









# Self-Management of the Elderly and the Old-Efficiency and Significance

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## Abstract

**BACKGROUND:** Self-management is an active approach to coping and assuming responsibility on the part of a person, independently or in collaboration with medical specialists, to manage his/her health status. In cases of chronic diseases, the stigma of an uncertain future is a norm; it dominates and often suppresses the everyday routine. In this context, the need of training in self-management appears to be a pressing one in socially significant diseases, and is aimed at helping patients, especially elderly and old ones, cope with the clinical symptoms, with the psycho-social consequences in the way of life and with the changes in risky behavior.

**AIM:** Researching the level of informity of people aged 65 or more, considering activities for self-observation and self-control and resources of health information.

**MATERIALS AND METHODS:** An anonymous survey of randomly selected 340 people aged 60 and over was conducted in the period from April 2020 to February 2021. Methods applied: Descriptive statistics with amount-measured quantities. To analyses the data there have been used: Dispersive analysis (one-way ANOVA), alternative analysis, non-parametric analysis-Pearson's criterion of agreement ( $\chi^2$  -ksi-square) at the testing of hypotheses for statistically significant correlation between factorial and resultative indices; and correlational analysis according to Spearman and graphic analysis. For standard of significance of the zero hypothesis, there has been perceived  $p < 0.05$ .

**RESULTS:** The obtained data serve as sufficient grounds to claim that the level of awareness of the use of simple diagnostic activities for self-management and self-control is inadequate in view of the predominant chronic conditions. The information requested by the respondents reflects significant educational needs connected mainly with their condition—77.9%, drug therapy—54.4%, behavioral risk factors and prophylactic measures and recommendations.

**CONCLUSION:** The respondents showed clearly expressed preferences, willingness, and desire to be informed by medical specialists—doctors and nurses. Their contribution in the sphere of health education so far has been insufficient, humble, and yet to develop its full potential.

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## Introduction

The process of ageing of the population is becoming one of the most significant social transformations of the 21<sup>st</sup> century. With the advancement in age, problems ensuing from involutive processes and functional peculiarities should not be underestimated, as well as those connected with morbidity which shows a marked upward trend. The elderly suffers from greater in number chronic conditions [1]. Chronic non-infectious diseases prevail, and due to their high incidence, they cause considerable economic, social, and demographic damage. In cases of chronic diseases, the stigma of an uncertain future is a norm; it dominates and often suppresses the everyday routine.

A number of research shows that there exists a complex of social factors and traditions,

which are of great significance not only for the development of the organism, but also for its health status. It's of great significance also, to deal with the problem, the fact if the individual has all the necessary information about the risk factors and the unhealthy habits and is educated in leading a healthy lifestyle [2], [3], [4].

What is needed to manage chronic conditions efficiently is a change in the treatment paradigm and the development of an educational concept integrating health promotion, the social-psychological aspects of medical procedures with therapeutic and rehabilitation approaches [5].

Self-management is a challenge and a responsibility for a person, independently or in collaboration with medical specialists, to manage his/her health status on a daily basis.

In recent years, self-management has become a widely used term for behavioral interventions as well as for healthy behavior [6], [7].

Knowledge of self-monitoring and self-control of the major health signs also refers to virtually healthy people, including children, and for elderly patients with chronic conditions it is mandatory for the purpose of treatment and coping with clinical symptoms, with the psycho-social consequences in the patients' way of life, as well as with changes in risky behavior [5]. This provides the chance to manage effectively the risk of complications, and to attain a good quality of life in conditions of chronic pathology. High health-related literacy and adequate behavior enforce the protection and restoration of individual, group and public health, and ensure productive longevity [8], [9].

Training the elderly and their families helps to ensure information support in making the best decisions concerning their health-related behavior. Thus, the elderly is given the opportunity to take an active part in the process of self-monitoring and self-control as far as health is concerned. They begin to provide an active assistance in matters concerning their personal health, and the risk of omissions and errors in adapting and maintaining the best possible level of quality of life, regardless of the condition, is kept to a minimum [10], [11]. Training is conducted in cases of diabetes mellitus, arterial hypertension, obesity, chronic obstructive pulmonary disease, and a wide range of other chronic conditions [12], [13], [14], [15].

### ***Aim the research***

Researching the level of infirmity of people aged 65 or more, considering activities for self-observation and self-control and resources of health information.

## **Materials and Methods**

### ***Research methods***

The following methods were used descriptive statistics of quantifiable values.

