Macedonian pharmaceutical bulletin, **66** (1) 79 - 84 (2020)
ISSN:
UDC: 615.015.38:612.013(497-15)
DOI: 10.33320/maced.pharm.bull.2020.66.01.009
Professional paper

Life expectancy's relationship with behavioral factors and polypharmacy in Western Balkan countries

Arben Boshnjaku[1,2 *], Ermira Krasniqi[2]

[1]*Faculty of Medicine, University of Gjakova "Fehmi Agani", Ismail Qemali, n.n., 5000 Gjakova, Kosovo*
[2]*College of Medical Sciences Rezonanca, Blloku te Shelgjet – Veternik, 10000 Prishtina, Kosovo*

Received: April 2020; Accepted: April 2020

Abstract

Ageing is a multidisciplinary studied process characterized with a gradual increased time of homeostasis and decreased time of reaction and performance. Expected life expectancy is an important measure of a populations' health status and healthcare system's performance, which is characterized with a gradual increase in the modern world. This increasing trend changes between different countries and societies, while being affected by several internal, external and behavioral factors.

This narrative review analyses and compares the countries of Western Balkans, all of whom classified as middle income countries.

Increasing physical activity, avoiding smoking as well as decreasing overweight and obesity present reliable mechanisms to invest in terms of providing a better lifestyle and quality of life. Polypharmacy presents another integral player into this process, which affects and interacts with each and every other factor. Altogether should be taken in consideration in policy makings, healthcare approaches and intervention plans.

Keywords: life expectancy, polypharmacy, western Balkan, overweight, obesity

Abbreviations

BMI – Body Mass Index, EU – European Union, GHO – Global Health Observatory, OECD - Organization for Economic Co-operation and Development, WHO – World Health Organization

Introduction

Ageing is a multidisciplinary studied process and phenomenon that starts from conception and continues throughout the life span, until the final moments of life, culminating with death. In the eyes of natural sciences, the ageing process follows several stages which culminate with senescence. The social sciences see ageing as a phenomenon (besides as a process) that undergoes certain psycho-social evolution and challenges.

Homeostasis is one of the core processes enabling and assuring a decent contingency into the ageing process. An increase in time for equilibration is observed with ageing, which is mainly due to a number of different factors, gradually resulting in the decrease of the quality of life through the increase of prevalence of functional impairment, chronic diseases and mortality (Taylor et al., 2008).

Ageing (considering within the senescence period) is characterized by a tendency to increase body weight, fat content (including the redistribution from periphery towards center), and decrease of height, fat free mass (including muscle and bone mass) and physical activity (Kenney et al., 2012). There are two types of ageing: eugeric (true ageing / age-related changes) and pathogeric

* arbenboshnjaku@gmail.com

(pathological ageing / ageing process affected by external factors such as: environmental, genetic mutations and accidents) (Taylor et al., 2008).

Life expectancy at birth represents the average age at death if everyone experienced the prevailing death rates throughout their lifetime (Aburto et al., 2018), while being one of the most commonly used measures of the health status of a population and the performance of the healthcare system (WHO, 2016). In fact, it has been shown that a nation's life expectancy reflects its social and economic conditions and the quality of its public health and healthcare infrastructure (health spending per capita), whereas monumental improvements in life expectancy have been the predominant trend for high income, developed countries over the course of the 20th and 21st centuries (Bongaarts, 2006; Wilmoth, 2000). At the moment, worldwide expected life expectancy at birth is 72.4 years, out of which 70.2 in males and 74.7 in females (Worldbank, 2017). This number changes in different countries or populations due to several factors, starting from the quality and approach to healthcare system, morbidity, polypharmacy, level of education, genetic background, counties level of development and socio-economic aspects. Countries level of development unarguably presents an important factor on this matter, especially having in mind that many of the other factors are either directly or indirectly related to it. Therefore, notwithstanding the lack of a clear definition for developing countries, the common understanding is that these are countries generally characterized by low per capita income, an unequal distribution of resources, inadequate health care, bad education opportunities and high unemployment rate. Western Balkans is an encompassing name for a sub-region in Europe, formed by Albania, Bosnia and Herzegovina, North Macedonia, Montenegro, Serbia and Kosovo. According to the Organization for Economic Co-operation and Development (OECD) list of European developing countries only Kosovo is classified as being part of the Lower Middle Income Countries, whereas all the others belong to the Upper Middle Income Countries. The classification threshold lies upon per capita gross national income (GNI) of $1 006 - $3 955, in comparison to GNI $3 956 - $12 235 in upper middle income countries and ≤ $1 005 in 2016 in low income countries (OECD, 2020).

