

Młynarska Magdalena, Nowicki Grzegorz, Misztal Okońska Patrycja, Korecka Renata, Goniewicz Mariusz, Naylor Katarzyna. The regression analysis of predictors for selected health behaviors among elderly in Poland. *Journal of Education, Health and Sport*. 2018;8(4):256-265. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1221401>
<http://ojs.ukw.edu.pl/index.php/johs/article/view/5425>
<https://pbn.nauka.gov.pl/sedno-webapp/works/863505>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).
1223 Journal of Education, Health and Sport eissn 2391-8306 7

© The Authors 2018:

This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland

Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license

(<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 05.03.2018. Revised: 10.03.2018. Accepted: 19.04.2018.

The regression analysis of predictors for selected health behaviors among elderly in Poland

**Magdalena Młynarska, PhD¹, Grzegorz Nowicki, PhD²,
Patrycja Misztal Okońska, PhD¹, Renata Korecka, MA¹,
Mariusz Goniewicz, MD, PhD¹, Katarzyna Naylor, MA³**

¹Department of Emergency Medicine, Medical University, Lublin. Poland

²Community Nursing Unit, Chair of Oncology and Environmental Health, Medical University of Lublin

³Medical Simulation Center, Medical University, Lublin, Poland

Abstract

The meaning of the word health takes on a different connotation in relation to certain individuals or groups. The trend is visible when taking under consideration the health of elderly individuals or the entire population in this age category. Even more, there has been noticed a great spread in individuals belonging to this age group, given that the elderly person is considered to be one that completed 65 years of life until the diversified its end. Therefore, such a wide age range covering approximately 20 - 30 years demands diverse criteria for persons aged 70 years and the ones aged 90 years.

The purpose of the study was to identify predictors influencing the health behaviors of people over 65 years of age in Poland.

On the one hand, older age allows a sense of satisfaction, fulfillment and understanding for the meaning of the whole past life. On the other hand, it can be a source of physical and mental pain, the cause of dissatisfaction and frustration. All in all, the manner in which this period is experienced depends on numerous factors. These include both genetic and individual factors as well as social aspects. However, the most important ones are considered to be health behaviors of seniors. For that reason, taking into account the perspective of aging Poland, joint preparation for old age should become a priority undertaking.

Key words: health behaviors, aging, health of seniors

Introduction

Aging process of human beings is inevitable. To begin, prehistory indicated that people lived up to 30 years old; the elderly man in ancient times was considered an individual aged 35 - 40 years. Afterwards, generally understood "development" resulted in lengthening the life considerably. In result nowadays, there is a common belief that old age begins after completion of 65 years of age. The reasons for that are many changes in social functioning, mental and physical, which have taken place. Consequently, these changes lead to death. However, it should be remembered that old age itself is not a disease. Aging is an irreversible physiological process, which results in passing away.

On the one hand, elderly age allows a sense of satisfaction, fulfillment and understanding for sense of the whole past life. On the other hand, it can be a source of physical and mental pain, a cause of dissatisfaction and frustration. Therefore, the manner in which this period is experienced depends on many factors. These include both genetic and individual factors as well as social aspects. Nevertheless, the most important ones are considered to be health behaviors of seniors.

Methods

The main objective of this work is to isolate predictors influencing behavior of elderly. Research tools applied in the research were:

- Own questionnaire. The first part deals with social information. The second part of the questionnaire relates to medical factors, health condition in general. While the third focuses on the financial situation of the elderly.
- Inventory of Health Behaviour (IZZ) Z. Juczyńskiego.
- The Satisfaction with Life Scale (SWLS) Dienera E., Emmons R. A., Larson R.J and Griffin S., the author of Polish adaptation Z. Juczyńskiego.

Database was created using Excel for Windows XP. The results were statistically analyzed. Regression analysis was used (entered method).

Results

The study included 505 subjects, patients of Primary Health Care, pass 65 years of age. Examined group of 315 elderlies in majority consisted of women (62.4%), male were 190 patients (37.6%). When taking into account the place of living, the most numerous were inhabitants of towns, 333 people (65.9%); rural area was occupied by 172 people (34.1%). Furthermore, when considering the level of education regarding examined group, it should be noted that the percentage of educated people (university education and college) was similar to the ones with lower education (vocational education, basic education, lack of education). Additionally, the greater percentage of examined group were elderlies with at least 1 up to 3 health conditions, a total of 246 people (48.7%) and from 4 to 8 health conditions - 214 patients (42.4%). It is worth noting that among outliers: meaning no illnesses or 9 or more health conditions, the first ones constituted a larger group - 30 people (5.9%). 9 people complained about 9 or more illnesses.