### ***Sample***

A direct, individual, anonymous survey of randomly selected 340 elderly and old people, aged 60 and over, was conducted during visits to hospitals and out-patients' centers. The survey started in April 2020 and finished in February 2021. Each of the respondents has given their written consent form, as an autonomous individual, to participate in the research.

### ***Analysis technique***

1. Describe the results are presented as mean values (Mean), standard deviation (Std. Deviation) and standard error mean, dispersion analysis (one-way ANOVA)
2. Alternative analysis was applied in the processing of quantitative parameters, and the result was presented as a relative share
3. Pearson's criterion of consent ( $\chi^2$ - $\chi$  square) was used in testing hypotheses for statistically significant relationship between the examined factorial and resultative features;
4. Correlation analysis in the method of Spearman was applied for the purpose of assessing the degree of dependence between the examined parameters; graphic analysis was used for the purpose of illustrating the processes and phenomena, as well as certain regularities or dependencies
5.  $p < 0.05$  was assumed as the level of significance of the zero hypothesis.

The used research medium has been tested for its correctness at a preliminary conducted pilot research.

## **Findings and Discussion**

A total of 340 people participated in the survey. An analysis of the age distribution showed that the respondents aged 60–70 had greatest relative share—50.6%, those aged 71–80 amounted to 43.5%, and the ones aged 81+ – a mere 5.9%. In terms of gender distribution, 58.2% of the respondents were women, and 41.8% - men. Their distribution by educational level was as follows: 55.9% - high school graduates; 21.2% - middle school graduates; 11.8% had university degrees; 8.2% - college degrees; and 2.9% had no educational qualifications. The ethnic heterogeneity of the respondents required that specific life-style, cultural, and religious specifics be taken into consideration. The survey showed that 75.6% of the respondents defined themselves as Bulgarian.

The survey also showed that the majority of the respondents were city dwellers – 62.4%, while 37.6% lived in the country. About 87.3% of the surveyed stated that their pension was their main source of income and it was highly insufficient, only 20.9% of them could meet their expenses with the income they had. Ageing is usually associated with greater and greater costs; since most of their conditions are chronic, their treatment takes a long time, in some cases for as long as they live, and in some cases expensive therapeutic procedures are necessary. A comparison of the declared personal income with the official poverty line for the country for

2021 (369 BGN) showed that over half of the surveyed (57.1%) lived below the poverty line.

The results from the survey show that 44.1% of the surveyed were diagnosed with diseases of the circulatory organs (Figure 1), followed by those with respiratory diseases (25.6%), with musculoskeletal conditions (24.1%), with disorders of the nervous system (18.7%), etc. A typical feature of the pathology in this age range is its multiplicity. In this regard, 27.7% of the surveyed suffered from one disease, while 49% stated two or three conditions.

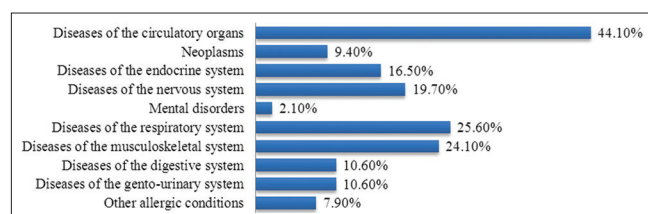


Figure 1: Leading diseases of the surveyed sample. The distribution as percentage exceeds 100% because most elderly people state that they suffer from two or three chronic conditions

The analysis of the results shows that on average women suffer from a greater number of diseases  $p = 0.046$  ( $u = 2.003$ ). Women frequently have three or more diseases (33.4%), whereas the percentage of men not affected by any diseases is greater (21.1%)  $p = 0.036$  ( $\chi^2 = 15.00$ ).

As regards "place of residence," it was established that city dwellers suffered from a greater number of diseases on average  $p = 0.011$  ( $u = 2.56$ ) and they also suffered from chronic conditions more often  $p = 0.002$  ( $\chi^2 = 13.00$ ).

The analysis of the chronic conditions in terms of "ethnic origin" shows that the greatest percentage of the surveyed without chronic conditions were of Turkish origin (24.6%), whereas the percentage of those unaware if they had a chronic condition or not was the greatest among those of Roma origin (16.7%)  $p = 0.022$  ( $\chi^2 = 11.40$ ). It was established that 65.2% of the people from the low-income group (of up to 150 BGN) stated they were registered as out-patients on account of a chronic disease  $p = 0.006$  ( $\chi^2 = 10.08$ ).

