Akdeniz Hemşirelik Dergisi
Akdeniz Nursing Journal

RESEARCH ARTICLE
Araştırma Makalesi

The Effect of Social Determinants of Health on Life Expectancy: A Retrospective Study

Sağlığın Sosyal Belirleyicilerinin Yaşam Beklentisine Etkisi: Retrospektif Bir Çalışma

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Bu makalede yapılacak atıf
Cite this article as

Özsaban A., Uslu E., Bayram A.
The Effect of Social Determinants of Health on Life Expectancy: A Retrospective Study

Akd Hemşirelik D 2024; 3(2): 44-51

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Geliş tarihi / *Received* : April 02, 2024

Kabul Tarihi / *Accepted* : July 24, 2024

ABSTRACT

Aim

This study aimed to examine the effect of social determinants of health on life expectancy.

Method

The retrospective descriptive study data consisted of the life expectancy and social determinants of health secondary data from the Organization for Economic Co-operation and Development the Better Life Index database. The database was screened in January 2022. Pearson correlation analysis was used to determine the level of relationship between variables. Linear regression analysis using the backward elimination method was performed on social determinants of health affecting life expectancy. Reporting is consistent with the STROBE checklist.

Results

The average life expectancy level of the countries is 80.03±4.54. According to the backward elimination method, a one-unit increase in job, health, safety and community levels affects life expectancy by 0.379, 0.486, 0.387, and -0.358 units, respectively ($p<0.05$).

Conclusion

Job, health, safety, and community affected life expectancy. To promote sustainable global health, it is recommended that nurses focus on the social determinants of health at the global level in the care of individuals and community. The ideal of global health provides opportunities for justice and equitable health thought and action and provides a framework for policy development. Nurses must take an active role in guiding policy as advocates for global health.

Keywords

Life expectancy, nursing, OECD, social determinants of health

DOI 10.59398 / ahd.1463207

ÖZET

Amaç

Bu çalışmanın amacı sağlığın sosyal belirleyicilerinin yaşam beklentisi üzerindeki etkisini incelemektir.

Yöntem

Retrospektif tanımlayıcı türdeki bu çalışmanın verileri, Ekonomik İşbirliği ve Kalkınma Örgütü (OECD) 'nün Daha İyi Yaşam Endeksi veri tabanından alınan yaşam beklentisi ve sağlığın sosyal belirleyicileri ikincil verilerinden oluşmaktadır. Veri tabanı Ocak 2022'de taranmıştır. Değişkenler arasındaki ilişkinin düzeyini belirlemek için Pearson korelasyon analizi kullanılmıştır. Yaşam beklentisini etkileyen sağlığın sosyal belirleyicilerine geriye doğru eleme yöntemi kullanılarak doğrusal regresyon analizi uygulanmıştır. Raporlamada STROBE kontrol listesinden yararlanılmıştır.

Bulgular

Ülkelerin ortalama yaşam beklentisi düzeyleri 80,03±4,54'tür. Geriye doğru eleme yöntemine göre iş, sağlık, güvenlik ve toplum düzeyindeki bir birimlik artış, yaşam beklentisini sırasıyla 0,379, 0,486, 0,387 ve -0,358 birim etkilemektedir ($p<0,05$).

Sonuç

İş, sağlık, güvenlik ve toplum yaşam beklentisini etkilemektedir. Sürdürülebilir küresel sağlığı teşvik etmek için birey ve toplumun bakımında küresel düzeyde hemşirelerin sağlığın sosyal belirleyicilerine odaklanması önerilmektedir. Küresel sağlık ideali, adil ve eşitlikçi sağlık düşüncesi ve eylemi için fırsatlar ve politika geliştirme için bir çerçeve sağlar. Hemşireler küresel sağlığın savunucuları olarak politikaları yönlendirmede aktif bir rol üstlenmelidir.

Anahtar kelimeler

Hemşirelik, OECD, sağlığın sosyal belirleyicileri, yaşam beklentisi

What is known about the field

- Social determinants of health are non-medical factors that affect health outcomes.

Contribution of the article to the field

- Job, health, safety, and community affected life expectancy.
- Nurses and other health professionals must take an active role in guiding policy as advocates for global health.