The results indicate that the largest group among surveyed constituted people with low levels of life satisfaction, whereas the smallest group was that of people with high levels of life satisfaction. Moreover, there were subjected to analysis regarding the level of satisfaction with life, as well as various categories of health behaviors concerning people over 65 years of age. In details, the highest level of life satisfaction exhibited elderlies whose health behaviors were mainly concerned with preventative actions. While, the lowest level of satisfaction was assigned to those who's the most abided category of health behaviors was related to healthy eating habits. All in all, the level of satisfaction with life has a statistically significant impact on individual categories of health, what is illustrated in Table 1 and Figure 1.

The conclusions can be drawn based on the mentioned table (Table 2) regarding selected predictors having the strongest impact on the health behaviors of people over 65 years of age. R², that is, the degree of adjustment of the model to the data - higher the value, the better it is (the model is more fitting). Furthermore, it can be claimed that based on that model 44,5% of variations regarding the variable IZZ might be explained (0,445=44,5%). Beta - a standardized coefficient, which (like the coefficient of r-Pearson) can be interpreted in terms of direction as well as strength of correlation. Therefore, it has become apparent which predictor had a greater impact on the dependent variable.

Based on the analysis of all beta coefficients it can be noted that the strongest influence on health behaviors according to IZZ have: SWLS (beta = 0.439), followed by gender and assessment of the financial status (0.174 and -0.177, respectively), afterwards education (0.129), and subjective evaluation of once health condition (0.073).

Further analysis reveals that health behaviors according to IZZ are influenced by:

1. SWLS (Satisfaction with Life Scale) - higher it is the better level of health behaviors is observed
2. female gender
3. financial status- more positive the assessment, higher the level of health behaviors
4. level of education- with an increase in the level of education raises the level of health behaviors
5. subjective assessment of one health condition- higher it is, the better level of health behaviors.

Discussion

The problem of aging is today one of the most important issues of demography in the world, however, mostly in the European countries considered as "the oldest ones in the region." Moreover, the World Health Organization (WHO) considers this state of affairs as tremendous success of civilization, but also emphasizes that it is a big challenge for insurance schemes, health and financial services¹. Additionally, according to forecasts provided by the UN in year 2030 in Europe, the proportion of people aged over 65 years will amount to 23.8%. For comparison this percentage was twice as low in 1990. Exactly the same trends are visible in Poland. Furthermore, this is also illustrated by the data published by the Polish Central Statistical Office. The aging of Polish population causes an increase in the occurrence

¹Trafiałek E. „Polska starość w dobie przemian, WN „Śląsk”, Katowice 2003, s.236

of diseases typical for geriatric age what contemporary researchers call "big problems of geriatric". In addition, a new problem for older people is the phenomenon of "lonely death", which has been described by Japanese authors². As well as, not without reason, the year 2012 was named by the European Parliament and the Council of the European Union – The European Year for Active Ageing and Solidarity between Generations. What is more, the most noticeable phenomenon in Poland is an increased number of deaths among men, rather than women of the same age. This phenomenon is called "excess mortality". Whereas in '80s the phenomenon was about 80% higher in men than women, then in the 90's it has exceeded 90%. This gap is still very large³. Furthermore, those facts were confirmed in our research, where surveyed group greatest percentage constituted women. The age range of the studied population is mainly 65 – 75 years old, mostly people living in urban centers, having a high school education, declaring themselves as a laborers and still in relationships.

The increase in life expectancy after 2002 has slightly slowed down. In 2007 the average life expectancy was 79.7 for women and for men 71.0 years, with a study by Eurostat showing that men sustained good health condition in 86% of their life, whereas women 84%. Additionally, another fact results from it, meaning people over the age of 65 can expect that the rest of life (more than half) they will endure in good health. As well as, for women it will be about two years more than men⁴.

Among the most common complaints of people over the age of 65 is a visual impairment, mobility problems and hypertension - according to the research. Furthermore, data publishes in 2010 by the Spanish National Health Surveys stated that the issue of disability (e.g. mobility problems), particularly in older age groups is increasing⁵. The situation is similar in Poland, where PolSenior research showed that just over 20% of people 85 years old and over has been assigned a considerable degree of disability - being synonymous with a complete inability to work⁶. Likewise, research done by English researchers suggested that in people aged 65 and over who did not have initially problems with mobility, after 2 years of follow-up there was reported initial limitation of functional

² Fukukawa Y. Solitary Death: a new problem of an aging society in Japan . Journal of the American Geriatrics Society, Volume 59 pp. 174-175

³ Rządowa Rada Ludnościowa. Sytuacja Demograficzna Polski. Raport 2010-2011. Umieralność i trwanie życia. Warszawa 2011: 133-156

