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Working Paper

Factors contributing to differences in unmet healthcare needs among vietnamese older persons between pre- and post-covid-19 pandemic periods: Evidence from national surveys

ADB Working Paper, No. 1463

Provided in Cooperation with:

Asian Development Bank Institute (ADBI), Tokyo

Suggested Citation: Thuy Tien Ngoc Doan; Long Thanh Giang (2024) : Factors contributing to differences in unmet healthcare needs among vietnamese older persons between pre- and post-covid-19 pandemic periods: Evidence from national surveys, ADB Working Paper, No. 1463, Asian Development Bank Institute (ADBI), Tokyo,
<https://doi.org/10.56506/JBLR2189>

This Version is available at:

<https://hdl.handle.net/10419/305397>

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ADB Working Paper Series

**FACTORS CONTRIBUTING TO
DIFFERENCES IN UNMET HEALTHCARE
NEEDS AMONG VIETNAMESE OLDER
PERSONS BETWEEN PRE- AND
POST-COVID-19 PANDEMIC PERIODS:
EVIDENCE FROM NATIONAL SURVEYS**

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No. 1463
July 2024

Asian Development Bank Institute

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Suggested citation:

Thuy, T. N. D. and Long, T. G. 2024. Factors Contributing to Differences in Unmet Healthcare Needs Among Vietnamese Older Persons Between Pre- and Post-COVID-19 Pandemic Periods: Evidence from National Surveys. ADBI Working Paper 1463. Tokyo: Asian Development Bank Institute. Available: <https://doi.org/10.56506/JBLR2189>

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The first version of this paper was presented at "The National Economics University (NEU) – Asian Development Bank Institute (ADBI) Joint Conference on Policy Lessons for a Post-COVID Recovery" from 7 to 8 March 2024 in Tokyo, Japan. The authors would like to thank discussants and participants of this conference for providing useful comments. Special thanks should go to Dil Rahut (ADBI's Vice-Chair of Research) and Peter J. Morgan (ADBI's Senior Consulting Economist and Advisor to the Dean) for their insightful discussions. Any further comments and suggestions should be addressed to the corresponding author via his contact details above.

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Abstract

Unmet healthcare needs refer to the situation when individuals fail to use healthcare services identified as a necessity to avoid any health consequences. The COVID-19 pandemic imposed additional challenges for older persons in addressing their healthcare needs, especially in the context of social distancing or curfew. To the best of our knowledge, this is the first study to explore the differences in unmet healthcare needs between the pre-COVID-19 (in 2019) and post-COVID-19 (in 2022) periods in Viet Nam. This study, using two nationally representative surveys, aimed to assess the changes in unmet healthcare needs (including inpatient and outpatient healthcare) among Vietnamese older persons between these time points, and to quantify the factors contributing to these changes. The Blinder-Oaxaca decomposition method was applied to explore various demographic, socioeconomic, and health factors. Educational levels, social participation, and cognitive and remembering impairments were found to be statistically significant factors. As unmet healthcare needs leave older persons with serious health consequences, it is important to determine factors attenuating such unmet healthcare needs in order to propose appropriate interventions and policies to protect this vulnerable population.

Keywords: healthcare services, unmet healthcare needs, Blinder-Oaxaca decomposition, older persons, Viet Nam

JEL Classification: I12, I14, I15, I18, J14, P46

Contents

1.	INTRODUCTION.....	1
2.	DATA SOURCES AND METHODS	2
2.1	Study Participants and Data Source	2
2.2	Measurements of Unmet Healthcare Needs	2
2.3	Explanatory Variables	4
2.4	Data Analysis	5
3.	RESULTS.....	6
3.1	Changes in Unmet Healthcare Needs among Vietnamese Older Persons in 2019 and 2022.....	6
3.2	Aggregate and Detailed Decompositions of Changes in Unmet Healthcare Needs among Vietnamese Older Persons between 2019 and 2022	9
4.	DISCUSSION	11
5.	CONCLUSIONS	13
	REFERENCES	14

1. INTRODUCTION

The term “unmet needs for healthcare” (also known as “unmet healthcare needs”) refers to the situation when individuals fail to utilize services identified as a necessity to avoid any health consequences (Carr and Wolfe 2019). The main reasons for healthcare needs not being met are: i) accessibility of services (such as difficulties related to transportation from the place of residence to healthcare facilities); ii) availability of services (for instance, long waiting times for receiving healthcare and inability of healthcare facilities to supply the services); iii) acceptability of available services (such as health belief, attitudes, knowledge, and practice towards healthcare/healthcare services); and iv) affordability of available services (for example, ability and willingness to pay for health services) (Sibley and Glazier 2009; Allin, Grignon, and Le Grand 2010; Gao et al. 2022). While reasons i) and ii) are related to the health system and infrastructure, reasons iii) and iv) are associated with the patient context. Unmet healthcare needs reflect a failure in access to healthcare of a targeted population and a failure in the healthcare market. Moreover, unmet healthcare needs imply problems of healthcare inequalities in a health system.

