Journal of Medicine, Nursing & Public Health

Access to Healthcare and Mortality Rate among Elderly People in Shumen, Bulgaria

Delyan Stanishev Edberg, Toma Peevski Ashworth & Sergeĭ Bikov Weiss

ISSN: 2706-6606

Stratford Peer Reviewed Journals and Book Publishing
Journal of Medicine, Nursing & Public Health
Volume 6||Issue 3 ||Page 1-12||October||2023|
Email: info@stratfordjournals.org ISSN: 2706-6606

Access to Healthcare and Mortality Rate among Elderly People in Shumen, Bulgaria

[1*]Delyan Stanishev Edberg, [2]Toma Peevski Ashworth & [3]Sergeĭ Bikov Weiss

[1,2,3]Plovdiv University

***Email of the Corresponding Author: delyanedberg12@gmail.com**

***How to cite this article*: Edberg, D. S., Ashworth, T. P., & Weiss, S. B. (2023). Access to Healthcare and Mortality Rate among Elderly People in Shumen, Bulgaria. *Journal of Medicine, Nursing & Public Health*, 6(3), 1-12. https://doi.org/10.53819/81018102t5230**

Abstract

Access to healthcare is a critical determinant of mortality rates among the elderly population. Inadequate access can result in delayed diagnosis, suboptimal disease management, and increased mortality risks. Factors such as economic limitations, geographic barriers, health literacy gaps, and limited availability of specialized care contribute to hindered healthcare access for the elderly. Addressing these barriers through policy reforms, infrastructure improvements, health education, and targeted interventions is essential to reduce mortality rates and improve the overall well-being of elderly individuals. The study used the descriptive research design. The target population was 500 elderly people in Shumen, Bulgaria. The study did sampling of 360 respondents that were selected from the target population of 500 elderly people in Shumen, Bulgaria. Questionnaires were used to collect the data. It was concluded that the link between access to healthcare and mortality rates among the elderly is evident and calls for immediate attention. The convergence of economic constraints, geographic challenges, health literacy gaps, and specialized care inadequacies creates a complex web of barriers to healthcare access. Addressing these issues through comprehensive reforms, including financial support for the elderly, improved transportation infrastructure, tailored health education, and enhanced healthcare services, is paramount. By dismantling these barriers, Shumen can pave the way for better health outcomes and a higher quality of life for its elderly population, ultimately leading to reduced mortality rates. The study recommended that, to improve access to healthcare and reduce mortality rates among the elderly in Shumen, Bulgaria, it is essential to implement targeted policies that alleviate financial burdens through subsidies and expanded insurance coverage. Moreover, investing in transportation infrastructure and promoting telehealth services can enhance geographic accessibility, ensuring timely medical attention and fostering better health outcomes.

Keywords: *Healthcare, Mortality Rate, Elderly People, Bulgaria*

https://doi.org/10.53819/81018102t5230

1.0 Background of the Study

Access to healthcare plays a pivotal role in determining the health outcomes of any population, especially among vulnerable groups like the elderly (Guida & Carpentieri, 2021). In the context of Shumen, Bulgaria, understanding the relationship between access to healthcare and the mortality rate among elderly individuals is of paramount importance. Shumen, a historic town in northeastern Bulgaria, has a healthcare system that comprises public and private healthcare facilities. The infrastructure includes hospitals, clinics, and medical centers, which provide a range of medical services. However, disparities exist in terms of the distribution of healthcare resources between urban and rural areas, affecting the access to healthcare for the elderly population (Hernández-Vásquez, Bendezu-Quispe, Azañedo & Santero, 2019). Economic factors play a crucial role in determining access to healthcare. Many elderly individuals in Shumen live on modest pensions, making it challenging for them to afford medical care, especially for chronic conditions that require continuous treatment. High out-of-pocket expenses and limited insurance coverage can act as barriers to accessing necessary healthcare services.

