



How do perceptions of public health measures affect experience of unmet healthcare needs among older Korean adults during COVID-19 pandemic?

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ABSTRACT

Increasing difficulties in the use of healthcare services after the COVID-19 outbreak is a major concern as ensuring access to healthcare services is a primary health policy goal. The aim of this study was to examine the impacts of public perceptions regarding COVID-19 related public health measures on older adults' experience of unmet healthcare needs in Korea. A total of 1961 participants from the Korea Health Care System Performance, over the age of 65, were included in the analyses. Three different logistic regression models were used to assess the impact of public perceptions – understanding, trust and satisfaction- regarding COVID-19 public health measures on unmet healthcare needs. Our results show that a poor understanding of public health measures was associated with higher odds of unmet healthcare needs among Korean older adults (OR:2.65, 95%CI: 1.79–3.94). However, trust and satisfaction of public health measures were not related to unmet healthcare needs. Our findings suggest that the importance of effective risk communication to facilitate better understand quarantine policies rather than emphasizing trust or satisfaction over public health measure.

1. Introduction

Ensuring timely access to necessary care is one of top policy priorities. (Docteur, 2004; Levesque et al., 2013) Limited or inadequate access to needed care may prompt people to forgo care altogether and eventually experience a deterioration in their health. (Sommers et al., 2012; Rashidian et al., 2019) While access to care is a major policy agenda in many countries, the concern has increased in light of the recent Coronavirus disease (COVID-19) outbreak since it may prohibit people's access to and the utilization of healthcare services. (Miralles et al., 2021; Coley and Baum, 2021) For example, it has been reported that the COVID-19 pandemic has disrupted access to health care and increased unmet healthcare needs due to increased burdens on health systems. (World Health Organization, 2021) In addition, public health measures caused disruptions in the provision of health services, (Vervoort, 2020; Mansfield et al., 2021) and fears of infection led people to underuse primary care and emergency department services. (Miralles et al., 2021; Mansfield et al., 2021)

One of the indicators widely used to assess difficulties in accessing healthcare services is self-reported unmet needs, which provides individuals' subjective assessments of their experiences with health care

and can arise for a variety of reasons, including problems with availability, accessibility, and acceptability. (Allin et al., 2010; Sibley and Glazier, 2009; Chen and Hou, 2002) While unmet needs have been considered to be more concentrated in disadvantaged populations, recent studies reported that it has become more pervasive among women, people in worse economic situations and those with poor health after the COVID-19 pandemic. (Smolić et al., 2021; Burgette et al., 2021) Moreover, a recent study revealed that countries with higher universal health coverage and stricter containment and closure policies were more likely to experience difficulties in accessing health services. (Smolić et al., 2021) In Korea, while socio-economic status and health status were negatively related to unmet healthcare needs, individuals who experienced unmet healthcare needs perceived quality of care and healthcare system as poor. (Huh and Lee, 2016) Given that people report experience of unmet healthcare needs when the health system is less responsive than the public expectations, (Huh and Lee, 2016; Ramos et al., 2019) public perceptions of the response of the health system to the COVID-19 pandemic, in particular perceptions of public health measures may be expected to have an impact on unmet healthcare needs. In addition, Andersen's Behavioural Model of Health Services, which is one of the most used conceptual models, also supports the

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concept that individual perception of the environment, which is defined as contextual dimension, can influence the use of health services. (Andersen, 1995) During the current pandemic situation, perceptions of preventive public health measures can be directly connected to perceptions regarding the health system. For instance, a study focusing on European countries suggests that different epidemic control measures in individual countries influenced the use of health care services, indicating that individuals aged 50 and older living in a country with a strict public health measure were less likely to have forgone or have had medical treatments postponed regardless of the robustness of the healthcare system. (Smolić et al., 2021) In this sense, good understanding and trust for COVID-19-related public health measures may reduce unmet needs. Especially, perceptions of the COVID-19 response policy could affect unmet needs in countries that have not implemented a strict lockdown, such as South Korea.