The age structure of the Vietnamese population has been changing dramatically, resulting in a fast transformation from an “aging” population currently to an “aged” population by 2036 (General Statistics Office of Viet Nam 2021). As projected by General Statistics Office of Viet Nam (2021), the Vietnamese older population will account for about 25% of the total population in 2050, thus indicating numerous socioeconomic and health challenges for Viet Nam. Older persons tend to have higher healthcare needs than younger ones due to their health deterioration (such as functional declines and dependence) and higher prevalence of multimorbidities (mostly chronic diseases and non-communicable diseases). Although significant healthcare needs among older persons have been affirmed in the literature, unmet healthcare needs seem to be observed in several health systems (such as in Viet Nam, the Republic of Korea, the People’s Republic of China (PRC), Malaysia, Spain, and Germany), resulting in worsening illness severity, complications, and even mortality. Consequently, both financial and nonfinancial burdens of unmet healthcare needs on the health system in particular, and the society in general, have clearly been affirmed elsewhere. The COVID-19 pandemic, which started in Viet Nam in early March 2020, caused significant barriers for patients to accessing their needed healthcare services and impeded the healthcare system’s capacity as a healthcare service provider. Despite this, there has been a paucity of studies on the unmet healthcare needs among Vietnamese older persons, especially in the pre-COVID-19 and post-COVID periods.

To the best of our knowledge, this study is the first to explore the differences in unmet healthcare needs between the pre-COVID-19 (in 2019) and post-COVID-19 (in 2022) periods in Viet Nam, using national representative surveys of older persons. This study aimed to identify changes in the unmet healthcare needs among Vietnamese older persons between 2019 and 2022, and quantify attributable factors of these changes by using the Blinder-Oaxaca decomposition approach. This study proposed possible policy interventions for further improvements in relation to unmet healthcare needs.

In this study, the terms “older persons,” “respondents,” “participants,” and “individuals” were used interchangeably to indicate Vietnamese older persons (defined as those aged 60 and over).

2. DATA SOURCES AND METHODS

2.1 Study Participants and Data Source

Two data sets were used for the analyses, namely the Survey on Older Persons and Social Health Insurance in Viet Nam 2019 and the Viet Nam National Aging Survey 2022 (in short, OP and SHI 2019, and VNAS 2022, respectively). These data sources comprised nationally representative data on multiple aspects of Vietnamese older persons, including demographic characteristics, physical and mental health conditions, healthcare utilization, economic status, and social cohesion. The aggregate number of older persons was 6,232, of whom 3,049 were in the OP and SHI 2019 and 3,183 were in the VNAS 2022. The aforementioned surveys were approved by the Institute of Social and Medical Studies Institutional Review Board with Decision No. 01/HDDD-ISMS dated 12 July 2019, and Decision No. 04/HDDD-ISMS dated 18 July 2022, respectively.

There were reasons for choosing these two waves of data. First, they indicated the perceived unmet healthcare needs among Vietnamese older persons in 2019 (the pre-COVID-19 period) and in 2022 (the post-COVID-19 period). The COVID-19 pandemic has revealed both implicit and explicit problems in terms of older persons' health and healthcare access as well as healthcare systems (Farrell et al. 2020; Núñez, Sreenganga, and Ramaprasad 2021; Humboldt, Low, and Leal 2022). Consequently, the perceived unmet healthcare needs might have changed after the COVID-19 outbreak in Viet Nam for several reasons, such as social distancing and curfew, supply chain disruption in healthcare, and transportation barriers in regard to healthcare access. Second, the three-year interval between 2019 and 2022 is long enough for some implicit changes in the older population. The Blinder-Oaxaca decomposition method (Oaxaca 1973) was used to compare two groups of data in 2019 and 2022 in this paper.

2.2 Measurements of Unmet Healthcare Needs

Unmet healthcare needs refer to the self-assessment of whether inpatient and outpatient healthcare services that older persons received in the last 12 months prior to the survey met their needs. Thus, this study investigated unmet needs for both inpatient and outpatient healthcare services among older individuals.