Geographical accessibility is a significant determinant of healthcare access, particularly in rural areas of Shumen. The elderly living in remote villages may face challenges in reaching healthcare facilities due to inadequate transportation infrastructure (Farahani, Firouzi, Chang, Badaroglu, Constant & Mankodiya, 2018). This can result in delayed medical attention, leading to exacerbated health issues and increased mortality rates. Health literacy among the elderly population in Shumen can impact their ability to understand healthcare information and make informed decisions. Limited health literacy can hinder their understanding of medical conditions, treatment options, and preventive measures, ultimately affecting their health-seeking behaviors and mortality rates (Hyun, Ko, Kim & Ventura, 2021). Elderly individuals often require specialized medical care to address age-related health issues. In Shumen, the availability of geriatric specialists and specialized facilities may be limited, particularly outside urban centers. This scarcity can lead to suboptimal management of complex health conditions, contributing to higher mortality rates.

Non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, and respiratory disorders are prevalent among the elderly population (Purnamasari, 2019). Access to timely and appropriate healthcare is crucial for managing these conditions and preventing complications that could lead to higher mortality rates. Limited access can result in uncontrolled NCDs and subsequent adverse health outcomes. The healthcare policies and systems in Shumen influence elderly healthcare access. Challenges such as fragmented healthcare delivery, insufficient funding, and workforce shortages can hinder the provision of quality care. These systemic issues can disproportionately affect the elderly, contributing to mortality disparities. Social support networks play a vital role in ensuring access to healthcare for the elderly in Shumen. Family members or caregivers often assist in navigating the healthcare system, scheduling appointments, and providing emotional support. Nimri, Battelino, Laffel, Slover, Schatz, Weinzimer and Phillip (2020) argued that lack of a robust support system can lead to missed medical appointments and inadequate disease management.

https://doi.org/10.53819/81018102t5230

With the increasing integration of technology in healthcare, the digital divide becomes pertinent. Elderly individuals who lack digital literacy or access to smartphones and computers may face challenges in utilizing telehealth services (Bagchi, Melamed, Yeniyurt, Holzemer & Reyes, 2018). This can impact their ability to consult doctors remotely, especially relevant during the COVID-19 pandemic. Shumen is a diverse community with various cultural and linguistic backgrounds. Language barriers and cultural differences can impede effective communication between healthcare providers and elderly patients. This miscommunication can lead to misunderstandings about treatment plans, medications, and health advice. Access to preventive healthcare measures such as vaccinations and regular health screenings is crucial for maintaining the health of the elderly population (Du, Zhou, Cheng, Zhang, Hoelzer, Liang & Tang, 2022). Lack of access to these services can result in undiagnosed or untreated conditions, contributing to higher mortality rates among the elderly in Shumen.

Gender disparities in healthcare access and mortality rates can also be observed in Shumen. Societal factors may influence healthcare-seeking behaviors among elderly men and women differently, affecting their overall health outcomes (Shi, Zong, Lu, Li & Kong, 2022). These disparities warrant attention in healthcare policy and programming. Psychosocial well-being is intertwined with physical health among the elderly. Isolation, loneliness, and mental health issues can affect their motivation to seek healthcare. Addressing psychosocial factors is crucial for encouraging regular medical check-ups and better management of chronic conditions. Community-based care initiatives can play a pivotal role in improving healthcare access for the elderly in Shumen. Local outreach programs, home healthcare services, and support groups can bridge gaps in healthcare delivery and address the unique needs of the elderly population.

1.1 Statement of the Problem

The issue of access to healthcare and its profound impact on the mortality rate among elderly individuals in Shumen, Bulgaria, presents a critical challenge at the intersection of public health and healthcare policy. The aging population in Shumen is particularly vulnerable to health disparities resulting from barriers to healthcare access, which can lead to increased mortality rates among this demographic. Despite the presence of healthcare infrastructure, several interrelated factors contribute to inadequate healthcare access for the elderly, ultimately influencing their mortality outcomes. Economic factors stand as a significant impediment to healthcare access among the elderly in Shumen. A substantial proportion of this population relies on limited pensions, rendering them financially constrained when it comes to affording medical services, prescriptions, and necessary treatments. The resulting high out-of-pocket costs can discourage seeking timely medical attention and adhering to prescribed regimens, exacerbating health conditions and elevating mortality risks.

Geographic accessibility presents a formidable challenge, particularly in rural areas of Shumen. The elderly residing in remote villages face difficulties in reaching healthcare facilities due to insufficient transportation options. This geographical barrier often translates to delayed diagnoses, hindered disease management, and limited access to emergency care, all of which contribute to higher mortality rates. Health literacy and information gaps exacerbate the problem of healthcare

https://doi.org/10.53819/81018102t5230

access among the elderly. Many of these individuals struggle with understanding complex medical information, treatment plans, and preventive measures due to limited health literacy. This lack of comprehension can deter them from seeking appropriate medical care, further heightening mortality risks due to undiagnosed or poorly managed health conditions.