Our survey showed that the technical means the respondents had at their disposal to monitor their health status included: A thermometer – 86.5%, blood pressure cuffs – 84.7%. A considerably smaller proportion of them had scales – 31.5%, and a blood glucose meter – 9.1%.

The survey findings led us to establish that the level of awareness of the respondents of the use of simple diagnostic measures of self-monitoring and self-control is inadequate in view of the prevailing chronic conditions. The main monitoring techniques that most of the respondents used are taking the temperature – 84.4%, and measuring their blood pressure – 75.3%. Only 9.1% knew how to measure their blood sugar levels, and they had blood sugar meters to control this parameter.

An important factor in the prophylaxis of women and one of the established methods is the monthly self-examination of the mammary glands, and the timely detection of changes is of vital importance. Only 4.4% of the surveyed women stated they knew how to perform such a self-examination. This result shows that efforts should be made to increase women's awareness and knowledge in this respect so that they could develop the necessary self-examination habits (Figure 2).

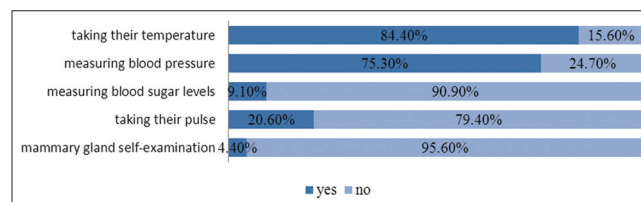


Figure 2: Ability to apply self-control techniques and methods

In terms of "educational qualifications," the findings show that respondents with higher educational qualifications more often have blood pressure measuring devices  $p = 0.001$  ( $\chi^2 = 27.86$ ) and scales  $p = 0.01$  ( $\chi^2 = 13.17$ ). This group of respondents is also better acquainted with and uses self-control methods and techniques: Taking their temperature  $p = 0.038$  ( $\chi^2 = 10.15$ ), blood pressure  $p = 0.001$  ( $\chi^2 = 37.29$ ), pulse  $p = 0.021$  ( $\chi^2 = 11.55$ ), and mammary gland self-examination  $p = 0.025$  ( $\chi^2 = 11.15$ ) (Table 1).

The dependence of the utilization of self-control methods and techniques on ethnic origin shows that the respondents of Roma origin rarely take their temperature (50.0%)  $p = 0.001$  ( $\chi^2 = 18.53$ ) and measure their blood pressure (22.2%)  $p = 0.001$  ( $\chi^2 = 31.24$ ). A possible reason could be the shortage of funds needed to purchase the respective technical devices, as well as the low level of health culture.

As regard self-control methods, it is of note that the respondents who live on their own monitor their condition more rarely, for example, blood pressure (74.3%)  $p = 0.004$  ( $\chi^2 = 13.23$ ), as compared to those living with their spouse (89.1%) and their children (92.3%). With elderly people, loneliness often leads to destabilization in both emotional and health aspect. This totally changes the elderly's sensitivity to life in all its dimensions and aspects.

The analysis of the results in terms of "place of residence" shows that the surveyed living in the countryside monitor their somatic indices, such as blood pressure, more rarely  $p = 0.019$  ( $\chi^2 = 5.92$ ), as compared to city dwellers (79.7%). The same refers to temperature - (78.9%)  $p = 0.032$  ( $\chi^2 = 4.737$ ), as compared to those residing in the city (87.7%). Those living in rural areas are mainly elderly and old people, with low educational qualifications and deteriorated social-economic status, which emphasizes the need of adequate educational and training initiatives.

With elderly people, chronic diseases usually

**Table 1: Knowledge of and ability to use self-control methods and techniques as related to educational qualifications**

Educational qualifications	Taking temperature		Measuring blood pressure		Measuring pulse		Mammary gland self-examination	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Without any educational qualifications	50.0	50.0	40.0	60.0	10.0	90.0	–	100
Middle-school	83.3	16.7	55.6	44.4	8.3	91.7	–	100
Secondary school	85.3	14.7	77.4	22.6	23.2	76.8	4.2	95.8
College	85.7	14.3	96.4	3.6	21.4	78.6	14.35	85.7
University	90.0	10.0	95.0	5.0	32.5	67.5	7.5	92.5

call for a certain diet  $p = 0.012$  ( $\chi^2 = 8.88$ ). In terms of “place of residence,” the respondents who live in the city stick to a certain diet more often—35.8%  $p = 0.004$  ( $\chi^2 = 8.23$ ), as compared to those residing in the countryside—21.1%. A possible reason for those results could be the higher number, on average, of the diseases that city dwellers suffer from, which require maintaining a certain diet. With regard to the findings stated above, we also believe that the elderly who live in the city have a better health culture and access to more health information on the role and importance of a balanced diet.