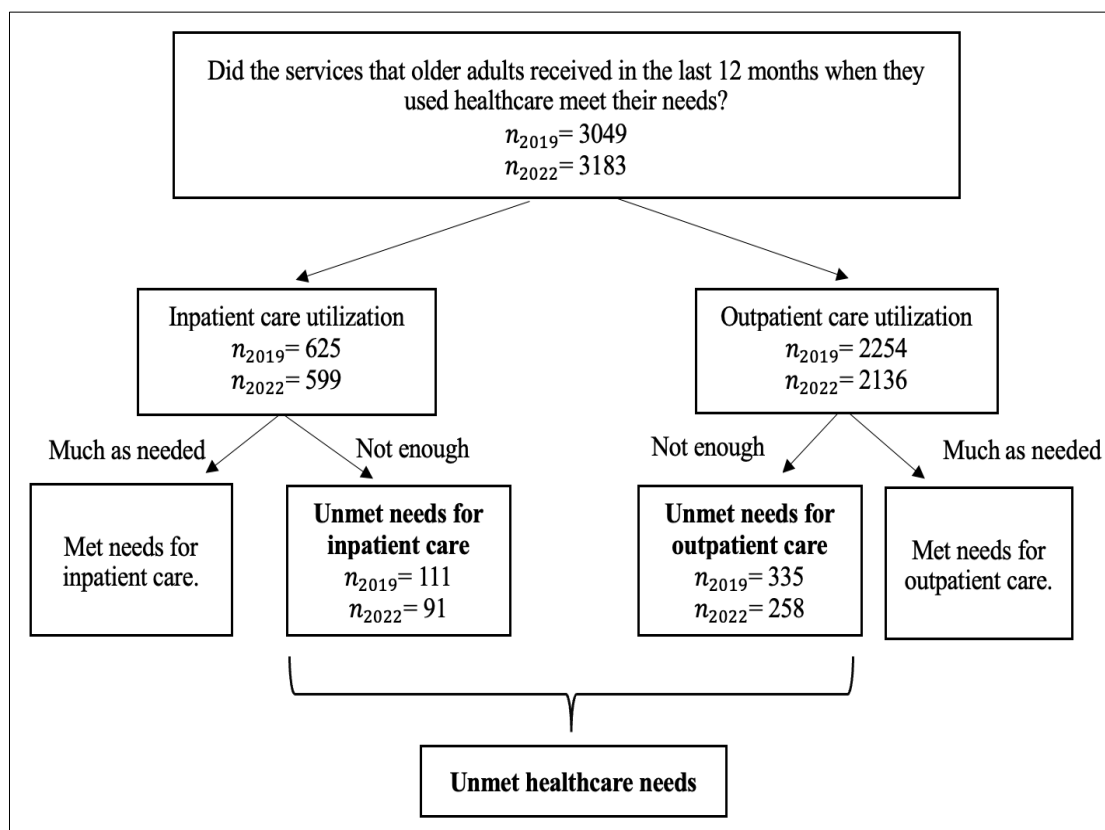
The unmet healthcare needs for inpatient and outpatient care were respectively measured using two questions: *"To what extent did the services that you received in the last 12 months when you used inpatient care meet your needs?"* and *"To what extent did the services that you received in the last 12 months when you used outpatient care meet your needs?"*. Participants were asked to respond either "Much as needed" or "Not enough." Those who self-assessed the inpatient/outpatient services that they received as not enough to meet their needs are defined as having unmet healthcare needs. Hence, two outcome indicators were used in this study: "unmet needs for inpatient care" and "unmet needs for outpatient care."

Figure 1 visualizes the determination of unmet healthcare needs among older persons in this study.

Among 3,049 older persons in the OP and SHI 2019, 625 respondents utilized inpatient care services. Of those, 111 respondents felt that they had not received as much as they needed. Among 3,183 older persons in the VNAS 2022, 599 respondents utilized inpatient care services. Of those, 91 respondents felt that they had not received as much as they needed.

As for outpatient care, in the OP and SHI 2019 cohort sample, 2,254 participants out of 3,049 older persons accessed inpatient care services, of whom 335 felt they had unmet needs for outpatient care. In the VNAS 2022 cohort sample, 2,136 participants out of 3,183 older persons accessed outpatient care services, of whom 258 felt they had unmet needs for outpatient care (Figure 1).

Figure 1: Determination of Unmet Healthcare Needs



Source: Own illustration, based on OP and SHI 2019, and VNAS 2022.

2.3 Explanatory Variables

As this study investigated the aspect of healthcare service utilization, the explanatory variables were chosen according to the Andersen and Newman healthcare utilization model, categorized into predisposing, enabling, and health-need factors (Andersen and Newman 2005). The Andersen and Newman model has been widely applied in previous literature (Kim and Lee 2016; Fu et al. 2018; Zhang, Liu, and Liu 2019). The application of the theoretical framework in this study was presented as follows:

- **The predisposing factors** provided demographic characteristics of older persons, which are considered a long-term foundation that reflects individuals' health beliefs and seeking behaviors. In this study, these factors are gender, age groups, living arrangements, marital status, and the highest education attainment of older persons.
- **The enabling factors** facilitated or impeded the healthcare-seeking behaviors of those who were in need. The factors being considered in this study included the financial aspect, place of residence, and social cohesion, as these factors were reported elsewhere in previous studies (Rahman et al. 2022; Murugan et al. 2024). In particular, the financial aspect refers to the healthcare affordability of older persons, and it is presented by: i) the wealth index quartile of households with older persons; and ii) the use of health insurance for paying healthcare services.

With regard to the household wealth quartile, for each cohort sample, it was derived from dividing household wealth indexes into four quartiles. Accordingly, the first and the fourth quartile represented the poorest and wealthiest groups, respectively. The principal component analysis (PCA) method was used to transform multiple household-related indicators into household wealth indexes. These indicators included household durable assets (e.g., television, refrigerator, and bicycle), hygiene quality (source of drinking water and toilet flush system), and housing quality (materials for roof and walls).

In terms of place of residence, older persons were classified into those living in urban areas and those living in rural areas.

Social cohesion refers to whether older persons participated in any social activities (such as visiting neighbors, meeting social groups at their places of residence, or participating in at least one religious group). Social participation is an important aspect of older persons that reflects their connectiveness as well as their communication with the society.