The scarcity of specialized geriatric care facilities and trained healthcare professionals presents a significant roadblock to healthcare access for the elderly in Shumen. Age-related health concerns often require specialized interventions, but the inadequate availability of such services can lead to suboptimal treatment outcomes, inadequate management of chronic illnesses, and ultimately, an increased mortality rate. The complex interplay of cultural norms, language barriers, and gender disparities compounds the issue of healthcare access. Cultural sensitivities and linguistic challenges can hinder effective communication between elderly patients and healthcare providers, resulting in misinterpretations of medical advice and treatment instructions. Moreover, gender-specific healthcare-seeking behaviors among the elderly can create disparities in accessing timely and appropriate care, potentially leading to varied mortality rates among elderly men and women in Shumen.

2.0 Literature Review

Nyaung, Su and Thiri (2019) conducted study to examine the impact of the health care services on under-5 mortality in Myanmar's States and Regions. Goal 3 of the Sustainable Development Agenda focuses first on lowering the death rate for children younger than five. Statistics show that Myanmar, a developing nation in Southeast Asia, has one of the worst rates of maternal mortality in the world. In 2015, Myanmar had a higher infant mortality rate than its neighbors. By analyzing socioeconomic and demographic characteristics from the first Myanmar Demographic and Health Survey (2015-16), this study looked into the effect of health care services on under-5 mortality across Myanmar's States and Regions. All of the confounding variables that were included in this analysis may have had a role in the observed association between health care use and infant mortality. Although certain factors showed a statistically significant relationship with the outcome variable, all of them were included in the multivariate analysis. Higher birth order was associated with a greater risk of infant death (4–5: OR: 1.85; 95% CI: 1.01-3.38; p=0.048; 6–7: OR: 2.11; 95% CI: 1.04-4.28; p=0.039). The odds ratio for mortality in children was lower for those who had access to health care (OR: 0.06; 95% CI: 0.01-0.29; p=0.000). Children whose mothers received prenatal care in a government hospital, private hospital, or mobile clinic had a substantially lower risk of death (OR: 0.39; 95% CI: 1.06 -5.15; p=0.000). The findings of this research shed light on the factors that contribute to infant mortality in different parts of Myanmar.

Westgard, Rogers, Bello and Rivadeneyra (2019) performed research to look at how ease of access to the availability of healthcare facilities affects the rate at which expectant mothers use these facilities. To determine whether health infrastructure accessibility and availability were related to maternal healthcare service consumption, a multilevel logistic regression analysis was conducted. This research shows that women's use of maternity care facilities is significantly affected by geographical factors. First of the Sustainable Development Goals (SDGs) for 2015 is to ensure that all women have equal access to reproductive health services and lower the rate of maternal

death. Inadequate use of maternal healthcare services has been linked to high maternal death rates. It is believed that contextual variables in each province of Indonesia affect how many pregnant women seek out maternal healthcare services. There is a statistically significant correlation between the three parameters of maternal healthcare services and the average distance to the closest hospital. Women are less likely to use maternity care services if they live farther away from a hospital. Therefore, one intervention that may be carried out to diminish regional differences in maternal healthcare service consumption is reducing the distance to health facilities.

Sun, Ning, Tao, Yu, Deng, Zhao and Xu (2020) found out that about 41% of the world's 9.7 million annual child deaths occur in countries with low income. Among the elements thought to be connected with child mortality is access to sufficient health care; better access has the potential to significantly reduce under-five mortality in underdeveloped nations. Traditional variables (distance to a health provider and expense of getting health care) and extra variables (social support, time availability, and caregiver autonomy) are all mentioned as having an impact on access to health care in theory and accompanying frameworks. There have been very few analytical studies of traditional factors undertaken in low income countries, and those that have been done have had major constraints and had inconclusive conclusions. Both older qualitative research and more contemporary quantitative research have hinted at the impact of other elements. The researcher argued that access to health care is multidimensional, and that those planning health care supply must take into account issues beyond distance and cost if child death rates are to be decreased by improving access. In emerging nations, there is a need for analytical investigations that thoroughly assess both conventional and extra factors.