Medical specialists play a key role in health education and self-management training—they motivate and support the elderly and encourage them to raise their awareness [16], [17], [18], [19], [20], [21]. In this respect, what is of note is the fact that 61.5% of the respondents stated they had never been trained about the health care for the respective condition, and the percentage of those living in the countryside is greater. All of the surveyed who gave a positive answer—38.5% and confirmed they had been trained by a medical specialist, also provided answers to the question about how they had received health information. The results show that medical specialists prefer printed materials - flyers and brochures—25.3%, followed by talks—7.9%, and other methods—5.3% (no details of the form).

Over 2/3 of the surveyed with university degrees declare they have been trained by a nurse of the health care for their disease  $p = 0.001$  ( $\chi^2 = 26.31$ ). The higher level of educational qualifications means a higher level of health culture, a keen interest in and need of health knowledge through training and active involvement in it.

It is of note that 48.1% of the respondents living in the city have been trained more often by a nurse as to the adequate health care for their disease  $p = 0.001$  ( $\chi^2 = 21.84$ ). This is not surprising since city dwellers have access to more information from medical specialists.

The information required by the respondents is presented in Figure 3 and illustrates the considerable educational and training needs, which are mainly condition-related—77.9%, related to the adequate therapy—54.4%, behavioral risk factors, and prophylactic measures and recommendations.

With regard to “ethnic origin,” it is established that respondents of Roma origin show the least interest in obtaining information on the disease

(66.7%)  $p = 0.006$  ( $\chi^2 = 10.34$ ), as compared to the other ethnic groups - Turkish (92.3%) and Bulgarian (75.1%). The poorer the health culture is, the riskier the behavior of the respondents as regards health is.

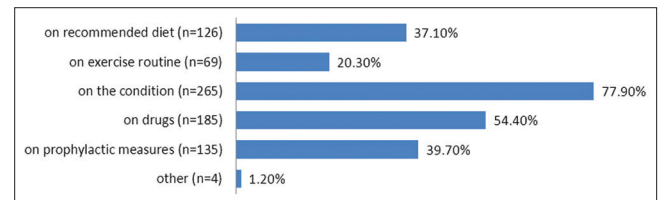


Figure 3: Needed information

The sources of health information can be of different levels of reliability, from traditional to innovative. The preferences of the surveyed in this regard are considerably dependent on social-demographic characteristics—age, gender, educational qualifications, occupation, social status, etc. As shown in Figure 4, most of the surveyed receive information from traditional sources - television 85.6% and the printed press 21.8%. National television campaigns aimed at raising people’s awareness, including their awareness of risk factors in certain diseases, are becoming more and more popular.

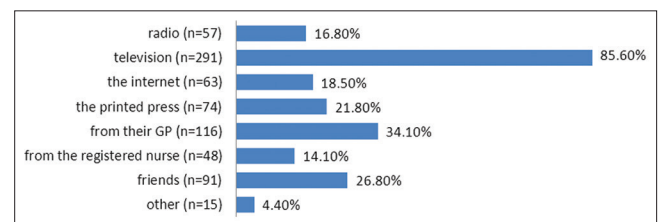


Figure 4: Sources of health-related information The total exceeds 100% because the surveyed selected more than one option.

Figure 4 showed, more than 1/3 of the respondents (34.1%) stated as their main source of information their GP, and only 14.1% - their registered nurse. It is of note that 18.5% of the surveyed got their information from the internet.

The new technologies are constantly changing the world around us. The useful opportunities they offer are enormous, and interest in using them as a source of information is growing among the elderly. In the future, the new generations of elderly people are expected to have greater experience and better practical skills for using the modern technologies. This is a good prospect in view of the fast advance of telemedicine as a new concept combining healthcare with modern technologies for the purpose of effective communication and consultancy from a distance.