- **The health-need factors** reflect the health conditions of older persons, which directly generate healthcare needs. In this study, respondents were asked to self-rate whether they experienced any cognitive and memory impairments. Functional impairments were explored as health-need factors contributing to the unmet healthcare needs among older persons in the literature (Herr et al. 2014; Hoebel et al. 2017; Kim et al. 2018; Shah et al. 2021).

Table 1 shows the outcome variables and independent variables used in the analyses.

Table 1: Classification and Definition of Variables

Variable		Definition	Reference
Outcome variable			
Unmet needs for inpatient care		0 = No; 1 = Yes	No
Unmet needs for outpatient care		0 = No; 1 = Yes	No
Independent variables			
Predisposing factors	Gender	0 = Male; 1 = Female	Male
	Age group	0 = 60–69; 1 = 70–79; 2 = 80+	60–69
	Living arrangement	0 = Alone	Alone
		1 = With spouse only	
		2 = With at least one child	
		3 = Others	
	Marital status	0 = Married	Married
		1 = Widowed	
		2 = Others (Single/Separated/Divorced)	
Enabling factors	Highest education attainment	0 = No schooling/incomplete primary education	No schooling/ incomplete primary education
		1 = Complete primary	
		2 = Complete secondary	
		3 = College and above	
	Household wealth quartile	0 = 1st quartile (poorest quartile)	1st quartile
		1 = 2nd quartile (second-poorest quartile)	
		2 = 3rd quartile (second-wealthiest quartile)	
		3 = 4th quartile (wealthiest quartile)	
	Health insurance	0 = No; 1 = Yes	No
	Residence	0 = Urban; 1 = Rural	Urban
Health-need factors	Social participation	0 = No; 1 = Yes	No
	Cognitive impairment	0 = No; 1 = Yes	No
	Memory impairment	0 = No; 1 = Yes	No

Source: Own illustration, based on OP and SHI 2019, and VNAS 2022.

2.4 Data Analysis

The unmet needs for inpatient and outpatient care (outcome variables) among older persons between two cohort samples, as well as the variations of the outcome indicators with respect to the explanatory variables, were compared using Pearson's chi-squared tests.

The changes in unmet healthcare needs and the contributions of explanatory variables to these changes were explored by using the Blinder-Oaxaca decomposition analysis, which has been widely applied in health and healthcare disparities (Sen 2014; Zhang, Liu, and Liu 2019). As we generated nonlinear models (multivariate logistic regressions) for unmet healthcare needs, the extension of the Blinder-Oaxaca decomposition method was applied in this study (Bauer and Sinning 2008). More specifically, the extension of the Blinder-Oaxaca decomposition formula could be simplified as:

$$Y = F(X\beta), \quad (1)$$

where Y denotes the $N \times 1$ dependent variable vector, X is an $N \times K$ matrix of independent variables, and β is a $K \times 1$ vector of coefficients.

The difference in Y between A (the comparative group – the average rate of unmet healthcare needs in 2019) and B (the reference group – the average rate of unmet healthcare needs in 2022) could be decomposed as:

$$\begin{aligned}\overline{Y_A} - \overline{Y_B} &= \overline{F(X_A \beta_A)} - \overline{F(X_B \beta_B)} \\ &= \underbrace{\left\{ \overline{F(X_A \beta_A)} - \overline{F(X_B \beta_A)} \right\}}_E + \underbrace{\left\{ \overline{F(X_B \beta_A)} - \overline{F(X_B \beta_B)} \right\}}_C.\end{aligned}\quad (2)$$

For the multivariate logistic regression models, $F(X\beta)$ is transformed into $\frac{e^{X\beta}}{1+e^{X\beta}}$. The explained component E refers to the characteristic effect which measures the inequality due to the differences between the comparative group and the reference group in observed characteristics. The unexplained component C measures the inequality due to the differences in coefficients or effects.

All the statistical analyses were performed using STATA 14.0, with a p-value of less than 0.05 as the statistically significant level.

3. RESULTS

3.1 Changes in Unmet Healthcare Needs among Vietnamese Older Persons in 2019 and 2022

Table 2 shows the results for inpatient care. Overall, the rate of unmet needs among Vietnamese older persons decreased from 17.76% in 2019 to 15.19% in 2022, representing a 2.57 percentage point improvement. This change, however, was not statistically significant ($p = 0.226$). The unmet needs for inpatient care were found to vary significantly among some groups in both 2019 and 2022 cohort samples. More specifically, older persons who were in more advanced age groups and suffered from cognitive impairment experienced a higher percentage of unmet needs for inpatient care than those who were younger and had no cognitive impairment. As regards social cohesion, older persons who engaged in social activities had a lower percentage of unmet needs for inpatient care than those who did not participate in any social activities.

Memory impairment was found to be significant only in 2022. Older persons with memory impairment had a higher percentage of unmet needs for inpatient care than their counterparts in the 2022 cohort sample.

