nationality. As such, "public insurance" as a facilitating factor to healthcare services might not be significant in this context. Another factor that could have masked the possible relieving effect of health insurance is the restrictions imposed by the government, as all elective treatments were suspended and hospital visits were prohibited during the first wave of the pandemic (Algaissi et al., 2020; Communication Government Center-KSA, 2020). Also, the fear of contracting the infection led many individuals to avoid the hospital (Bashir et al., 2021; Lazzerini et al., 2020). Studies are needed to identify how to ensure the continued provision of safe routine medical care through alternative healthcare routes easily accessible by all residents during pandemics of the magnitude of COVID-19.

Use of alternative medical care, practices, and products not part of conventional medicine (Tabish, 2008) increased during the first wave of the COVID-19 pandemic and was significantly higher among participants with lower educational status. About 60% to 75% of Saudis use alternative healthcare (Alrowais & Alyousefi, 2017) mainly due to the privatization of healthcare services (Khalil et al., 2018). The higher cost of obtaining conventional services may explain the reason why significantly more participants with lower educational level accessed alternative healthcare services during the pandemic in the current study. Alternative healthcare is used by Saudis for many health conditions ranging from headaches to smoking cessation, mental disorders, diabetes and other noncommunicable diseases (Khalil et al.,

2018). Alternative medicines are also used because of its linked to "Prophetic Medicine (the advice given by the prophet Muhammad with regards to sickness, treatment and hygiene as found in the Koran)" (Khalil et al., 2018). The high use of alternative medical care by people with low educational status was also reported in the United States (Nahin et al., 2010).

The socio-behavioral model (Andersen, 1995) identifies the role of socio-economic factors in accessing health care (Webair & Bin-Gouth, 2013). Persons with lower educational status are more likely to experience unmet healthcare needs during the COVID-19 pandemic (Kim et al., 2021) because of limited access to information, other non-material resources, and lower resourced occupation that make it more difficult to promote healthy living (Lahelma et al., 2004). During the stringent lockdown in Saudi Arabia, individuals had to download and use online applications to get an appointment in public healthcare facilities (Hassounah et al., 2020). Individuals with low illiteracy and computer competency may have found it difficult to navigate access to the telehealth service delivery.

The current study did not find any association between employment status and healthcare utilization in this study. Being employed was expected to increase the odds of having access to healthcare services (Anderson et al., 2021). Unemployment rates during the pandemic different across countries (Jiskrova et al., 2021) and country-level characteristics such as income and wealth distribution may modify the financial impact of the COVID-19 (Lekfuangfu et al., 2020). Therefore, the results of this study may be specific only to the context of Saudi Arabia.

Similarly, no association was found between sex of participant and healthcare seeking behavior. Reports on the relationship between sex and healthcare seeking behavior during the COVID-19 pandemic are contradictory. Some studies have found no sex differences in health service utilization during the pandemic (Anderson et al., 2021; Wong et al., 2020), while another showed that women had better healthcare-seeking behaviors (Nguyen et al., 2021). However, most studies reported that females tend to avoid healthcare during the pandemic (Jiskrova et al., 2021; Kang, 2013; Yunus et al., 2021). Women were more likely to have suffered from anxiety and insomnia during the pandemic (Wong et al., 2020) and more likely to experience unmet healthcare needs than men (Kim et al., 2021) which may, in turn, have been affected by strategies employed to cope with the pandemic (Teferu Engida et al., 2021).

In the current study, older individuals were more likely to resort to alternative healthcare and had higher odds of being unable to attend medical appointments. The association between age and healthcare utilization based on Andersen's Model had been documented in many previous studies (Babitsch et al., 2012; Kim et al., 2021). The direction of the associations observed differed based on other demographical and behavioral characteristics such as ethnicity, or substance abuse as well as the type of healthcare accessed (Babitsch et al., 2012). Strict measures were imposed in Saudi Arabia during the first wave of the pandemic limiting the movements of individuals especially older adults, and routine medical care was provided exclusively through telehealth and virtual consultations (Algaissi et al., 2020; Communication Government Center-KSA, 2020; Tabish, 2008). Older adults may not have been able to make their medical appointments, which increases the likelihood of seeking alternative healthcare services.

We found that participants with critical medical needs had lower odds of facing any challenges accessing medical health care, but greater odds of resorting to alternative medical care as well as being unable to attend healthcare appointments. A similar finding was reported from South Korea where the probability for unmet medical care increased with the increase in the number of chronic diseases (Kim et al., 2021). The intensive awareness campaigns that encouraged older adults and those with critical conditions to stay at home (Algaissi et al., 2020; Bashir et al., 2021; Communication Government Center-KSA, 2020) during the pandemic in addition to fear of contracting infection in hospital settings (Lazzerini et al., 2020) may have resulted in older respondents skipping medical appointments and resorting to alternative medical care. Saudi Arabia has initiated many routes for healthcare delivery during the pandemic with more care and opportunities for patients with medical conditions or critical health needs given their increased morbidity and mortality in case of contracting the infection (Bashir et al., 2021; Hassounah et al., 2020; Hung et al., 2022).

Conclusion

The financial loss suffered by individuals during the COVID-19 pandemic has impacted all measures of healthcare utilization. Tailored educational interventions, as well as financial support, may help to address COVID-19 associated financial inequalities that influence healthcare utilization. Policymakers could monitor changes in healthcare utilization, especially during pandemics, in order to avoid detrimental health consequences that might be faced by those at risk of not being able to access alternative arrangements for healthcare provision.

Authors' Note

This research was conducted while (Ntombifuthi Nzimande) was at (Department of Economic and Human Geography, Faculty of Science and Informatics, University of Szeged, H-6722 Szeged, Hungary). They are now at (University of KwaZulu-Natal, Department of Geography, College of Humanities, 4360, South Africa) and may be contacted at (nzimandentombifuthi@gmail.com). This research was conducted while (Anthonia Omotola Ishabiyi) was at (Centre for Rural Health, School of Nursing and Public Health, University of KwaZulu-Natal, Durban, South Africa). They are now at (Department of Sociology, University of Cincinnati, Cincinnati, Ohio 45221, USA) and may be contacted at (paduatonia@yahoo.com).

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Authors' Contributions

BG conceptualized the study and developed the first draft of the manuscript. MFAQ conducted the statistical analysis. MOF the main principal investigator, managed the data for the study, contributed extensively to the study design, reviewed and revised the manuscript for important intellectual content. BB, MET, NK, JCO, NPN, JV, PE, NMA, AOO, FBL, MAY, MJ, OE, EA, MAA, II, GFA, AT-AK, BOP, BU, RAAZ, NN, ZK, JL, and ALN reviewed the multiple drafts of the manuscript and made intellectual inputs. All the authors approved the final version of the manuscript.

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Supplemental Material

Supplemental material for this article is available online.

Data Availability Statement

The data can be obtained from the principal investigator upon reasonable request.

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