**Table 2: Sources of information in terms of place of residence**

Place of residence	Television (%)	The Internet (%)	The GP (%)	The registered nurse (%)	Friends (%)	Total (%)
In the city	13.2	23.1	42.0	18.4	22.2	100
In the countryside	22.7	10.9	21.3	7.0	34.4	100

The statistical analysis shows that women are more inclined to use the printed press as a source of health information  $p = 0.008$  ( $\chi^2 = 6.95$ ), as compared to men (12.0%).

It has been established that people with poorer educational qualifications obtain health information mainly from the radio – 19.4% of the middle school graduates, 15.8% of the secondary school graduates,  $p = 0.028$  ( $\chi^2 = 10.90$ ). The data show that people with higher educational qualifications - (39.3%) college graduates and (30.0%) university graduates, use the printed press as their main source of information  $p = 0.001$  ( $\chi^2 = 21.54$ ). It is explicable and not at all surprising that the respondents with a university degree use the internet more often – (40.0%)  $p = 0.001$  ( $\chi^2 = 34.36$ ); a moderate correlational dependence has been established  $p = 0.001$  ( $r = -0.313$ ). Senior citizens/retirees/state that television is their main source of health-related information  $p = 0.001$  ( $\chi^2 = 27.71$ ).

In terms of “place of residence,” it was established that 22.7% of the ones living in the countryside get information from television  $p = 0.035$  ( $\chi^2 = 5.11$ ). Of those living in the city: 42.0% are informed by their GP  $p = 0.001$  ( $\chi^2 = 15.15$ ), 23.1% receive information from the Internet  $p = 0.006$  ( $\chi^2 = 7.84$ ) and 18.4% are informed by the registered nurse  $p = 0.004$  ( $\chi^2 = 8.50$ ). Those results illustrate the limited opportunities and failure to meet adequately the informational needs of the elderly living in the countryside (Table 2).

The analysis shows that respondents with an income of over 369 BGN use and rely on the internet as a source of information 24.7%  $p = 0.008$  ( $\chi^2 = 9.71$ ), as well as the printed press 26.0%  $p = 0.05$  ( $\chi^2 = 5.82$ ), which are both connected with funds. These are expenses that are excessive for most of the elderly who somehow get by on pensions below the poverty line.

In the process of research, we attempted to identify the most preferred sources of information. The relative share of the respondents opting to trust their GP is the highest (51.2%), followed by those who trust their registered nurse (30.6%). The trust in medical specialists is the right choice when it comes to obtaining medical information. This gives medical specialists the opportunity to adopt an individual approach and to exert a positive influence on the elderly’s personal motivation, especially in the cases when a change in the behavior is necessary, for the sake of their health.

## Results

- The analysis of the social status and health condition as self-evaluation of the surveyed

evidences polymorbidity. Most elderly people suffer from 2 to 3 and more conditions

- The level of awareness of the use of simple diagnostic apparatuses and self-monitoring and self-control measures is highly inadequate in view of the widespread chronic conditions
- The information that the surveyed would like to receive reflects considerable educational needs, mostly connected with the main condition—77.9% drug therapy—54.4%, behavioral risk factors and prophylactic measures and recommendations
- The media constitute the main source of information, but the surveyed expressed the readiness and willingness to be informed by medical specialists – their GP and the registered nurse. The contribution of these medical specialists in terms of health education to date has been quite humble, and their potential in this respect is yet to be realized

## Conclusion

At this modern stage of the development of science, the role of health education has been proven. It is a process of life-long learning, as people learn how to live in order to maintain and improve their own health status. In this context, the need of self-management education and training of elderly people suffering from socially significant diseases is unquestionable.

The training activities should focus on health education as a process of training the elderly how to cope with different health-related situations, how to adopt healthy habits and behavior leading toward making the right decisions for managing the respective situations adequately.

## References

1. Alekova S, Slavova V, Ivanov V, Ovcharov I, Platikanova M. The role of family doctors in Bulgaria in solving the main medical and social problems which are of direct concern to elderly people. *Trakia J Sci.* 2015;13(2):256-9. <https://doi.org/10.15547/tjs.2015.s.02.057>
2. Nikolova M, Tineshev S. Comparison of the body mass index to other methods of body fat assessment in Bulgarian children and adolescent. *Biotechnol Biotechnol Equip.* 2010;24:329-37. <https://doi.org/10.1080/13102818.2010.10817857>
3. Tineshev SL Nikolova M. Anthropological characteristics of