Table 3 presents the results for outpatient care. The rate of unmet needs reduced from 14.86% (2019) to 12.08% (2022), representing a 2.78 percentage point improvement. The change was statistically significant ($p = 0.007$). The unmet needs for outpatient care varied significantly among age groups, the highest level of education attainment, and functional impairment status. More specifically, those who were in more advanced age groups, had a higher level of education attainment, and suffered from communication and memory impairments had a higher percentage of unmet needs for outpatient care than their counterparts in both 2019 and 2022 cohort samples. With respect to gender, only older women were found to experience a lower percentage of unmet needs for outpatient care than their counterparts in the 2019 sample.

**Table 2: Unmet Needs for Inpatient Care in 2019 and 2022,
Stratified by Older Persons' Characteristics**

Characteristics	2019 (n = 625)		2022 (n = 599)	
	Unmet Needs for Inpatient Care (n = 111)		Unmet Needs for Inpatient Care (n = 91)	
	n (%)	p	n (%)	p
Total	111 (17.76%)		91 (15.19%)	
Gender		0.272		0.486
Male	49 (19.84%)		41 (16.40%)	
Female	62 (16.40%)		50 (14.33%)	
Age group		0.013*		0.001**
60–69	37 (15.35%)		14 (8.64%)	
70–79	27 (14.06%)		35 (13.73%)	
80+	47 (24.48%)		42 (23.08%)	
Living arrangement		0.276		0.585
Alone	8 (11.27%)		9 (14.52%)	
With spouse only	20 (16.67%)		14 (11.38%)	
With at least one child	78 (19.75%)		10 (16.13%)	
Others	5 (12.82%)		52 (16.61%)	
Marital status		0.198		0.506
Married	56 (15.95%)		49 (13.84%)	
Widowed	50 (19.38%)		38 (16.98%)	
Others (Single/Separated/Divorced)	5 (31.25%)		4 (20.00%)	
Highest education attainment		0.124		0.125
No schooling/incomplete primary education	63 (19.87%)		47 (16.61%)	
Complete primary	15 (11.28%)		19 (15.45%)	
Complete secondary	28 (17.95%)		20 (11.30%)	
College and above	5 (26.32%)		5 (31.25%)	
Household wealth quartile		0.323		0.205
1st quartile (poorest quartile)	46 (17.76%)		40 (19.05%)	
2nd quartile (second-poorest quartile)	24 (13.87%)		20 (11.30%)	
3rd quartile (second-wealthiest quartile)	27 (21.26%)		21 (14.89%)	
4th quartile (wealthiest quartile)	14 (21.54%)		10 (14.08%)	
Health insurance		0.672		0.052
No	3 (14.29%)		7 (29.17%)	
Yes	108 (17.88%)		84 (14.61%)	
Residence		0.260		0.709
Urban	18 (22.22%)		15 (16.48%)	
Rural	93 (17.10%)		76 (14.96%)	
Social participation		< 0.0001***		< 0.0001***
No	42 (35.59%)		58 (31.52%)	
Yes	69 (13.61%)		33 (7.95%)	
Cognitive impairment		< 0.0001***		< 0.0001***
No	69 (14.05%)		44 (9.48%)	
Yes	42 (31.34%)		47 (34.81%)	
Memory impairment		0.082		< 0.0001***
No	21 (13.21%)		7 (3.98%)	
Yes	90 (19.31%)		84 (19.86%)	

Note: Pearson's chi-square test results. Figures in bold indicate coefficients with statistical significance. *p < 0.05, **p < 0.01, ***p < 0.0001.

Source: Own calculations, using OP and SHI 2019, and VNAS 2022.

**Table 3: Unmet Needs for Outpatient Care in 2019 and 2022,
Stratified by Older Persons' Characteristics**

Characteristics	2019 (n = 2,254)		2022 (n = 2,136)	
	Unmet Needs for Outpatient Care (n = 335)		Unmet Needs for Outpatient Care (n = 258)	
	n (%)	p	n (%)	p
Total	335 (14.86%)		258 (12.08%)	
Gender		0.040*		0.475
Male	150 (16.76%)		110 (12.69%)	
Female	185 (13.61%)		148 (11.66%)	
Age group		0.004**		0.001**
60–69	139 (14.03%)		79 (9.97%)	
70–79	83 (12.50%)		93 (11.25%)	
80+	113 (18.86%)		86 (16.63%)	
Living arrangement		0.345		0.619
Alone	28 (11.86%)		24 (12.50%)	
With spouse only	60 (13.89%)		49 (11.53%)	
With at least one child	224 (15.83%)		34 (14.85%)	
Others	23 (13.45%)		138 (11.91%)	
Marital status		0.735		0.693
Married	193 (14.54%)		148 (11.59%)	
Widowed	125 (15.08%)		99 (12.76%)	
Others (Single/Separated/Divorced)	17 (17.35%)		11 (13.25%)	
Highest education attainment		0.017*		0.026*
No schooling/incomplete primary education	156 (15.19%)		103 (11.38%)	
Complete primary	57 (11.75%)		47 (10.80%)	
Complete secondary	97 (15.25%)		88 (12.50%)	
College and above	25 (23.58%)		20 (21.74%)	
Household wealth quartile		0.396		0.219
1st quartile (poorest quartile)	115 (14.99%)		88 (12.61%)	
2nd quartile (second-poorest quartile)	84 (13.04%)		70 (11.67%)	
3rd quartile (second-wealthiest quartile)	80 (15.78%)		54 (10.19%)	
4th quartile (wealthiest quartile)	55 (16.77%)		46 (14.94%)	
Health insurance		0.412		0.099
No	50 (13.48%)		30 (9.32%)	
Yes	285 (15.14%)		228 (12.57%)	
Residence		0.648		0.222
Urban	58 (15.63%)		56 (13.86%)	
Rural	277 (14.71%)		202 (11.66%)	
Cognitive impairment		< 0.0001***		< 0.0001***
No	249 (12.89%)		173 (9.79%)	
Yes	86 (26.71%)		85 (23.10%)	
Memory impairment		< 0.0001***		< 0.0001***
No	72 (10.11%)		53 (7.75%)	
Yes	263 (17.06%)		205 (14.12%)	