⁴ Wojtyniak B., Goryński P. (red) Sytuacja zdrowotna ludności Polski. Narodowy Instytut Zdrowia Publicznego – Państwowy Zakład Higieny Warszawa 2008

⁵ Palacios-Cena D. i wsp. Has the Prevalance of Disibility Increased Over the Past Decade (2000-2007) in Elderly People? A Spanish Population – based Survey. J Am Med Dir Assoc 2010

⁶ Mossakowska M.,Więcek A.,Błędowski P. red. Aspekty medyczne, psychologiczne, socjologiczne i ekonomiczne starzenia się ludzi w Polsce, Termedia Wydawnictwo Medyczne, Poznań 2012:81-95

capacity⁷. Similar results could be observed in a study conducted by Kenny RA, Rubenstein, Laurence Z. et al.⁸. Even more, numbers of diseases for which complain seniors is also changing. The Central Statistical Office based on data from 2009 reported that the average number of illnesses per one person above 60 years of age was - 3.3. Whereas, in the research conducted for the purposes of this paper it accounted on average 4.4 conditions per 1 person.

Particular categories of health behaviors extracted from the Inventory of Health Behavior (IZZ) by Juczyński correlated significantly with gender of the study population. Moreover, own findings have demonstrated that each category has a statistically significant difference. Other results were observed by Koziel et al, who investigated the population of elderly people studying at the University of the Third Age and a control group; the outcomes indicated that the former showed no significant gender difference, whereas in the second group gender effect was statistically significant only in the case of mental attitude. For men the mean value amounted to 18.37, while for women 16.87⁹. When comparing this result to own research the mean value of the category regarding positive mental attitude in women was 19.07 and 17.97 in males. The result, therefore, proved to be different. Moreover, when analyzing the overall level of health behaviors in case of men and women with other results, it was diverse. In details, our scrutiny showed that the average level of health behavior at the level of 75.6 was lower than in studies Dębska et al, which was 86.8¹⁰. Such a large difference might appear due to the fact that the subjects were listeners of the University of the Third Age, and so it could be assumed that most of them had higher education, and that had a significant impact on the health behaviors. Even more, researchers obtained a higher score in 2009 in Sanok, Smolen et al, where the overall rate was 88.39 IZZ¹¹.

Satisfaction with life is an important factor contributing to the well-being of elderly people. Research conducted by Prusik et al among people aged 60-70 years shown that people often undertaking health practices such as exercise had significantly higher levels of

⁷ Seidel D., Brayne C., Jagger C. Limitations in physical functioning among older people as a predictor of subsequent disability in instrumental activities of daily living. *Age Ageing* 2011; 40:463-469

⁸ Kenny, R. A., Rubenstein, Laurence Z., Tinetti, M. E., Brewer, K., Cameron, K. A., Capezuti, Liz, John, D. P., Lamb, S. E. (Sallie E.), Martin, F., Rockey, P. H., Suther, M. and Peterson, E. W.. (2011) *Summary of the updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons*. *Journal of the American Geriatrics Society*, Volume 59 (Number 1). pp. 148-157

⁹ Koziel D., Kaczmarczyk M., Naszydłowska E., Gałuszka R. Wpływ kształcenia w Uniwersytecie Trzeciego Wieku na zachowania zdrowotne ludzi starszych. *Studia Medyczne* 2008;12:23-28

¹⁰ Dębska G., Korbek-Pawlas M., Zięba M. i wsp. Jakość życia, a zachowania zdrowotne w grupie uczestników Uniwersytetu Trzeciego Wieku – badania wstępne. *Zdrowie Publiczne* 2012;122(1):48-54

¹¹ Smoleń E., Gazdowicz A., Żyłka-Reut A. Zachowania zdrowotne osób starszych. *Pielęgniarstwo XXI w;* 3(36)/2011:5-9

SWLS (feeling of satisfaction with life) than the others¹². Our study confirmed the above. It was noted that the higher the level of life satisfaction, the higher was the level of health behaviors.

In addition, each person has a certain ability of subjective reasoning leading us to choose what may be good and what is bad for us. Sadly, and on the contrary there are also people who argue that a person is not always aware of what is best for once well-being. Both theories come together in one place - both want to get the answer to the question of how to derive more joy, satisfaction with life and deal with it in a positive perspective¹³, especially among the elderly.