South Korea has successfully lowered the number of new COVID-19 cases and maintained a low mortality rate through strong national response, despite registering the second highest number of cases worldwide during the early stages of the COVID-19 pandemic. This can be attributed to the fact that South Korea experienced the outbreak of Middle East respiratory syndrome in 2015, which helped raise awareness of the importance of institutional preparedness and quick response to infectious diseases. (Lim et al., 2021) The Korea's public health measures include early detection of the infection and rapid activation of national response protocols led by national leadership; the rapid establishment of diagnostic capacity; scaling up of measures for preventing community transmission; redesigning the triage and treatment systems; and mobilizing the necessary resources for clinical care. (Oh et al., 2020) Consequently, South Korea checked the widespread transmission of the virus without introducing a national lockdown, thereby preventing the pandemic from leading to economic panic. With respect to healthcare services, the government implemented several policies in order to ensure access to essential services and to reduce exposure to COVID-19 infections. For instance, the government allows phone consultations and prescriptions for all citizens if there is no safety problem, and further proxy prescriptions for self-isolated people, older adults, and chronic disease patients if the same prescription has been given for a long period of time and if there is no safety problem. (Ministry of Health Welfare, 2020)

Despite the successful responses to the ongoing pandemic, it is still plausible that Korean older adults may have difficulties in access to and use of necessary care as they tend to have more complicated healthcare needs even before the COVID-19 pandemic. (Kim et al., 2018) Considering that the responsiveness of the healthcare system may affect unmet care needs, public perceptions of COVID-19-related public health measures may be associated with unmet healthcare needs during the pandemic, especially among older adults. However, there is little evidence on the impacts of public perceptions regarding COVID-19-related public health measures on unmet healthcare needs. This study aims to examine the impact of public perception regarding COVID-19-related public health measures on unmet healthcare needs among older adults during the ongoing pandemic situation in Korea.

2. Material and methods

2.1. Study design

We used the Experience Survey on Healthcare Use of Older Adults during the COVID-19 Pandemic (COVID-19 Survey) from the Korea Health Care System Performance project implemented by the Korea Institute for Health and Social Affairs (KIHASA). The purpose of the COVID-19 Survey was to examine the healthcare system performance at the national level and the impact of COVID-19 on the healthcare system. (Kim et al., 2020) The project involved a cross-sectional study conducted between November 11 and December 5, 2020 and included data on older adults' experience of healthcare use in the wake of the COVID-19

outbreak in 2020. The survey was conducted through face-to-face interviews using a pretested structured questionnaire and the Computer-Assisted Personal Interview (CAPI) methodology. Eligible participants were over the age of 65 and could communicate in Korean. Overall, 2000 survey participants were sampled among total 8,684,460 older adults by stratifying 17 metropolitan cities and provinces into 30 regions and distributing in proportion to the square root of the population of each region, which achieved for the objectives of the COVID-19 Survey. The distribution was made in a square root proportion according to the Resident Population Status of the Ministry of Public Administration and Security as of the end of October 2020. The districts to be surveyed were randomly selected in each region, and the subjects were chosen based on the allocation by gender and age group. Sample size and effect size data were entered into the G*Power 3.1.2 software, where post hoc analyses of achieved power were calculated. (Faul et al., 2007; Ellis, 2010)

The questionnaire was prepared referring to the existing national survey questionnaire. First, the questions on subjective health perception in health status and major diseases were prepared based on nationally representative survey dataset including the Korea National Health and Nutrition Survey (Kweon et al., 2014) and the Korea Health Panel Study (KHPS). (Sohn et al., 2021) Questions about health status before the COVID-19 outbreak and experiences of symptoms related to COVID-19 were prepared by referring to the COVID-19 questionnaire conducted by the Survey of Health, Aging and Retirement in Europe (SHARE). (Annette et al., 2020) The questions for COVID-19 public health measures were adapted from the KHPS. These measures such as unmet needs, chronic diseases and perception of health system have been used in many previous studies. (Huh and Lee, 2016; Choi et al., 2018; Sung and Lee, May 2019) After excluding missing information and non-response, a total of 1964 participants were included for the data analyses. The Institutional Review Board of KIHASA approved the protocol (KIHASA No. 2020-76). Written informed consent was obtained from all participants prior to the survey. The COVID-19 survey met the government public health guidelines for protection of survey participants concerning their safety and privacy.

2.2. Variables

2.2.1. Dependent variable: Experience of unmet healthcare needs

To assess individuals' experience of unmet healthcare needs, we used the question "After the COVID-19 outbreak (February 2020), was there ever a time when you felt that you needed healthcare but you didn't receive it?" Eligible responses were "Yes" or "No". Based on self-reported experience of unmet healthcare needs, we defined individuals experienced unmet healthcare needs if they responded "Yes".

2.3. Independent variable: perception of public health measures for COVID-19

Our independent variable of interest was individual perception of public health measures for COVID-19. This was based on participants' response to a close-ended survey, which rated three different indications of perception — perceived understanding, satisfaction, and trust of public health measures for COVID-19. To assess how well participants understood COVID-19-related public health measures, they were asked to respond to the following questions: "How would you rate your understanding, trust, and satisfaction of the public health measures for COVID-19, respectively?" Possible response options were "excellent", "very good", "good", "fair" and "poor", with the first three collapsed into "good" and the last two into "poor" for our analyses.