Based on the upon mentioned facts, this narrative review aims to: (1) compare the expected life expectancy between the countries in the Western Balkan region, (2) analyze the impact of different covariates in the current state of art, (3) analyze the polypharmacy and its relation to morbidity in these populations.

Expected life expectancy in Western Balkans vs. EU-countries

The expected life expectancy in European Union (EU) is much higher than the world average (EU: 80.9 years in total, 78.4 in males and 83.8 in females, world: 72.4 years, out of which 70.2 in males and 74.7 in females) (Worldbank, 2017). These differences are seen mainly due to the countries level of development, which encompasses the generally better education, healthcare and social systems, altogether providing a better quality of life, lower morbidity and mortality. To this day, differences between lower and middle income countries vary between 68.3 years (66.7 in males and 70.1 in females) and 75.5 years (72.9 in males and 78.3 in females), respectively (Worldbank, 2017). Therefore, it is obvious that Kosovo as the only officially classified country in the lower group (within the studied countries) should have a lower expected life expectancy. Yet, this is not the case since Serbia (75.9 years in total, 73.5 in males, 78.4 in females) (Eurostat, 2020) presents a relatively lower life expectancy than Kosovo (76.7 years in total, 74.1 in males, 79.4 in females) (2011, Census), whereas North Macedonia (76.7 years in total, 74.6 in males, 78.8 in females) presents a relatively similar case. Montenegro is to some extent better (76.9 years in total, 74.5 in males, 79.3 in females), whereas Albania has the highest expected life expectancy in the region (78.9 years in total, 77.4 in males, 80.5 in females) (Eurostat, 2020). For comparison, developed European countries such as: Germany (81.0 in total, 78.6 in males and 83.3 in females), Austria (81.8 in total, 79.4 in males and 84.1 in females), Italy (83.4 in total, 81.2 in males and in 85.6 females) or France (82.9 in total, 79.7 in males and 85.9 in females) present a much higher expected life expectancy, even though these data could be changed in the wake of the aftermath of Covid 19 pandemics which undoubtedly presents a potentially demographical changing factor. It must be stated that there is a positive aspect in the studies data, which is the fact that these date are undergoing a constant increase in all the cases. This undoubtedly serves as a good indicator on the increase of the quality of life, as well as opportunities towards better service and goods.

The other interesting findings from these data are that excluding Serbia (19.4%), the number of older adults in this region (Montenegro: 14.4%, North Macedonia: 13.3%, Albania 13.1% and Kosovo: 8.1%) is lower than the EU's (19.4%), with North Macedonia leading in the transitional group 15 – 64 years (70.2%), followed by Albania (68.7%), Montenegro (67.4 %), Kosovo (68.8%) and Serbia (66.3%) (Eurostat, 2020). This is an aspect to be taken in serious consideration since with the increase of life expectancy comes the increase of the number of older populations. Thereafter, this leads to extra economic, psycho-social and healthcare burdens.

Impact of behavioral factors on life expectancy

It has been described that the life expectancy increases with time within a wide variation between different populations, all based on health spending per

capita and behavioral factors such as smoking and caloric intake (Zare et al., 2015). All the countries of this region (Western Balkans) are characterized for either undergoing of having gone through a transition period from a centralized governing system in the past, towards a rather decentralized democracy with competitive capitalist approach. This transition period led to the foundation of many private based healthcare providing competitors. Due to a combination of many factors, beginning from the lower number of elderly population, lack of adequate policies and profit oriented offer, the older generation and health spending on them might have been neglected.