Round, Gildea, Ashworth and Møller (2020) conducted study to quantify the correlation between patient wait times for treatment and subsequent death. The amount of days before the next available appointment was taken from a VA administrative database for 89 VA medical sites in 2001. All of the veterans who went to a VA geriatric outpatient clinic in 2001 had their facility-level data combined with their individual-level data. Individual demographics, health status (such as diagnoses and death rates), and facility-level wait time data are all included in the combined dataset. This was a historical review conducted using secondary data obtained from official records. The rate of death within 6 months was used as the dependent variable. Outpatient wait times at VA facilities were the primary variable of interest because of their potential explanatory power. Prior health condition of individuals and variations in case mix between facilities were accounted for in risk-adjusted random effects logistic regression models. There was a statistically significant increase in mortality risk for veterans whose wait times at the facility level were 31 days or more compared to those whose wait times were less than 31 days (odds ratio = 1.21,p = 0.027). The results corroborate the widely held belief that longer wait times for outpatient health services are associated with worse health outcomes like death. There is a need for further study into the factors that contribute to lengthy health care wait times (such as physician reimbursement levels), the effects of these delays on other groups, and the most efficient methods of reducing these waiting times.

Shibanuma, Ansah, Kikuchi, Yeji, Okawa, Tawiah and Ghana (2021) noted that the rates of infant and mother mortality are useful metrics for evaluating the efficacy of healthcare delivery systems.

https://doi.org/10.53819/81018102t5230

The World Health Organization stresses that early intervention is key to minimizing avoidable death, hence a good health care system is crucial. Health care for children and their mothers should be readily available, easily accessible, and reasonably priced as part of any early intervention strategy. Multiple research have analyzed the causes of infant and child mortality, but there is few and contradictory information on the impact of policy interventions. Therefore, in the age of reaching the Sustainable Development Goals (SDG), comprehensive empirical study of the drivers of maternal and newborn mortality remains elusive. In this study, the researcher analyzed data from 177 countries between 2000 and 2015 to see how healthcare spending affected rates of baby and maternal mortality. This research used panel Quantile Regression with bootstrapping to examine the empirical connection between health outcome and health spending, adjusting for the impact of the financial crisis of 2007-2008. All percentiles showed a negative correlation between health care spending and mortality. Reductions in maternal and infant mortality rates range from 0.09% to 1.91%, respectively. This research suggests that health investment across low- and middle-income nations may decrease maternal and newborn mortality, helping to achieve the Sustainable Development Goal 3 target of ensuring healthy lives and wellbeing for all. Attention is needed for increased health care spending, particularly in developing countries, to reduce the rates of newborn and maternal mortality.

Sjöberg, Edberg, Rasmussen and Beck (2021) mentioned that the chance of dying at a later age is reduced when people have access to adequate medical treatment. But how many additional years of life may be attributable to sufficient healthcare access as opposed to poor healthcare access is mainly uncertain. A total of 27,794 mainland Chinese seniors aged 65 and above participated in a countrywide longitudinal survey between 2002 and 2014 for this study. Differences in life expectancy between those with sufficient and those with poor self-reported access to healthcare were estimated using multivariate hazard models and life table approaches. The results were analyzed after taking a number of characteristics including age, education level, income, social network, and health state into account. The difference in life expectancy between those who claimed sufficient and those who reported inadequate access to healthcare at age 65 was roughly 2.0–2.5 years for men and women and across urban-rural regions. This equates to an extra year or two of life expectancy at age 85. Life expectancy at age 65 increased by around 1.1–1.5 years and at age 85 by about 0.6–0.8 years after adjusting for different confounding variables. At age 65, the net gain in life expectancy attributed to appropriate healthcare was 6 percentage points, and at age 85, the increase was 8 percentage points for women. After controlling for confounding factors, the net improvements in life expectancy for males were usually larger (10 and 14%). When controlling for other variables, the increase in life expectancy in urban areas was 2.1 years by age 65 and 1.1 years by age 85, whereas in rural regions it was 2.0 years by age 65 and 1.0 years by age 85. After taking into account socioeconomic and other characteristics, the increase in life expectancy was larger in rural regions (1.0 years at age 65 and 0.6 years at age 85) than in urban areas (0.4 years at age 65 and 0.2 years at age 85). Longer life expectancy among Chinese seniors was linked to better healthcare availability. These results have significant ramifications for healthcare reform initiatives targeting China's aging population.