Note: Pearson's chi-square test results. Figures in bold indicate coefficients with statistical significance. *p < 0.05, **p < 0.01, ***p < 0.0001.

Source: Own calculations, using OP and SHI 2019, and VNAS 2022.

3.2 Aggregate and Detailed Decompositions of Changes in Unmet Healthcare Needs among Vietnamese Older Persons between 2019 and 2022

Table 4 presents the results of the Blinder-Oaxaca decomposition. It indicates that there was an insignificant change in the unmet needs for inpatient care between 2019 and 2022. About –143.76% of the unmet needs for inpatient care change was contributed by characteristic effects, while 242.76% of this change was explained by the coefficient effects.

Table 4: Aggregate and Detailed Decompositions of Changes in Unmet Needs for Inpatient Care among Vietnamese Older Persons between 2019 and 2022

Overall Contribution to the Change	Coefficient (S.E.)		Percentage Contribution (%)	
Change in unmet needs for inpatient care	–0.020 (0.040)			
Difference explained due to characteristics	0.029 (0.021)		–142.76	
Difference explained due to coefficients	–0.049 (0.043)		242.76	
Explanatory Variable	Explained Contribution (due to characteristic effects)		Unexplained Contribution (due to coefficient effects)	
	Coefficient	%	Coefficient	%
Gender (Male as reference)				
Female	–0.001	2.10	0.001	–5.16
Age group (60–69 as reference)				
70–79	0.005	–29.19	0.014	–73.85
80+	0.001	–2.41	0.009	–47.81
Living arrangement (Alone as reference)				
With spouse only	–0.001	3.31	–0.013	65.52
With at least one child	0.012	–59.63	–0.039	195.92
Others	–0.011	57.57	–0.001	0.79
Marital status (Married as reference)				
Widowed	–0.001	3.98	–0.011	53.10
Others (Single/Divorced/Separated)	–0.001	0.55	–0.003	13.56
Highest education attainment (No schooling/incomplete primary education as reference)				
Complete primary	–0.001	–0.81	0.006	–29.76
Complete secondary	0.001	–2.95	0.001	–3.75
College and above	–0.001*	4.85	0.002	–12.85
Household wealth quartile (1st quartile – poorest quartile as reference)				
2nd quartile (second-poorest quartile)	0.001	–5.59	–0.004	20.46
3rd quartile (second-wealthiest quartile)	0.001	–4.50	0.002	–11.01
4th quartile (wealthiest quartile)	0.001	–0.21	–0.001	6.46
Health insurance (No as reference)				
Yes	0.003	–16.57	–0.025	126.46
Residence (Urban as reference)				
Rural	–0.001	3.04	0.018	–89.77
Social participation (No as reference)				
Yes	0.02**	–94.89	–0.025	126.35
Cognitive impairment (No as reference)				
Yes	0.002*	–11.92	0.002	–10.93
Memory impairment (No as reference)				
Yes	–0.002*	10.53	0.058	–286.57

Note: Blinder-Oaxaca decomposition analysis results. Figures in bold indicate that coefficients are statistically significant. *p < 0.05, **p < 0.01, ***p < 0.0001; S.E.: denoted standard error.

Source: Own calculations, using OP and SHI 2019, and VNAS 2022.

The highest level of education attainment, social participation, cognitive impairment, and memory impairment significantly contributed to the improvement in the unmet needs for inpatient care. More specifically, the characteristic effects on the improvement of unmet healthcare needs between 2019 and 2022 were mainly attributed to social participation (94.89%) and communication impairment (11.92%). On the other hand, having a college and above educational level (4.85%) and having suffered from memory impairment (10.53%) were factors impeding the improvement in unmet needs for inpatient care between 2019 and 2022.