Behavioral factors such as physical activity, smoking, overweight and obesity could also play their part. Unfortunately, there seem to be a general lack of data with respect to the behavioral habits of the elderly in western Balkan countries, with an emerging need for future studies on these fields. With respect to the physical activity level, we can only assume that it should be lower to other European countries, mainly due to the lack of organized infrastructure. This should be important especially knowing the fact that with ageing, comorbidities and impairments increase. This often leads to the bounding of physical activities to restricted paths and fields with extra caution.

Smoking is another factor described to strongly amplify the risk for mortality (Mons et al., 2015; Qin et al., 2013), which is presented in quite high prevalence within the studied countries. Smoking prevalence varies from 51.2% in males and 7.6% in females in Albania, 47.2% in males and 30% in females in Bosnia and Herzegovina, 43.6% in males and 39.7% in females in Serbia (WHO, 2015), 46.7% in males and 27.8% in females in North Macedonia (Tobacco control fact sheet, 2016), 47.9% in males and 44.0% in females in Montenegro (Worldbank, 2016) to 37.4% in males and 19.7% in females in Kosovo (Gashi et al., 2017). The importance of smoking consumption and its effect on health is observed especially when comparing with the European countries with higher life expectancy such as: Germany (32.4% in males and 28.3% in females), Italy (28.3% in males and 19.7% in females), France (29.8% in males and 25.6% in females) (WHO, 2015).

Last (but certainly not least), there are overweight and obesity as an ever-growing concern for public health. 39% of adults aged 18 years and over (39% of men and 40% of women) were classified as overweight by 2016 (officially defined as "abnormal or excessive fat accumulation that may impair health"), whereas this prevalence nearly tripled between 1975 and 2016; additionally, higher body mass index (BMI) is acknowledged as a major risk factor for non-communicable diseases such as: cardiovascular diseases, diabetes, musculoskeletal disorders and some cancers (WHO, 2020). Overweight and obesity present an already established factor correlated to populations in developing economies, and significantly related to higher mortality (Colpani et al., 2018; Tucker et al., 2001). To this date, the overall prevalence of overweight and obesity amongst adults (ages 18+) is already high in these countries, starting from Montenegro 59.4% and 23.3%, respectively, North Macedonia 58.1% and 22.4%, Albania 57.7% and 21.7%, Serbia 57.1% and 21.5%, Bosnia and Herzegovina 53.3% and 17.9% (GHO, 2016), Kosovo 25.0% - 42.5% and 30% - 63% (Rexhepi et al., 2015). One ageing study performed in several countries including Albania, shows a prevalence of overweight and obesity in older subjects as high as 46.7% and 36.3%, respectively. Notwithstanding, there is a need for more data with respect of the overweight and obesity in older populations within the studied countries, whereas future studies analyzing this aspect could help bring more light on the issue. A fact to be noticed is that often health-inappropriate behaviors tend to be associated together, such as: physical inactivity with smoking, overweight or obesity, providing a potentially fatal combination that halts the increase in life expectancy, or even lowers it.

Morbidity, polypharmacy and life expectancy

Morbidity, polypharmacy and life expectancy are strongly correlated concepts. Medicines are used to prevent, treat or cure diseases, contributing in higher life expectancy. Regardless, higher life expectancy is accompanied with an increase of co-morbidities prevalence, showing the importance of age-related drug prescription (Shi et al., 2008).

In the existing literature, polypharmacy is not yet defined, since this is dependent from the present comorbidities. A systematic review on this issue emphasized that (most commonly) polypharmacy is considered when the patients is taking five or more medicines, while proposing the term of "appropriate polypharmacy" (Masnoon et al., 2017). The benefit of medicines usage is high in terms of quality of life, but polypharmacy has its negative consequences in health as well. This is mainly because of the adverse drug events and drug-drug interactions, which can lead to hospitalization and medicines induced morbidities. The prevalence of polypharmacy is expected to rise currently, especially when vulnerable group are patients above 65 years of age, as long as there are worldwide changes in proportion of older population (WHO, 2019).