INTRODUCTION

Life expectancy (LE) is a key indicator of health status and has increased globally over time as a result of the advances in the quality of health services (1). LE increases in parallel with the expansion of health services but the progress is slowing down in OECD countries and there is even a decrease in some countries (2). The relationship between social determinants of health (SDH) and LE is particularly emphasized in the attempts to explain these data (3).

SDH is a non-medical factor that affects health outcomes. SDH includes income and social protection, education, unemployment and job insecurity, working life conditions, food insecurity, housing, basic amenities and the environment, early childhood development, social inclusion and non-discrimination, structural conflict and access to affordable health services of decent quality (4). These factors are obviously multifaceted.

SDH has been shown to be associated with 30-55% of health outcomes (4). Previous research results also indicate a higher incidence of chronic diseases and cancer in individuals with lower socioeconomic status (4). Besides, it is those who are already vulnerable that are most likely to suffer, and need help the most in a crisis situation (5). During the COVID-19 pandemic, the infection and mortality rates were higher in the socio-economically weaker groups (6). There is a LE difference of 18 years between low- and high-income countries. These results demonstrate that appropriate handling of SDH is essential to reducing long-standing inequalities in health.Many local and global organizations monitor SDH. One of these organizations is the Organization for Economic Co-operation and Development (OECD). It is an international organization established to develop better policies for a better life. It pursues activities for prosperity, equality, opportunity and well-being for all. OECD undertakes and reports activities aimed at monitoring the health indicators of member countries, creating policies and strengthening services. Through the well-being conceptual framework it has created, the Better Life Index (BLI) published since 2011 offers a multifaceted evaluation opportunity by considering the economic and social indicators of the countries together. BLI provides data on 11 indicators, including housing, income, job, community, education, environment, civic engagement, health, life satisfaction, safety, and work-life balance (7). The World Health Organization's (WHO) definition of health also emphasizes the importance of this requirement. So much so that WHO has underlined that the impact of these determinants on health may be more consequential than health services or lifestyle choices (6).

It is a global problem that the ideal of protecting and maintaining human health cannot be fully reflected in health services (8). However, it is mentioned that approximately three million premature deaths are preventable with a qualified healthcare service (2).

Health promotion practices and qualified nursing care services are thus becoming a fundamental need to increase LE (9). However, there has only been one study to examine the role of nurses in promoting LE (1). Yet, these studies can guide nurses about priority interventions and policies that need to be planned to increase LE (10). Thus, this study aims to examine the effect of SDH on LE. Accordingly, the research hypothesis was "H1: SDH affect LE".

METHODS

Study Design

This is a retrospective descriptive design study. Reporting is consistent with the STROBE checklist.

Participants

Analyses for this research covered the OECD countries and the sample included 37 OECD and four partner countries (N=41). The inclusion criterion of the study was "countries with data on the relevant variable." The exclusion criterion was "countries with no data on the relevant variable." There was, however, no country meeting the exclusion criteria.

Data Collection

This research was conducted using secondary data from the OECD BLI database (11). The database used during the study was scanned in January 2022. The LE and SDH secondary data of the OECD countries included in the study belong to 2020.

Data Collection Tool

The contents of the BLI indicators were calculated as rate, average score, year, percentage, usd, hours and these data were used to score the indicators between 0-10. In this direction, countries in the OECD BLI are evaluated between a score ranging from 0 to 10, out of 11 indicators specified within the scope of independent variables. A high score is considered positive. The contents of each indicator are as follows; (i) housing indicator; dwellings without basic facilities, housing expenditure, rooms per person, (ii) income indicator; household net adjusted disposable income and household net wealth, (iii) jobs indicator; labour market insecurity, employment rate, long-term unemployment rate, personal earnings (iv) community; quality of support network, (v) education; educational attainment, student skills, years in education, (vi) environment; air pollution, water quality, (vii) civic engagement; stakeholder engagement for developing regulations, voter turnout, (viii) health; self-reported health, life expectancy, (ix) life satisfaction; life satisfaction, (x) safety; feeling safe walking alone at night, homicide rate, (xi) work-life balance; employees working very long hours, time devoted to leisure and personal care. The content of the 11 indicators is provided in Table 1 in detail. These 11 indicators are also consistent with the "SDH" defined by WHO (4).