Table 5: Aggregate and Detailed Decompositions of Changes in Unmet Needs for Outpatient Care among Vietnamese Older Persons between 2019 and 2022

Overall Contribution to the Change	Coefficient (S.E.)		Percentage Contribution (%)	
Change in unmet needs for outpatient care	-0.032** (0.011)			
Difference explained due to characteristics	-0.012 (0.012)		38.98	
Difference explained due to coefficients	-0.019 (0.016)		61.02	
Explanatory Variable	Explained Contribution (due to characteristic effects)		Unexplained Contribution (due to coefficient effects)	
	Coefficient	%	Coefficient	%
Gender (Male as reference)				
Female	-0.001	0.13	0.013	-40.49
Age group (60–69 as reference)				
70–79	0.001	-3.95	0.009	-28.42
80+	0.001	-0.85	0.009	-30.61
Living arrangement (Alone as reference)				
With spouse only	-0.001	0.58	-0.006	19.41
With at least one child	-0.007	23.62	-0.011	33.40
Others	-0.005	17.82	-0.002	7.19
Marital status (Married as reference)				
Widowed	-0.001	0.75	-0.006	19.01
Others (Single/Divorced/Separated)	-0.001	0.08	-0.001	1.91
Highest education attainment (No schooling/incomplete primary education as reference)				
Complete primary	-0.001	0.50	0.006	-19.40
Complete secondary	0.001*	-4.44	0.007	-23.61
College and above	-0.001**	1.52	0.001	-3.63
Household wealth quartile (1st quartile – poorest quartile as reference)				
2nd quartile (second-poorest quartile)	-0.001	0.17	0.006	-19.30
3rd quartile (second-wealthiest quartile)	-0.001	2.24	-0.003	12.16
4th quartile (wealthiest-quartile)	-0.001	0.33	0.003	-9.69
Health insurance (No as reference)				
Yes	-0.001	4.74	0.013	-40.21
Residence (Urban as reference)				
Rural	-0.001	0.08	-0.001	0.35
Cognitive impairment (No as reference)				
Yes	0.002***	-6.62	0.001	-2.75
Memory impairment (No as reference)				
Yes	-0.001**	2.23	0.005	-16.34

Note: Blinder-Oaxaca decomposition analysis results. Figures in bold indicate that coefficients are statistically significant. *p < 0.05, **p < 0.01, ***p < 0.0001; S.E.: denoted standard error.

Source: Own calculations, using OP and SHI 2019, and VNAS 2022.

For outpatient care, there was a significant change in the unmet needs between 2019 and 2022 (Table 5). About 38.98% of the change in unmet needs for outpatient care was contributed by characteristic effects, while 61.02% of this change was explained by coefficient effects. In detailed decomposition results, the highest level of education attainment, and communication and memory impairments contributed significantly

to the improvement in unmet needs for outpatient care. More specifically, having completed secondary level (4.44%) and having suffered from cognitive impairment (6.62%) were factors mainly contributing to the improvement in unmet needs for outpatient care among Vietnamese older persons between 2019 and 2022. On the other hand, having a college and above educational level (1.52%) and having suffered from memory impairment (2.23%) were factors impeding the improvement in unmet needs for outpatient care among Vietnamese older persons between 2019 and 2022.

4. DISCUSSION

Unmet healthcare needs among Vietnamese older persons reported in 2022 accounted for 15.19% of participants (inpatient care) and 12.08% of participants (outpatient care). These results were remarkably higher than that in Malaysia (6.6% for overall assessment) (Shah et al. 2021). On the other hand, the unmet healthcare need levels in Viet Nam were relatively lower than those in the PRC (16.2% for inpatient care) (Junfang et al. 2009) and in the Republic of Korea (17.4% for overall assessment) (Kim et al. 2018).

This study was the first to investigate the changes in unmet healthcare needs among older persons in the pre- and post-COVID-19 periods in Viet Nam, using two nationally representative surveys on older persons. Interestingly, the results indicated an improvement in unmet healthcare needs over the period from 2019 to 2022. The changes were attributable to the characteristic effects of a range of explanatory variables, including the highest education attainment level, social participation, and communication/cognitive and memory impairments.

Social isolation and loneliness problems were commonly found in older persons in the literature, which had severe consequences for health and well-being (Douglas, Georgiou and Westbrook 2016; Dawson 2019). Moreover, older persons who experienced loneliness and social isolation might have found they had limited social contact with others, and this in turn is considered one of several reasons for unmet healthcare needs. For that reason, encouraging older persons to participate in social activities in their place of residence is expected to improve their health and well-being as well as addressing unmet healthcare needs. This study showed that participation in social activities was mainly attributable to improvement in unmet healthcare needs among Vietnamese older persons. This social support effect was also found in previous literature (Stein et al. 2020; Simsek et al. 2021). Increasing opportunities for social activities and cultivating a sense of community can have a profound impact on addressing unmet healthcare needs. This finding highlighted the importance of social support and social cohesion for the development of the healthcare system for older persons. Therefore, policymakers should consider social participation in designing and developing programs and policy interventions for older persons.

Education was considered a protective factor for the comprehensive development of individuals, reflecting how they perceived and interacted with problems in their living environment. Older persons attaining higher education levels was found to have significant effects on unmet healthcare needs in this study as well as in previous literature (Junfang et al. 2009; Choi and Kim 2021; Kim, You, and Shon 2021). Education had a long-term impact on an individual's life course in terms of health literacy and health consciousness, which can be observed among older persons. More particularly, education equips individuals with a wide range of health and healthcare information. Older persons who have completed a higher education level and above are more likely to have higher health literacy skills, make informed

decisions, and voluntarily engage in self-care practices. Furthermore, education promotes health-conscious behaviors and health awareness. Older persons with higher education attainment are more likely to be aware of protecting their health by taking active roles in healthy lifestyles (Grossman 2008; Vu and Giang 2023). If they experience any poor health conditions, these older persons are more likely to recognize and express their healthcare needs. One thing to note is that older persons that have achieved higher education levels can bridge the gap in healthcare through their high confidence and skills to communicate effectively with healthcare professionals. This is a crucial factor in healthcare for older persons as they can express their healthcare needs as well as strictly following their course of treatment.