Studies related to the current status of polypharmacy, its everyday life implications, morbidity and mortality are focused in developed countries, while this cannot be said for Western Balkans region. As pointed out by Kim et al. (2017), about 30% of adults aged 65 years and older take 5 or more medications in developed countries. But how is this situation in the countries of interest for this study?! There is a general scarce of comparable scientific evidence with their developed counterparts. In addition, existing studies have different methodologies, focus, inclusion criteria and year of publication which results in

inconsistency of the data. Some of these data show that the prevalence of polypharmacy (defined: ≥ 5 medicines) was found to be 10.4% in seniors in Serbia (Gazibara et al., 2013). Studies in Bosnia and Herzegovina found that this prevalence in population aged ≥ 65 years was 3.6% (Marković-Peković and Škrbić, 2016) and 48.1% (Alic et al., 2011). Another study in this country, found polypharmacy (defined: ≥ 3 medicines) in 74% of the hospitalized patients aged from 45 - 50 years (Trumic et al., 2012). To the best of our knowledge, there are still missing comparable data that could shed light on the matter. In terms of achieving higher life expectancies, observational, longitudinal and multi-centered research are needed. These measures would help these countries to build proactive and trustworthy policies which will contribute to the aim itself, as long as aging brings new challenges and opportunities in the health care system and age related medicines prescription.

Conclusion

Ageing is an important life process. Successful ageing is an achievement and a life milestone for everyone. A society's success should be estimated on the percentage of older populations and the quality of life these age groups live. Yet, this process can be a challenge in many countries, especially in developing ones. Countries from the western Balkans, even though geographically part of Europe, are amongst the latest remaining outside of the EU. Notwithstanding the turmoil most of them underwent in the last decades, the current development rate and socio-economic progress is promising. The continuous increase of expected life expectancy is a promising sign for a better quality of life for the whole population. Nevertheless, this will undoubtedly come with certain difficulties and obstacles, especially in terms of the continuous increase of older population.

Behavioral factors can affect the expected life expectancy. Increasing physical activity, avoiding smoking as well as decreasing overweight and obesity present reliable mechanisms to invest in terms of providing a better lifestyle and quality of life.

References

Aburto, J.M., Wensink, M., van Raalte, A., Lindahl-Jacobsen R., 2018. Potential gains in life expectancy by reducing inequality of lifespans in Denmark: an international comparison and cause-of-death analysis. BMC Public Health 18(1), 831. Available at: https://doi.org/10.1186/s12889-018-5730-0.

Alic, A., Pranjic, N., Ramic, E., 2011. Polypharmacy and decreased cognitive abilities in elderly patients. Med. Arh. 65(2), 102-105. Available at: https://www.ncbi.nlm.nih.gov/pubmed/21585185.

Bongaarts, J., 2006. How long will we live? Popul. Dev. Rev. 32, 605-628. Available at: https://doi.org/10.1111/j.1728-4457.2002.00013.x.

Colpani, V., Baena, C., Jaspers, L., van Dijk, G.M., Farajzadegan, Z., Dhana, K., Tielemans, M.J., Voortman, T., Freak-Poli, R., Veloso, G., Chowdhury, R., Kavousi, M., Muka, T., Franco, O.H., 2018. Lifestyle factors, cardiovascular disease and all-cause mortality in middle-aged and elderly women: a systematic review and metaanalysis. European Journal of Epidemiology 33, 831–845. Available at: https://doi.org/10.1007/s10654-018-0374-z.

Eurostat, 2020. Life expectancy by age and sex. Available at: https://ec.europa.eu/eurostat/home? Last accessed: April, 2020.

Gashi, S., Berisha, M., Ramadani, N., Gashi, M., Kern, J., Dzakula, A., Vuletic, S., 2017. Smoking behaviors in Kosova: results of STEPS survey. Zdr. Varst. 56(3), 158-165. Available at: https://doi.org/10.1515/sjph-2017-0021.