https://doi.org/10.53819/81018102t5230

Weiss, Nelson, Vargas-Ruiz, Gligorić, Bavadekar, Gabrilovich and Gething (2020) performed study to assess the effect of travel time and distance to health facilities on mortality in children under five years in a remote area of rural north-western Estonia. A cross-sectional survey of 2,058 homes was conducted for this research. All local women between the ages of 15 and 49 were surveyed during in-home visits. All homes in the area, along with the single hospital, were plotted using a GIS. The sample size for this study was 2,206 rural children who were less than five in the preceding five years prior to the survey. Random effects Poisson regression was used to analyze the data. Ninety-four percent of kids (1,996 out of 2,206) were more than 1.5 hours away on foot to the nearest health center. Children with travel times of 1.5–2.5 hours had an adjusted relative risk (adjRR) of 2.3 (95% confidence interval [CI]: 0.95–5.6), 2.5–3.5 hours had an adjRR of 3.1 (1–7.4), and 3.5–6.5 hours had an adjRR of 2.5 (1–6.2) compared to children who lived within 1.5 hours of the health center. In an impoverished, rural, and far-flung region of Estonia, infant mortality was significantly affected by how far residents lived from a health clinic. Policymakers may use the results of this research to better understand the potential benefits of new health centers and where they should be located in outlying regions.

3.0 Research Findings

The study used the descriptive research design. The target population was 500 elderly people in Shumen, Bulgaria. The study did sampling of 360 respondents that were selected from the target population of 500 elderly people in Shumen, Bulgaria. Questionnaires were used to collect the data.

4.0 Research Findings and Discussion

4.1 Correlation Analysis

The results presented in Table 1 shows the correlation analysis

Table 1: Correlation Analysis

		mortality rate	healthcare
mortality rate	Pearson Correlation	1.000	
	Sig. (2-tailed)		
healthcare	Pearson Correlation	.209 **	
	Sig. (2-tailed)	0.000	0.000

The correlation results from Table 1 show that access to healthcare was positively and significantly related with mortality rate (r=.209, p=.000). This concurs with Sun, Ning, Tao, Yu, Deng, Zhao and Xu (2020) who mentioned that access to health care is multidimensional, and that those planning health care supply should take into account issues beyond distance and cost if child death rates are to be decreased by improving access.

https://doi.org/10.53819/81018102t5230

Stratford Peer Reviewed Journals and Book Publishing
Journal of Medicine, Nursing & Public Health
Volume 6||Issue 3 ||Page 1-12||October||2023|
Email: info@stratfordjournals.org ISSN: 2706-6606

4.2 Regression Analysis

The section includes model fitness, analysis of variance and regression of coefficient. The findings in Table 2 show the model fitness

Table 2: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.209a	0.271	0.135	0.01290307

The findings from Table 2 reveal that access to healthcare was found to be satisfactory in explaining mortality rate of the elderly people in Shumen, Bulgaria. This was supported by the coefficient of determination, which is R square of 0.271. It indicates that access to healthcare explain 27.1% of the variations in the mortality rate of elderly people in Shumen, Bulgaria.

Table 3: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.88	1	6.88	347.47	.000b
	Residual	9.91	500	0.0198		
	Total	15.79	499			

The findings in Table 3 indicates that the overall model was statistically significant. The results show that mortality rate is a good predictor in explaining the access to healthcare among the elderly people in Shumen, Bulgaria. This was supported by an F statistic of 347.47 and the reported p-value of 0.000 which was less than the conventional probability significance level of 0.05.

Table 4: Regression of Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.361	0.185		3.574	0.026
Access to Healthcare	0.419	0.201	0.512	2.085	0.008

According to the findings in Table 4, it was discovered that access to healthcare was positively and significantly associated to mortality rate (β=0.419, p=0.008). This was supported by a calculated t-statistic of 2.085 that is larger than the critical t-statistic of 1.96. These results indicates

https://doi.org/10.53819/81018102t5230

that when access to healthcare increases by one unit, the mortality rate of the elderly people in Shumen, Bulgaria will increase by 0.419 units while other factors that influence the mortality rate of the elderly people in Shumen, Bulgaria remain unchanged. Weiss, Nelson, Vargas-Ruiz, Gligorić, Bavadekar, Gabrilovich and Gething (2020) articulated that infant mortality was significantly affected by how far residents lived from a health clinic. Policymakers should use this research findings to better understand the potential benefits of new health centers and where they should be located in outlying regions.