This study showed that having completed a secondary education level was found to improve unmet healthcare needs, and this finding aligns with the theoretical foundation and practical studies on education. Having completed a college level and above, however, was reported to impede improvement in unmet healthcare. This finding was in contrast to previous literature, but it should be considered with caution as some scenarios might explain this contradiction. First, apart from education, unmet healthcare needs could result from limited financial constraints and unavailability of healthcare services. Although education can empower older individuals to express their healthcare needs and facilitate informed decisions, it fails to stop systemic barriers to healthcare causing unmet healthcare needs. Second, healthcare management requires specialized medical expertise, especially when older persons are more likely to experience comorbidities and utilize multiple medications. Hence, although education can bridge the gap in healthcare, older persons might struggle with unmet healthcare needs if they lack access to appropriate medical professionals, a comprehensive course of treatment, and medical compliance. Third, together with the education factor, multiple socioeconomic factors will help improve the unmet healthcare needs among older persons. In other words, multiple factors are required to address unmet healthcare needs, including poverty and ineffective social care policies. These scenarios imply that programs and policy interventions should be designed with comprehensive approaches to improve unmet healthcare needs among older persons. These scenarios should be highlighted in the policymaking process, especially as the COVID-19 pandemic revealed numerous drawbacks relating to the healthcare system, infrastructure, and economic conditions.

Communication (or cognitive) and memory impairments are common phenomena as part of the process of aging. These functional declines were reported to contribute to unmet healthcare needs among older persons in previous studies (Herr et al. 2014; Hoebel et al. 2017; Kim et al. 2018; Li et al. 2020; Shah et al. 2021). Older persons are more likely to experience ineffective communication with their family members and healthcare professionals in expressing their poor health conditions and healthcare needs. Consequently, they might underreport symptoms, receive inadequate treatments or delayed diagnosis, misunderstand medical instructions, and even fail to receive medical consultation from healthcare professionals. Moreover, older persons with cognitive and memory impairments may have difficulties with medical management by themselves, especially those who have comorbidities. These impairments can generate several challenges for older persons, such as low medical adherence and polypharmacy.

Functional declines are unavoidable consequences of aging that require comprehensive approaches to eliminate the issues of unmet healthcare needs. Possible interventions include i) improved communication strategies for healthcare professionals; ii) support for caregivers; and iii) improved medication management.

First, healthcare facilities should tailor appropriate strategies to improve the communication efficiency between healthcare professionals and older patients. During medical consultations, healthcare professionals should simplify the language used to enhance older patients' understanding about their health conditions and courses of treatment. Moreover, caregivers should be involved in these consultations for better communication.

Second, caregivers play a crucial role in providing care for older persons, especially for those with functional dependence and complex healthcare needs. They are, to some extent, not only the representatives of older persons when communicating with healthcare professionals but also their supporters during medical treatments. Caregivers may be informal care workers (such as family members) or formal/paid care workers (such as maids) who are not professionally trained in aged care. In some cases of severe health conditions (e.g., cognitive and memory impairments), older persons may generate more complex healthcare needs that require support from professional care rather than ordinary care. Hence, it is suggested that continuous education programs (e.g., short-term training) and financial and nonfinancial support be provided to caregivers, which can improve their work performance. This is expected to indirectly reduce the unmet healthcare needs of older persons with functional declines.

Third, medication management for older persons with functional impairments is an important factor as they may have comorbidities, with multiple medication uptake within a single day. They are more likely to take wrong medications or skip medications, which can lead to complications and side effects on older persons' health. It is recommended that healthcare providers simplify medication regimens to minimize the risks of polypharmacy. Moreover, caregivers should strictly remind older persons to improve their medication adherence and thereby reduce the risks of complications and side effects.

Although this study is the first empirical investigation on unmet healthcare needs among Vietnamese older persons using two sources of nationally representative data, it has some limitations. First, this study investigated the social participation aspect as to whether older persons engaged in any social activities. However, it failed to report the effect of the frequency of social participation on unmet healthcare needs. Future research should continue to explore the complex relationship between social activities and healthcare needs in older persons. Second, although the current analyses managed to address the research objectives, some aspects that should be integrated in order to comprehensively reflect the research topic, such as educational factors, should be considered along with other socioeconomic factors like household wealth and the affordability of healthcare services.

5. CONCLUSIONS

Unmet healthcare needs among Vietnamese older persons generally improved between 2019 and 2022. There were four significant factors that contributed to explaining the changes in unmet needs for inpatient and outpatient care: higher education attainment levels, social participation, communication/cognitive impairments, and memory impairments. Future policy interventions targeted at the entire older population and at the vulnerable older population (those who have functional declines) should be designed to eliminate their unmet healthcare needs.

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