Gazibara, T., Nurkovic, S., Kisic-Tepavcevic, D., Kurtagic, I., Kovacevic, N., Gazibara, T., 2013. Pharmacotherapy and over-the-counter drug use among elderly in Belgrade, Serbia. Geriatr. Nurs. 34(6), 486−490. Available at: https://doi.org/10.1016/j.gerinurse.2013.08.002.

GHO data, 2016. WHO. Available at: https://www.who.int/gho/ncd/risk_factors/overweight/en/. Last accessed: April, 2020.

Kenney, W.L., Wilmore, J.H., Costill, D.L., 2012. Physiology of sport and exercise, 5th ed. Human Kinetics Publishers. Illinois, USA.

Kim, J., Parish, A.L., 2017. Polypharmacy and medication management in older adults. Nurs. Clin. North Am. 52(3), 457-468. Available at: https://doi.org/10.1016/j.cnur.2017.04.007.

Kosovo Census, 2011. Kosovo Agency of Statistics. Estimation of Kosovo population 2011. Available at: https://ask.rks-gov.net/media/2129/estimation-of-kosovo-population-2011.pdf. Last accessed: April, 2020.

Marković-Peković, V., Škrbić, R., 2016. Long-term drug use and polypharmacy among the elderly population in the Republic of Srpska, Bosnia and Herzegovina. Vojnosanit Pregl. 73(5), 435-441. Available at: https://doi.org/10.2298/vsp150224032m.

Masnoon, N., Shakib, S., Kalisch-Ellett, L., Caughey, G.E., 2017. What is polypharmacy? A systematic review of definitions. BMC Geriatr. 17(1), 230. Available at: https://doi.org/10.1186/s12877-017-0621-2.

Mons, U., Müezzinler, A., Gellert, C., Schöttker, B., Abnet, C.C., Bobak, M., de Groot, L., Freedman, N.D., Jansen, E., Kee, F., Kromhout, D., Kuulasmaa, K., Laatikainen, T., O'Doherty, M.G., Bueno-de-Mesquita, B., Orfanos, P., Peters, A., van der Schouw, Y.T., Wilsgaard, T., Wolk, A., Trichopoulou, A., Boffetta, P., Brenner, H., CHANCES Consortium. 2015. Impact of smoking and smoking cessation on cardiovascular events and mortality among older adults: meta-analysis of individual participant data from prospective cohort studies of the CHANCES consortium. BMJ 20, 350:h1551. Available at: https://doi.org/10.1136/bmj.h1551.

OECD. 2020. DAC List of ODA Recipients. Available at: http://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf. Last accessed: April, 2020.

Qin, R., Chen, T., Lou, Q., Yu, D., 2013. Excess risk of mortality and cardiovascular events associated with smoking among patients with diabetes: meta-analysis of observational prospective studies. Int. J. Cardiol. 167(2), 342-350. Available at: https://doi.org/10.1016/j.ijcard.2011.12.100.

Rexhepi, S., Bahtiri, E., Rexhepi, M., Sahatciu-Meka, V., Rexhepi, B., 2015. Association of Body Weight and Body Mass Index with bone mineral density in women and men from Kosovo. Mater Sociomed. 27(4), 259-262. Available at: http://doi.org/10.5455/msm.2015.27.259-262.

Shi, S., Mörike, K., Klotz, U., 2008. The clinical implications of ageing for rational drug therapy. Eur. J. Clin. Pharmacol. 64(2), 183-199. Available at: http://doi.org/10.1007/s00228-007-0422-1.

Taylor, A.W., Johnson, M.J., 2008. Physiology of exercise and healthy ageing. Human Kinetics Publishers. Illinois, USA.

Trumic, E., Pranjic, N., Begic, L., Bečić, F., 2012. Prevalence of polypharmacy and drug interaction among hospitalized patients: opportunities and responsabilities in pharmaceutical care. Mater. Sociomed. 24(2), 68-72. Available at: http://doi.org/10.5455/msm.2012.24.68-72.