2.4. Covariates

Age, sex, educational attainment, marital status, labor participation, self-rated health, and chronic health conditions were selected as covariates based on prior literature and theoretical considerations. The

theoretical considerations were based on Andersen’s healthcare utilization model, which theorizes that healthcare-seeking behaviors are driven by predisposing characteristics, enabling resources, and need-based factors. (Andersen, 1995)

2.5. Statistical analysis

We hypothesized that perceptions of public health measures for the COVID-19 pandemic would be an important determinant of unmet healthcare needs, and the average proportion of individuals expressing self-reported unmet healthcare needs would vary by perceptions. We generated three different logistic regression models to examine the relationship between the perception of COVID-19-related public health measures and unmet healthcare needs. The first model examined the impact of understanding COVID-19 related public health measures on self-reported unmet healthcare needs, followed by trust and satisfaction over the measures. Data analyses were performed using STATA v.15, and survey weights were applied to all logistic regression analyses. The results were presented as odds ratio (OR) and 95% confidence intervals (CI)

3. Results

Table 1 presents the descriptive characteristics of the 1961 participants. Approximately, 8.8% (n = 173) of older adults reported that they had experienced unmet healthcare needs in the past year. Individuals aged 75 and older were more likely to report unmet needs compared to other age categories among seniors. Individuals with lower income and lower educational attainment indicated significantly more unmet healthcare needs compared to their counterparts with higher income and education levels. Unmet healthcare needs were significantly more common among those reporting poor self-rated health (n = 54, 12.8%). Approximately 9.5% of older adults with at least two chronic conditions reported the highest unmet healthcare needs, while those without any chronic condition reported the lowest unmet healthcare needs (7.8%).

The results for three different perceptions of public health measures for COVID-19 on unmet healthcare needs are presented in Table2. The findings showed that a poor understanding of public health measures was associated with higher odds of experiencing unmet healthcare needs among older adults (OR: 2.58, 95% CI:1.76–3.78). Across income levels (Q1, Q2), a higher likelihood of reporting unmet healthcare needs was consistently observed in three different logistic regression models. In addition, individuals aged 75 and older and the lowest educational level were associated with experiencing unmet healthcare needs across three different models. In contrast, individuals aged 70–74 reported a higher likelihood of experiencing unmet healthcare needs in Model 1. Older adults residing in non-Seoul metro regions were less likely to experience unmet healthcare needs during the pandemic. Those who self-reported poor health had higher odds of reporting unmet healthcare needs. Meanwhile, the number of chronic conditions, a proxy measure of objective health status, was not associated with individuals’ experience of unmet healthcare needs among older adults.

4. Discussion

This cross-sectional study examined how perceptions of public health measures related to COVID-19 were associated with unmet healthcare needs among older Korean adults during the pandemic. Our results show that a poor understanding of public health measures was associated with higher odds of unmet healthcare needs among older Korean adults. While many studies on unmet healthcare needs following the COVID-19 outbreak focused on identifying barriers to healthcare services, our study aimed to examine how perceptions — understanding, trust, and satisfaction — regarding public health measures influenced older adults’ experience of unmet healthcare needs in the past year. Our study yields important findings that can be embedded for developing

Table 1

Descriptive characteristics of the study sample by experiencing of unmet healthcare needs during the COVID-19 outbreak in 2021 (n = 1961).

Variables		Overall unmet health care needs		
		Yes (n = 173)	No (n = 1788)	p-value
		Number (%)		
Sex	Female	108 (9.8)	999 (90.2)	0.10
	Male	65 (7.6)	789 (92.4)	
Age	65–69	54 (8.5)	579 (91.5)	0.57
	70–74	38 (7.9)	442 (92.1)	
	75 & over	81 (9.6)	767 (90.5)	
Income [†]	Q1	109 (10.6)	916 (89.4)	<0.01
	Q2	51 (8.7)	535 (91.3)	
	Q3	13 (3.7)	337 (96.3)	
Education	Elementary	109 (12.4)	771 (87.6)	<0.01
	Junior high	37 (7.0)	495 (93.0)	
	High & Post-secondary	27 (4.9)	522 (95.1)	
Region	Seoul metro region	131 (17.2)	632 (82.8)	<0.01
	Non-Seoul metro regions	42 (3.5)	1156 (96.5)	
Work	Currently work	49 (6.9)	659 (93.1)	0.03
	No work	124 (9.9)	1129 (90.1)	
Self-rated health	Good	119 (7.7)	1420 (92.3)	<0.01
	Bad	54 (12.8)	368 (87.2)	
Chronic condition	None	46 (7.8)	547 (92.2)	0.74
	1	58 (9.1)	581 (90.9)	
	2	46 (9.5)	436 (90.5)	
	3+	23 (9.3)	224 (90.7)	
Understanding public health measures	Good	57 (5.2)	1039 (94.8)	<0.01
	Poor	116 (13.4)	749 (86.6)	
Trust public health measures	Good	121 (8.7)	1263 (91.3)	0.85
	Poor	52 (9.0)	525 (91.0)	
Satisfaction of public health measures	Good	109 (8.0)	1251 (92.0)	0.06
	Poor	64 (10.7)	537 (89.3)	