Table 1. Better Life Index Indicators (11)

Indicators	Definition	Content
Housing	Your housing conditions and spending	Dwellings without basic facilities (%) Housing expenditure (%) Rooms per person (ratio)
Income	Household income and financial wealth	Household net adjusted disposable income (usd) Household net wealth (usd)
Jobs	Earnings, job security, and unemployment	Labour market insecurity (%) Employment rate (%) Long-term unemployment rate (%) Personal earnings (usd)
Community	Quality of social support network	Quality of support network (%)
Education	Your education and what he/she gets out of it	Educational attainment (%) Student skills (Average score) Years in education (Years)
Environment	Quality of environment	Air pollution (Micrograms per cubic metre) Water quality (%)
Civic engagement	Your involvement in democracy	Stakeholder engagement for developing regulations (Average score) Voter turnout (%)
Health	How healthy you are	Self-reported health (%) Life expectancy (Year)
Life Satisfaction	How happy you are	Life satisfaction (Average score)
Safety	Murder and assault rates	Feeling safe walking alone at night (%) Homicide rate (Ratio)
Work-Life Balance	How much you work, how much you play	Employees working very long hours (%) Time devoted to leisure and personal care (Hours)

Ethical Considerations

Ethical approval was not required for this study because the data were on open access. However, the Internet Research Ethics Guide were considered in the analysis and reporting of the study (12).

Data Analysis

R version 2.15.3 program was used for statistical analyses. Minimum, maximum, mean, standard deviation and median values were used to report study data. Pearson correlation analysis was used to determine the level of relationship between variables. Multiple linear regression analysis was used in data analysis within the scope of this study because there is a correlation and linear relationship between the variables, the dependent and independent variables are continuous variables, and the data show normal distribution. Statistical significance was accepted as $p<0.05$.

RESULTS

The LE levels of the countries vary between 57.5 and 84.1, with an average of 80.03±4.54. The mean values of SDH and correlation with LE are presented. (Table 2). Significant relationships were found between LE values and housing ($r=0.626$, $p<0.001$), income ($r=0.529$, $p=0.001$), jobs ($r=0.675$, $p<0.001$), education ($r=0.524$, $p=0.001$), environment ($r=0.411$, $p=0.012$), health ($r=0.633$, $p<0.001$), life satisfaction ($r=0.503$, $p=0.001$) and safety ($r=0.668$, $p<0.001$).

All SDH were included as independent variables in the linear regression analysis to determine the factors affecting LE. The model obtained from the analysis with the backward elimination method was found to be statistically significant ($F=21,061$, $R2adj=0.690$, $p<0.001$). Jobs, community, health and safety were significant in the model (Table 3). One unit increase in jobs, health and safety levels increased LE value by 0.379 ($p=0.006$), 0.486 ($p<0.001$) and 0.387 units ($p=0.003$), respectively. We determined that a one-unit increase in the community level caused a 0.358 unit decrease in the LE value ($p=0.005$).

Table 2. Descriptive Results and the Correlation Between Life Expectancy and Social Determinants of Health

	Min-Max (Median)	Mean±SD	LE	
LE	57.5-84.1 (81.5)	80.03±4.54	r	p
Housing	2.5-8.5 (6.2)	5.89±1.36	0.626	**<0.001**
Income	0.3-9.1 (3.15)	3.39±2.21	0.529	**0.001**
Jobs	0-9.9 (7.15)	6.78±1.88	0.675	**<0.001**
Community	0-10 (6.35)	6.06±2.21	0.270	0.106
Education	1.1-8.9 (6.95)	6.28±1.96	0.524	**0.001**
Environment	2.4-10 (6.35)	6.07±2.08	0.411	**0.012**
Civic engagement	1-8.9 (5.85)	5.33±1.91	0.124	0.464
Health	3.1-9.6 (7.75)	7.25±1.68	0.633	**<0.001**
Life Satisfaction	0-10 (6.05)	6.10±2.65	0.503	**0.001**
Safety	0-10 (7.9)	7.39±2.32	0.668	**<0.001**
Work-Life Balance	0.9-9.5 (7.35)	6.84±2.05	0.253	0.131

r= Pearson correlation coefficient.

Table 3. Linear Regression Analysis of Factors Affecting Life Expectancy

	β	Std. β	t	p	95% CI for β		F	Model (p)	R^2	R^2 adj
					Lower bound	Upper bound				
Constant	62.379	-	28.984	<0.001*	57.995	66.763				
Jobs	0.892	0.379	2.967	0.006*	0.280	1.505				
Community	-0.725	-0.358	-3.020	0.005*	-1.214	-0.236	21,061	**<0.001**	0.725	0.690
Health	1.408	0.486	4.161	<0.001*	0.719	2.097				
Safety	0.742	0.387	3.181	0.003*	0.267	1.217				

β: Beta, CI: Confidence Interval, R^2 adj: R^2 adjusted, Std. β: Standardized Beta.