¹² Prusik K., Zaporozhanov V., Prusik K. i wsp. Rekreacyjne uprawianie Nordic wal king, a jakość życia osób w wieku 60-70 lat. *Problemy kultury fizycznej i sportu*. 2010;9:115-117

¹³ Czapiński J. Spotkanie dwóch tradycji hedonizmu i eudajmonizmu. (w) *Psychologia pozytywna. Nauka o szczęściu, zdrowiu, sile i cnotach człowieka*. Czapiński J.(red).2004 Warszawa PWN:13-17

References:

1. Trafiałek E, Polska starość w dobie przemian, WN „Śląsk”, Katowice 2003, pp.236.
2. Fukukawa Y. Solitary Death: a new problem of an aging society in Japan . Journal of the American Geriatrics Society, Volume 59 pp. 174-175
3. Rządowa Rada Ludnościowa. Sytuacja Demograficzna Polski. Raport 2010-2011. Umieralność i trwanie życia. Warszawa: 2011 pp 133-156.
4. Wojtyniak B, Goryński P (red) Sytuacja zdrowotna ludności Polski. Narodowy Instytut Zdrowia Publicznego – Państwowy Zakład Higieny Warszawa 2008
5. Palacios-Cena D et al. Has the Prevalance of Disability Increased Over the Past Decade (2000-2007) in Elderly People? A Spanish Population – based Survey. J Am Med Dir Assoc 2010
6. Mossakowska M, Więcek A, Błędowski P. (red.) Aspekty medyczne, psychologiczne, socjologiczne i ekonomiczne starzenia się ludzi w Polsce, Termedia Wydawnictwo Medyczne, Poznań 2012 pp 81-95
7. Seidel D, Brayne C, Jagger C. Limitations in physical functioning among older people as a predictor of subsequent disability in instrumental activities of daily living. Age Ageing 2011; 40:463-469
8. Kenny, R. A., Rubenstein, Laurence Z., Tinetti, M. E., Brewer, K., Cameron, K. A., Capezuti, Liz, John, D. P., Lamb, S. E. (Sallie E.), Martin, F., Rockey, P. H., Suther, M. and Peterson, E. W.. (2011) *Summary of the updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons*. Journal of the American Geriatrics Society, Volume 59 (Number 1). pp. 148-157
9. Kozieł D, Kaczmarczyk M, Naszydlowska E at al. Wpływ kształcenia w Uniwersytecie Trzeciego Wieku na zachowania zdrowotne ludzi starszych. Studia Medyczne 2008;12:23-28
10. Dębska G, Korbel-Pawlas M, Zięba M. at al. Jakość życia, a zachowania zdrowotne w grupie uczestników Uniwersytetu Trzeciego Wieku – badania wstępne. Zdrowie Publiczne 2012;122(1):48-54
11. Smoleń E, Gazdowicz A, Żyłka-Reut A. Zachowania zdrowotne osób starszych. Pielęgniarstwo XXI w; 3(36)/2011:5-9
12. Prusik K., Zaporozhanov V., Prusik K. i wsp. Rekreacyjne uprawianie Nordic walking, a jakość życia osób w wieku 60-70 lat. Problemy kultury fizycznej i sportu. 2010;9:115-117

13. Czapiński J. Spotkanie dwóch tradycji hedonizmu i eudajmonizmu. (w) Psychologia pozytywna. Nauka o szczęściu, zdrowiu, sile i cnotach człowieka. Czapiński J.(red). Warszawa: PWN 2004, pp 13-17

TABLES

Table 1 Influence of life satisfaction on the level of individual categories of health behaviors by IZZ

Health behaviour	SWLS		Low level		Mean level		High level		Statistical analysis	
	M	SD	M	SD	M	SD	H	p	differences between-groups	
Level of health behaviors	65,13	15,17	82,23	11,29	85,66	11,71	171,899	<0,001	I-II, I-III, II-III	
Proper eating habits	14,99	4,75	20,38	4,39	20,58	4,72	126,344	<0,001	I-II, I-III, II-III	
Preventive behaviors	18,00	5,67	20,80	4,22	23,49	3,81	83,994	<0,001	I-II, I-III, II-III	
Mental attitude	15,09	4,28	20,09	3,56	22,00	3,48	186,823	<0,001	I-II, I-III, II-III	
Health practices	17,05	4,27	20,96	3,29	19,59	3,41	85,832	<0,001	I-II, I-III, II-III	

Table 2 Regression analysis

Independent variables	Beta	t-statistic
	Czynnik II	
	Skorygowane $R^2=0,445$, $F=10,870$, $p<0,001$	
Gender	-0,177	<0,001
Education	0,129	<0,001
Subjective assessment of health status ^A	0,073	0,050~
Assessment of financial situation ^B	-0,174	<0,001
Inventory of health behavior	0,439	<0,001

R^2 – the degree of adjustment of the model to the data; **F**, **p** – statistic model and its significance;
~ borderline of significance

^A higher value of the variable indicates better assessment regarding the health status

^B higher value indicates a worse financial situation

FIGURES

Figure 1 The impact of the level of satisfaction with life on individual categories of health behaviors by IZZ