[†]Q1: <1 million won(approx. 868 USD), Q2: <2 million won, Q3: more than 2 million won

health policies to address unmet healthcare needs among older adults amid the COVID-19 pandemic.

First, we found that a poor understanding of public health measures was significantly associated with unmet healthcare needs. In previous studies, perceived barriers to healthcare access were negatively related to healthcare utilization, implying that poor perception of the healthcare environment could be a possible barrier to access and use of healthcare services. (Hwang et al., 2017; Bataineh et al., 2019; Hajek et al., 2020) The perception of the physical and social environment is a cumulative indicator reflecting an individual’s view of service availability,

Table 2
Odds and 95% CIs from logistic regression models examining perception of COVID-19 public health measures and unmet needs among Korean older adults (n = 1961).

Variables		Model 1		Model2		Model3	
		Understanding of public health measure		Trust of public health measure		Satisfaction of public health measure	
		OR	95% CI	OR	95% CI	OR	95% CI
Perception of public health measure	Poor	2.58*	1.76–3.78	0.91	0.61–1.34	1.16	0.80–1.69
Sex	Female	0.88	0.60–1.31	0.97	0.66–1.43	0.96	0.65–1.42
Age	70–74	0.56*	0.33–0.94	0.61	0.36–1.03	0.60	0.35–1.01
	75 & over	0.44*	0.26–0.74	0.54*	0.33–0.88	0.53*	0.32–0.87
Income [†]	Q1	2.79*	1.12–6.96	2.59*	1.07–6.27	2.69*	1.10–6.62
	Q2	2.31*	1.04–5.13	2.33*	1.08–5.02	2.36*	1.08–5.13
Education	Elementary	4.10*	2.25–7.49	3.76*	2.10–6.72	3.85*	2.17–6.85
	Junior high	1.62	0.88–3.00	1.53	0.85–2.75	1.54	0.85–2.77
Region	Non-Seoul metro regions	0.11*	0.07–0.16	0.10*	0.07–0.15	0.10*	0.07–0.15
Work	No work	0.79	0.47–1.33	0.79	0.47–1.34	0.78	0.46–1.32
Self-rated Health	Bad	1.78*	1.14–2.77	1.93*	1.24–3.02	1.92*	1.24–2.99
Chronic condition	1	1.32	0.84–2.06	1.22	0.78–1.91	1.20	0.77–1.89
	2	1.32	0.80–2.20	1.26	0.76–2.08	1.23	0.75–2.04
	3+	0.99	0.50–1.95	0.95	0.47–1.92	0.93	0.46–1.87

*p < 0.05

[†]Q1: <1 million won(approx. 868 USD), Q2: <2 million won

satisfaction, quality, and expectation. (Bernard et al., 2007) During the COVID-19 global pandemic, how well individuals understand its related public health measures could help improve healthcare services. As previous study highlighted, a good understanding of strict epidemic control measures may have minimized fear of infection or postponement of scheduled medical appointment. (Smolić et al., 2021) From a health policy perspective, it is worth noting that proper understanding of public health measures becomes a crucial factor to promote healthcare services, since it reflects objective conditions of the physical and social environment. As suggested in previous studies, it is imperative to alleviate fears about exposure to the virus by promoting public health measures to tackle the unmet healthcare needs of older adults. (Han et al., 2021; Siebenhaar et al., 2020)

In contrast, our finding highlights that trust and satisfaction with public health measures were not associated with older adults' experience of unmet healthcare needs. While there is limited evidence, this may be explained by the Protection Motivation Theory. This theory proposes that people protect themselves based on threat appraisal, the perceived severity of a threatening event or the perceived probability of the occurrence, coping appraisal, and perceived response efficacy. (Somestad et al., 2015; Rogers, 1975) While there are ongoing threats and fears regarding COVID-19, older adults who understood public health measures well may have a lower perception about the severity of the outbreak and higher perceived response efficacy, which could lead to seeking their required health services as usual. A recent study found that knowledge-based efficacy, such as awareness about the virus and methods to protect oneself, gives "a pathway to compliance without fear". (Bavel et al., 2020; Jørgensen et al., 2021) Accordingly, how well individuals are aware of or know about the control measures rather than trust or are satisfied with it could help alleviate fear or stress about possible exposure to the virus, so that they are less likely to experience difficulties in receiving the required care.