- body composition in children and adolescents from Plovdiv. *Biotechnol Biotechnol Equip.* 2010;24(Suppl 1):338-41. <https://doi.org/10.1080/13102818.2010.10817858>
4. Nikolova M, Boyadjiev D. Relation between body composition and some social factors and habits in children and adolescents. *Acta Morphol Anthropol.* 2011;17:156-62.
  5. Vodenicharov TS, Popova S, Mutafova M, Shipkovenska E. *Emergency Medical Services Social Medicine.* Sofia: Gorex Press Publishers; 2013.
  6. Lorig KR, Holman H. Self-management education: History, definition, outcomes, and mechanisms. *Ann Behav Med.* 2003;26(1):1-7. [https://doi.org/10.1207/S15324796ABM2601\\_01](https://doi.org/10.1207/S15324796ABM2601_01)  
PMID: 12867348
  7. Lorig KR, Sobel DS, Stewart AL, Brown BW Jr., Bandura A, Ritter P, et al. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: A randomized trial. *Med Care.* 1999;37(1):5-14. <https://doi.org/10.1097/00005650-199901000-00003>  
PMid:10413387
  8. Vizeva M. *The Quality of Life and Health-Care Management of People with Diabetes, Type 2.* Sofia: Gorex Press Publishers, Author's Summary of Dissertation; 2014.
  9. Vizev KR. *Social and Health Aspects of Premature Ageing and its Prophylaxis.* Author's Summary of Dissertation. Sofia: Gorex Press Publishers; 2017.
  10. Nikolova M, Mollova D, Tineshev SL. Peculiarities in body composition of children. comparison of anthropometric and bioelectrical impedance methods. *J Biomed Clin Res.* 2009;2:121-6.
  11. Mihailova K, Bivolarski I, Baltov M, Raykova E, Alakidi A. The role of purposeful physical activity by means of the exercise complex for elderly and elderly people. *Eurasian Union of Scientists, Medical Sciences* 2015;2(11):129-134.
  12. Alekova S, Slavova V, Platikanova M, Parashkevova B. Socially significant diseases and their frequency in general medicine. *Trakia J Sci.* 2010;8(2):369-73.
  13. Gibson PG, Powell H, Wilson AJ, Abramson M, Haywood P, Bauman A, et al. Self-management education and regular practitioner review for adults with asthma. *Cochrane Database Syst Rev.* 2002;2002(3):CD001117. <https://doi.org/10.1002/14651858.CD001117>  
PMid:12535399
  14. Available from: [https://www.nsoplb.com/uploads/article\\_documents/sbornik\\_s\\_dokladi\\_2011\\_g1.pdf](https://www.nsoplb.com/uploads/article_documents/sbornik_s_dokladi_2011_g1.pdf)
  15. Mladenova S, Nikolova M, Boyadzhiev D. Body mass index, some circumference indices and their ratios for monitoring of physical development and nutritional status of children and adolescents. *Acta Morphol Anthropol.* 2005;10:226-9.
  16. VonKrooM, GrumanJ, SchaeferJ, CurrySJ, WagnerEH. Collaborative management of chronic illness. *Ann Intern Med.* 1997;127(12):1097-102. <https://doi.org/10.7326/0003-4819-127-12-199712150-00008>  
PMid:9412313
  17. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient Self-management of chronic disease in primary care. *JAMA.* 2002;288(19):2469-75. <https://doi.org/10.1001/jama.288.19.2469>  
PMid:12435261
  18. Deakin TA, Cade JE, Williams R, Greenwood DC. Structured patient education: The diabetes X-PERT program makes a difference. *Diabet Med.* 2006;23(9):944-54. <https://doi.org/10.1111/j.1464-5491.2006.01906.x>  
PMid:16922700
  19. Chudiak A, Lomper K, Jankowska-Polańska B, Uchmanowicz I. The impact of diabetes education on the assessment of the quality of life of patients Type 2 diabetes. *Nurs Probl.* 2015;23(1):1-6. <https://doi.org/10.5603/PP.2015.0001>
  20. Korzon-Burakowska A, Adamska K, Skuratowicz-Kubica A, Jaworska M, Świerblewska E, Kunicka K. Effect of education level on diabetes control and quality of life in insulin-treated Type 2 diabetic patients. *Diabet Prakt.* 2010;11(2):46-53.
  21. Ho TM, Estrada D, Agudo J, Arias P, Capillas R, Gibert E, et al. Assessing the impact of educational intervention in patients with hypertension. *J Ren Care.* 2016;42(4):205-11. <https://doi.org/10.1111/jorc.12165>  
PMid:27458081