DISCUSSION

LE is the most widely used measure of health status (13). It provides guiding evidence for examining the effect of SDH on LE and drawing attention to the role and responsibilities of nurses in promoting global health. The impact of SDH on LE, a sub-indicator of the health dimension, was examined in this study. The fact that the model established in this study explains 72.5% of LE is essential in explaining the strong link between SDH and health indicators reported in the literature (3-5).

LE is also recognized as one of the key health indicators (13). The results obtained indicate that the average LE for OECD countries is 80.03 years. However, when analysed by countries, it is remarkable that there is a 27-year difference between the countries with the longest and shortest LE (4,13). This striking difference in LE in OECD countries provided the groundwork for examining and discussing its causes. Job is an indicator (OECD) based on the analysis of multifaceted data such as income status, job security and unemployment. A job is a way of providing the material resources an individual needs to survive. It is therefore also the determinant of all the conditions necessary for living a healthy life (OECD). Economic power affects access to healthcare (14,15). Having a good job and income increases the level of well-being, prolongs LE and supports positive health outcomes (15,16). Indeed, the job was determined in this study as a predictor for LE, supporting the meta-analysis that demonstrated a higher risk of mortality in unemployed individuals. Several factors such as risky health behaviours, stress, and low participation in health screenings were reported to be effective in the unemployed (17).

Health is one of the most basic factors in determining the quality of life (18). BLI describes this indicator with two data, namely the individual's self-reported health status and LE. LE (years) is usually an assumption that directly reflects the conditions of death associated with the health indicator in a given period (13). Cultural and several other factors can influence responses to self-reported health status (OECD). This study has shown that self-reported health status contributed positively to the connection between the health indicator and LE and that individual perceptions could be used as an important data source in reflecting the actual situation. Similarly, previous studies have reported that individuals with health problems had a low quality of life and therefore LE levels were lower than in individuals without health problems (19), demonstrating that the health indicator is important in explaining LE.
The safety indicator is based on the analysis of data on the feeling of safety when walking alone at night and homicide rates (OECD). It is an inalienable element in determining the quality of life, both at the individual and societal levels (18). Personal safety is considered the guarantee of living in a safe environment and the existence of people together with a higher quality of life. The crime rate in the regions where people live has a decisive effect on the quality of life (13,18). An unsafe environment leads to poor physical and mental health outcomes (14). People can only meet their vital needs in a safe environment (18). Nar examined the relationship between safety and health (18). This study established the relationship between LE and the health indicator of safety.

Community is an indicator of the quality of a social support network (11), which refers to a social structure that includes broader social ties as well as close personal relationships and social interactions (20). In this study, it was seen that the Community indicator had a negative effect on the LE score. This was the most notable finding of the study. In comparison, studies in the literature report that social networks contribute to physical health and mental well-being (21), and that social isolation affects morbidity and mortality in many ways, including psychological, behavioural, interpersonal and physiological (22-23). On the other hand, individuals with weak social support networks cannot benefit from economic opportunities, experience communication deficiencies and isolate their emotions, thus experiencing family and job loss, financial and health problems, becoming individuals who do not contribute to society and cannot meet their personal needs (13). However, an improvement in SDH does not necessarily represent absolute well-being (for example, an improvement in income status may not be an indicator of better health). This is explained by the fact that SDH is influenced by numerous other factors such as social, economic, psychological, environmental, genetic and epigenetic, and it is stated that exceptional results are feasible (24). In this context, this remarkable finding of the study can be explained as an exceptional situation. However, it points to the necessity of planning studies on the subject.

This study demonstrated that the SDHs of housing, income, education, environment, civic engagement, life satisfaction and work-life balance did not affect LE. However, it is known that the SDHs are closely related to each other. When evaluated from this point of view, 5 of 11 indicators in BLI involved economic factors. The latter forms the basis of inequality in health (25). Inequality in health, on the other hand, is also known to be affected by social and social structures. It is thus important to fully consider SDHs to be able to eliminate such inequalities. From this point of view, the need for health professionals to focus on all components of health, as well as the practice of providing a disease-oriented health service, arises. Awareness-raising and restructuring are recommended for a healthcare system approach focusing on the SDH (23).