Tucker, K.L., Buranapin, S., 2001. Nutrition and aging in developing countries. J. Nutr. 131(9), 2417S-2423S. Available at: http://doi.org/10.1093/jn/131.9.2417S.

WHO, 2020. Obesity and overweight. Available at: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight. Last accessed: April, 2020.

WHO, 2015. Prevalence of tobacco smoking. Age-standardized prevalence of current tobacco smoking among persons aged 15 years and older (%). Available at: http://gamapserver.who.int/gho/interactive_charts/tobacco/use/atlas.html. Last accessed: April, 2020.

WHO, Tobacco control fact sheet, 2016. The Former Yugoslav Republic of Macedonia. Health impact of tobacco control policies in line with the WHO Framework Convention on Tobacco Control (WHO FCTC). Available at: http://www.euro.who.int/__data/assets/pdf_file/0011/312599/Tobacco-control-fact-sheet-TFYRofMacedonia.pdf?ua=1. Last accessed: April, 2020.

WHO, 2016. World Health Statistics: Monitoring Health for the SDGs Sustainable Development Goals. Available at: https://apps.who.int/iris/handle/10665/206498. Last accessed: April, 2020.

WHO, 2019. Medicines Safety in Polypharmacy. Available at: https://apps.who.int/iris/bitstream/handle/10665/325454/WHO-UHC-SDS-2019.11-eng.pdf?ua=1. Last accessed: April, 2020.

Wilmoth, J.R., 2000. Demography of longevity: past, present, and future trends. Exp. Gerontol. 35, 1111-1129. Available at: http://doi.org/10.1016/s0531-5565(00)00194-7.

Worldbank, 2016. Smoking prevalence. Available at: https://data.worldbank.org/indicator/SH.PRV.SMOK.FE. Last accessed: April, 2020.

Worldbank, 2017. Life expectancy at birth. Available at: https://data.worldbank.org/indicator/SP.DYN.LE00.FE.IN?display=map&end=2017&start=2017&view=bar. Last accessed: April, 2020.

Zare, H., Gaskin, D.J., Anderson, G., 2015. Variations in life expectancy in Organization for Economic Co-operation and Development countries – 1985–2010. Scand. J. Public Health 43(8), 786-795. Available at: http://doi.org/10.1177/1403494815597357.

Резиме

Однос помеѓу очекуваниот животен век, бихејвиоралните фактори и полифармацијата во земјите од Западен Балкан

Арбен Бошњаку[1,2] *, Ермира Красниќи[2]

[1]Медицински факултет, Универзитет во Ѓаковица „Фехми Агани", ул. Исмаил Ќемали б.б., 5000 Ѓаковица, Косово
[2]Колеџ за медицински науки Резонанца, Блок Шелѓет-Ветерник, 10000 Приштина, Косово

Клучни зборови: животниот век, полифармација, Западен Балкан, прекумерна тежина, дебелина

Стареењето претставува мултидисциплинарен процес кој се карактеризира со постепено зголемено време на хомеостаза и намалено време на реакција и перформанси. Очекуваниот животен век е важна мерка за проценка на здравствената состојба на населението и перформансите на здравствениот систем, и истата се карактеризира со постепено зголемување во современиот свет. Овој зголемен тренд се менува помеѓу различните земји и општества, додека се под влијание на неколку внатрешни, надворешни и бихејвиорални фактори.

Овој труд претставува наративен преглед што ги анализира и споредува земјите од Западен Балкан, сите класифицирани како земји со среден приход.

Зголемување на физичката активност, избегнување на пушењето, како и намалување на прекумерната телесна тежина и дебелина, претставуваат веродостојни механизми за обезбедување подобар животен стил и квалитет на живот. Полифармацијата претставува друг интегрален дел во овој процес, кој влијае и е во корелација со сите други фактори. Сите овие фактори треба да бидат земени предвид при креирањето на политики, здравствени пристапи и планови за интервенција.