According to our findings, it may be important for people to better understand quarantine policies regardless of trusting and expressing satisfaction over public health measures, which implies the importance of risk communication such as providing accurate and adequate information, without concealing, and helping people to better understand the situation in the event of a pandemic outbreak. During the ongoing COVID-19 pandemic, vast volumes of information, including false or misleading information in digital and physical environments spread rapidly, which can be characterized as an infodemic. (The Lancet Infectious Diseases, 2020) The World Health Organization has stated that many health structures are not only fighting against an epidemic, but

also massive waves of information that often causes undesired consequences. (Siebenhaar et al., 2020) An increasing number of studies have highlighted that infodemic resulting in mis- and disinformation undermine public health responses and threaten people's physical and mental health. (Wang et al., 2020) False information could impede effective risk management by unintentionally encouraging misbehaviors interfering with addressing the pandemic. (Siebenhaar et al., 2020) This is particularly a problem for older adults who could feel distressed or anxious by misleading information, which ultimately could increase their fears so that they avoid seeking necessary healthcare services. (Dubey et al., 2020) Taking into account our findings suggesting a good understanding of the COVID-19-related control measures is associated with a lower likelihood of experiencing unmet healthcare needs, it is crucial to ensure that the public is well-informed with science-based evidence, so that they can react appropriately to the pandemic by coping with fears of redundancy.

Furthermore, our findings indicate that older adults with chronic conditions are not associated with higher odds of experiencing unmet healthcare needs, in a shift from existing studies. (Min et al., 2018; Gonzalez et al., 2021) A previous study reported that individuals with chronic conditions, particularly those with multiple conditions, were more likely to have delayed or forgone care than those with no chronic condition. (Dighe et al., 2020) It was suggested that the higher rate of unmet healthcare needs in older adults with chronic conditions may be caused by greater difficulty in identifying service providers due to mobility restrictions and higher burden of service providers. (Smolić et al., 2021) Unlike other countries that introduced strict travel restrictions and a complete lockdown, Korea's public health measures for COVID-19 still focus on early detection, prompt epidemiological investigation, and contact management, along with emphasis on social distancing (Dighe et al., 2020). Owing to the relatively less restrictive control measures, older adults with chronic conditions may have limited or no difficulties in accessing the services.

Some limitations of this study have been identified. Using cross-sectional data, it is difficult to examine the causality between individual perception and experience of unmet healthcare needs. It can be acknowledged that a wide range of factors that were not included could also impact unmet needs, such as provider characteristics. Also, the reasons for experiencing unmet healthcare needs are ambiguous. Previous research has shown that unmet healthcare needs can arise for a variety of complex reasons, including personal choice, financial barriers, or lack of services, and each factor for experiencing unmet needs requires a different policy approach. (Allin et al., 2010; Chen and Hou,

2002; Kim et al., 2018) As the COVID-19 situation is still far from over, there is a need to collect and monitor information on accessibility and utilization of healthcare services in older adults. This study used individual's perceived unmet need that may have overlooked the clinical factors associated with unmet healthcare needs at the individual level. However, previous studies suggest that self-reported experiences of unmet needs can be an appropriate measure when utilizing secondary data.(Allin et al., 2010; Hwang et al., 2017) It also should be mentioned that individual's perception of public health measure we used in this study may not be fully reflected as the perception was obtained from simple survey questions. Given this limitation of the survey data, the interpretations of our results should be taken with caution.

5. Conclusions

Our study demonstrated that public perceptions of COVID-19 control measures effect on experience of unmet healthcare needs among Korean older adults; older adults with a poor understanding of public health measures were more likely to experience unmet healthcare needs during the ongoing COVID-19 outbreak, whereas no effects of perceptions such as trust and satisfaction of the control measure on unmet needs were observed. The empirical information demonstrates the importance of effective risk communication policies by providing accurate and adequate information of COVID-19 public health measures to tackle unmet healthcare needs among older adults.

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7. Research data for this article

The data that support the findings of this study are available from Korea Institute for Health and Social Affairs (<https://data.kihasa.re.kr/>), but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Korea Institute for Health and Social Affairs.

CRedit authorship contribution statement

Jongnam Hwang: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. **Sujin Kim:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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