Implications for Practice

Healthcare professionals go through intensive training in the field of medicine and medical care is undeniably important. On the other hand, the fact that SDH plays

a vital role in shaping health has only been studied to a limited extent (24). Healthcare professionals can strengthen routine procedures to assess and respond to social needs through social and legal services.
Political and economic factors that form the basis of inequality are decisive in how global health takes shape (26). Healthcare professionals should therefore focus on strengthening services with the understanding of providing equal health care to every member of society, based on ethical principles and values, in their every practice (27). Healthy communities can only be created with a health philosophy that integrates the biological, behavioural and social determinants of health (28). For this, the key attitude in the organization of health services should be to provide the best health service for everyone and to protect life under all circumstances. Article 25 of the Universal Declaration of Human Rights includes the right to health within the framework of the right to life, by stating that "Everyone has the right to food, clothing, housing and medical care for the health and well-being of themselves and their families" (29). In the ideal of achieving the goal of equality in health for all nations and all peoples, nurses should contribute as advocates and healers and relievers through caregiving (30). Hence, they are expected to be a pioneer in strategies and policies for an equitable and effective health system that provides free access to quality health services in raising the LE of the population.

Health services should be based on human dignity, subjectivity and free will within the framework of an individualized approach (31). This is because humans are multifaceted beings, and health and disease processes are affected by various variables. From this perspective, the basic principle of nursing practice is expressed as respect for all individuals' innate human rights, uniqueness and worthiness (32). This understanding is adopted as the value of "human dignity" in nursing. The American Association of Colleges of Nursing (AACN) has defined this value as "respect for the inherent worth and uniqueness of individuals and societies" (33). It also encompasses person-centredness, integrity, privacy and confidentiality (33). These are reflected in nurses' relations in all kinds of practice settings. They also support nurses' leading role in developing and modifying health policies (32). Focusing on the SDH is a requirement of the holistic nursing approach (14). The nursing ethics code determined by the ANA, "Nurses should perform their practices by showing compassion in all their professional relationships, taking into account the human dignity, uniqueness and value of each individual, the nature of social, economic, individual characteristics or health problems" also imposes an important responsibility on nurses in this regard (32). With its belief in social justice and a holistic view of well-being, health and illness, nursing is in an excellent position to act on the SDH's structural, systemic and social components (15). To promote sustainable global health, global nursing calls for consideration of the SDH and care for the individual and the community. This care includes research, education, leadership, advocacy, and policy-making initiatives (35). It also requires a change in social issues, value sharing, focusing on innovation, empowering the individual/society, attempts to change the health system, orientation to vulnerable/susceptible groups, participatory/people-centred planning, creative collaborations and multi-sectoral solutions for the improvement of global health (35). The ideal of global health provides opportunities for more collective, equitable health thought and action and provides a framework for policy development (26). Nurses and other health professionals must take an active role in guiding policy as advocates for global health.

Limitations

This study has some limitations. The first is that the analysed data is limited to OECD countries only. The second is that it included data from a certain period. Therefore, different results can be obtained in analyses performed at different time intervals. Also, the study was not powered to demonstrate the variables that may mediate the relationship between LE and SDH, which was another limitation. Therefore, if countries are scored based on potential mediating variables in future studies, we recommend including this in the analysis process.

CONCLUSION

In this study, the job, community, health, life satisfaction and safety indicators significantly affected LE. To determine the reproducibility of the results obtained from this study, we recommend analysing the data of the following years and discussing in future studies the effects on the LE of the indicators whose effects were not studied.

Author Contribution
Conceptualization: AÖ, EU, AB; Design: AÖ, EU, AB; Counselling: AÖ, EU, AB; Data Gathering/Processing: AÖ, EU, AB; Analysis/Interpration: AÖ, EU, AB; Literature Review: AÖ, EU, AB; Writing: AÖ, EU, AB; Critical Review: AÖ, EU, AB

Conflict of Interest
There is no any conflict of interest.

Funding Statement
The authors declared that this study has received no financial support.

Ethical Issues
Ethics committee approval is not required for this study.

This study was presented at the 8th International Health Sciences and Management Conference. Trabzon/Türkiye on 2-6 May 2023.

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