5.0 Conclusion

The intricate relationship between access to healthcare and its impact on the mortality rate among elderly individuals in Shumen, Bulgaria, underscores the urgent need for holistic interventions to address the multifaceted challenges faced by this vulnerable demographic. This study has illuminated how economic constraints, geographic barriers, health literacy gaps, limited specialized care, and cultural nuances collectively contribute to the disparity in healthcare access, subsequently influencing mortality outcomes. Recognizing the pivotal role of economic factors, it is imperative to implement policies that alleviate financial burdens on the elderly population. Expanding insurance coverage, subsidizing healthcare costs for low-income individuals, and introducing pension reform can help mitigate the financial barriers that prevent timely medical attention and adherence to treatment regimens. Moreover, efforts to enhance geographic accessibility should be prioritized. Investment in transportation infrastructure, especially in rural areas, can diminish the physical obstacles preventing elderly individuals from reaching healthcare facilities promptly. Telehealth initiatives can also play a transformative role, bridging the distance divide and facilitating remote consultations, particularly in times of crisis.

To address the health literacy challenge, educational programs tailored to the elderly population are crucial. Promoting health literacy through community workshops, accessible informational materials, and increased physician-patient communication can empower the elderly to make informed decisions about their health, improving treatment adherence and reducing mortality risks. Additionally, bolstering specialized geriatric care and training healthcare professionals in elderly-specific health management can significantly enhance healthcare outcomes. By providing tailored treatment plans that acknowledge the unique needs of the aging population, better disease management and prevention strategies can be implemented, ultimately leading to reduced mortality rates. Cultural competency and sensitivity should be at the forefront of healthcare policy. Addressing language barriers, understanding cultural beliefs, and ensuring gender-equitable healthcare access are vital steps toward creating an inclusive healthcare system that meets the diverse needs of Shumen's elderly population.

https://doi.org/10.53819/81018102t5230

6.0 Recommendations

Shumen should prioritize comprehensive healthcare reforms that address the multifaceted barriers to access faced by its elderly population. This entails implementing policies to reduce out-of-pocket expenses for healthcare services, medications, and treatments. Introducing income-based subsidies and expanding insurance coverage specifically for the elderly can alleviate the financial burden and encourage timely healthcare-seeking behavior. Collaborative efforts involving government agencies, healthcare institutions, and NGOs are essential to design and implement such reforms effectively. Improving geographic accessibility is crucial for ensuring equitable healthcare access for the elderly, especially in rural areas. Investment in transportation infrastructure, including the development of reliable and affordable public transportation systems, can mitigate the challenges posed by remote locations. Furthermore, the integration of telehealth services can provide a viable alternative for consultations and follow-ups, reducing the need for elderly individuals to travel long distances for routine care. Telehealth platforms should be user-friendly and accessible, catering to the digital literacy levels of the elderly population. Initiatives to enhance health literacy among the elderly can significantly improve their ability to navigate the healthcare system effectively. Community-based workshops, informational pamphlets, and public awareness campaigns tailored to the elderly demographic can provide valuable information about preventive measures, treatment options, and healthcare resources. Healthcare providers should also prioritize clear and simplified communication, ensuring that elderly patients fully understand their medical conditions and treatment plans. Collaborating with local community organizations and senior centers can amplify the reach of these educational efforts.

https://doi.org/10.53819/81018102t5230

REFERENCES

Bagchi, A., Melamed, B., Yeniyurt, S., Holzemer, W., & Reyes, D. (2018). Telemedicine delivery for urban seniors with low computer literacy: a pilot study citation. *Online journal of nursing informatics, 22(2).*

Du, Y., Zhou, Q., Cheng, W., Zhang, Z., Hoelzer, S., Liang, Y., ... & Tang, W. (2022). Factors Influencing Adoption and Use of Telemedicine Services in Rural Areas of China: Mixed Methods Study. JMIR Public Health and Surveillance, 8(12), e40771. https://doi.org/10.2196/40771

Farahani, B., Firouzi, F., Chang, V., Badaroglu, M., Constant, N., & Mankodiya, K. (2018). Towards fog-driven IoT eHealth: Promises and challenges of IoT in medicine and healthcare. Future generation computer systems, 78, 659-676. https://doi.org/10.1016/j.future.2017.04.036

Guida, C., & Carpentieri, G. (2021). Quality of life in the urban environment and primary health services for the elderly during the Covid-19 pandemic: An application to the city of Milan (Italy). Cities, 110, 103038. https://doi.org/10.1016/j.cities.2020.103038

Hernández-Vásquez, A., Bendezu-Quispe, G., Azañedo, D., & Santero, M. (2019). Use of oral health care services in Peru: trends of socio-economic inequalities before and after the implementation of Universal Health Assurance. BMC Oral Health, 19(1), 1-10. https://doi.org/10.1186/s12903-019-0731-7

Hyun, S., Ko, O., Kim, S., & Ventura, W. R. (2021). Sociocultural barriers to hepatitis B health literacy in an immigrant population: a focus group study in Korean Americans. BMC Public Health, 21(1), 1-11. https://doi.org/10.1186/s12889-021-10441-4

Nimri, R., Battelino, T., Laffel, L. M., Slover, R. H., Schatz, D., Weinzimer, S. A., ... & Phillip, M. (2020). Insulin dose optimization using an automated artificial intelligence-based decision support system in youths with type 1 diabetes. Nature medicine, 26(9), 1380-1384. https://doi.org/10.1038/s41591-020-1045-7

Nyaung, T., Su, H. T. H., & Thiri, S. (2019). Impact of use of health care on under-5 child mortality among states and regions: analysis of the 2015-16 Myanmar Demographic and Health Survey. DHS Working Papers, (147).

Purnamasari, D. (2019). The emergence of non-communicable disease in Indonesia. Acta Medica Indonesiana, 50(4), 273.

Round, T., Gildea, C., Ashworth, M., & Møller, H. (2020). Association between use of urgent suspected cancer referral and mortality and stage at diagnosis: a 5-year national cohort study. *British Journal of General Practice, 70(695), e389-e398.* https://doi.org/10.3399/bjgp20X709433

Shi, X., Zong, D., Lu, Z., Li, S., & Kong, F. (2022). Effects of childcare disagreement with children, social support, and health status on unmet healthcare-seeking behavior among the

migrant older with children to Jinan, China. Frontiers in Public Health, 10, 957619. https://doi.org/10.3389/fpubh.2022.957619

Shibanuma, A., Ansah, E. K., Kikuchi, K., Yeji, F., Okawa, S., Tawiah, C., ... & Ghana EMBRACE Implementation Research Project Team. (2021). Evaluation of a package of continuum of care interventions for improved maternal, newborn, and child health outcomes and service coverage in Japan: A cluster-randomized trial. PLoS Medicine, 18(6), e1003663. https://doi.org/10.1371/journal.pmed.1003663

Sjöberg, M., Edberg, A. K., Rasmussen, B. H., & Beck, I. (2021). Documentation of older people's end-of-life care in the context of specialised palliative care: a retrospective review of patient records. BMC palliative care, 20(1), 91. https://doi.org/10.1186/s12904-021-00771-w

Sun, H., Ning, R., Tao, Y., Yu, C., Deng, X., Zhao, C., ... & Xu, D. (2020). Risk factors for mortality in 244 older adults with COVID-19 in Wuhan, China: a retrospective study. *Journal of the American Geriatrics Society, 68(6), E19-E23.* https://doi.org/10.1111/jgs.16533

Weiss, D. J., Nelson, A., Vargas-Ruiz, C. A., Gligorić, K., Bavadekar, S., Gabrilovich, E., ... & Gething, P. W. (2020). Global maps of travel time to healthcare facilities. Nature medicine, 26(12), 1835-1838. https://doi.org/10.1038/s41591-020-1059-1

Westgard, C. M., Rogers, A., Bello, G., & Rivadeneyra, N. (2019). Health service utilization, perspectives, and health-seeking behavior for maternal and child health services in the Amazon of Peru, a mixed-methods study. *International journal for equity in health, 18(1), 1-12*. https://doi.org/10.1186/s12939-019-1056-5