Relationships Between Health Behaviors, Self-Efficacy, and Health Locus of Control of Students at the Universities of the Third Age

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Background: This study aimed to determine the relationship of health behaviors with the health locus of control and the sense of self-efficacy against the background of socio-economic factors and self-rated health among students of the Universities of the Third Age (U3As).

Material/Methods: The study included 320 U3A students, with mean age of 67.5 years. The following research tools were used: Health Behavior Inventory (HBI), Multidimensional Health Locus of Control Scale (MHLC), Generalized Self-Efficacy Scale (GSES), and an original survey of the author’s own design.

Results: Mean total HBI and GSES scores were 90.63 and 30.12, respectively. These results are satisfactory. A slight predominance of internal health locus of control was documented. A number of significant correlations were found between the HBI, GSES, and MHLC scores, except for the MHLC subscale expressing the influence of chance. Educational attainment was shown to have a significant impact on the scores for the positive attitude and proper dietary habits subscales of HBI, as well as on the GSES scores. Economic status of the participants influenced the levels of positive attitude, internal health locus of control, and self-efficacy. Furthermore, internal health locus of control was found to be modulated by subjective health of the respondents. The scores for external health locus of control and the influence of chance increased significantly with age.

Conclusions: The currently noticeable emphasis placed on lifelong education should serve as a good prognostic factor for health behaviors and personal health resources for years to come.

MeSH Keywords: Health Behavior • Health Resources • Socioeconomic Factors

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Background

The world population is aging at increasing speed. The rapid aging tendency leads to a constant increase in the number of people in late adulthood, which, unfortunately, is associated with an increase in the number of health-related problems.

People in late adulthood are at a high risk of cardiovascular diseases, which is related to unhealthy lifestyle and is the main cause of morbidity and death. Therefore, a diet low in fat but rich in fruit, vegetables, and fish, as well as regular physical activity, are recommended, whereas smoking and dietary habits leading to overweight and obesity should be avoided [1]. Health-related behaviors can either strengthen (health-oriented behaviors) or weaken (health-threatening behaviors) one’s health potential. Health-oriented behaviors include inter alia: appropriate dietary habits, sufficient level of physical activity, and the ability to cope with stress. Health-threatening behaviors involve using psychoactive substances (smoking, alcohol, and drug abuse), excessive use of non-prescription medications, and aggressive attitude. During the process of socialization, the key period in learning about health-related behavior is childhood and early youth, and the critical period is puberty. After puberty, all previously acquired health behaviors become set [2].

The value a person places on health is a very important motivator for health behaviors. The results of previous studies show that U3A students consider health to be the most important value [3]. In the course of life, health-related behaviors can be determined by different factors, such as age, sex, personal characteristics, health status, social roles, and environmental factors [2]. Investment in health promotion programs should result in a decreased incidence of disability among older adults [4]. Consequently, the demand for institutional care should also decrease.

Personal health resources, such as health locus of control and self-efficacy, determine health-related behaviors. High levels of the 2 aforementioned resources allow steering health-related behaviors toward a health-oriented direction more easily. A change in behaviors results from the personal attitude of an individual based on certain convictions. Personal convictions remain relatively firm and reflect the consequences of an individual’s behaviors. According to the theory of performance-outcome expectancies and self-efficacy expectancies, convictions play a crucial role in explaining behaviors and predicting changes. Outcome expectancies focus on the expected results of one’s actions. Self-efficacy is one’s belief in one’s competence to perform intended actions [5].

The available sources provide 3 types of health locus of control: internal, connected with the influence of others, and resulting from chance. Internal health locus of control is associated with the feeling of being in charge of one’s own health and should contribute to health-oriented behaviors. However, as a person grows older, the health locus of control shifts from internal to external, associated with the influence of others, for instance, health care staff. Internal health locus of control constitutes the most desired set of assumptions and expectations promoting health-oriented behaviors. This type of locus of control remains under personal control, whereas the types attributed to the influence of others (health care staff, carers) or chance constitute the external health locus of control, remaining outside of personal control. What is particularly unfavorable is the assumption that one’s health is subject to chance [5]. Such a standpoint may lead to a situation in which one begins losing control over one’s health and at the same time assuming a passive attitude toward health-threatening situations. People who feel efficient are determined to achieve their goals, which is very important to modifying their health-related behaviors [5].

Apart from the aforementioned personal resources, U3As play a significant role in developing healthy habits in older adults. The currently very popular Third Age Universities were founded as a response to the demographic and civilization changes. Currently, U3A facilities operate in many countries throughout the world and play a significant role in educating and integrating older adults, and preventing them from experiencing infirmity in old age [3]. The first U3A was founded in 1973 in Toulouse, France, by Pierre Vellas. The first U3A in Poland was founded in 1975 by Prof. Halina Szwarc. Worldwide, there are 3 types of U3As: French, British, and American. The French model is based on strict cooperation with higher education institutions, the British on self-help, and the American on education and travel, organized during summer time by academic instructors. In Poland, the French model is dominant. U3As play a significant role in gerontological prophylaxis.

Previous studies by the present author showed that these institutions contributed to preventing marginalization and minimizing stereotypes, which is of key importance to the psychological well-being of an aging individual. Moreover, it was found that U3A students very rarely experienced marginalization associated with old age, which unfortunately is a common occurrence among people with lower educational attainment [3]. These institutions bring seniors together, giving meaning to their lives. Health-threatening factors include lack of support, living alone, feeling alone, and low participation in social activities [6].

The aim of the present study was to investigate health behaviors, the health locus of control, and the sense of self-efficacy as reported by U3A students, to analyze their intercorrelations, and to discover what factors influence their levels.

The present study sought to examine the following research hypotheses: (1) U3A members demonstrate a satisfactory level of health behaviors and individual health resources (sense
of self-efficacy and health locus of control); (2) Health behaviors are dependent on socio-economic factors, particularly economic status and educational attainment; (3) Health behaviors show a correlation with the respondents’ self-rated health; (4) Self-rated health correlates with internal health locus of control; (5) External health locus of control increases with age; (6) Health behaviors show a correlation with sense of self-efficacy and health locus of control expressed on the subscales of internal locus of control and influenced by others.

Material and Methods

Characteristics of the respondents

In total, 320 subjects (92.5% women and 7.5% men) were enrolled in the study. The mean age of the participants was 67.5±6.0 years (range, 50–87). The majority of the subjects were either married (52.5%) or widowed (30.3%). Most (60%) of the respondents had secondary education and 33.4% had higher education. The vast majority of the study population was retirees (87.7%). The majority of the respondents described their financial situation as average (55.8%) or good (40.6%), the rest considered their financial situation to be bad. Most U3A participants described their health situation and physical fitness as good (42.5%) or average (39.4%), 9.4% as less than satisfactory, 7.2% as very good, and the few remaining individuals as bad. The vast majority of the study population suffered from different medical conditions (85.6%), characteristic of their age. The most frequently reported disorders were osteoarthritis (50%) and arterial hypertension (27.5%). Over half of the respondents (57.7%) declared that they very rarely required the services of medical care institutions.

Research methods and tools

The study included 320 participants recruited from 3 Universities of the Third Age in Bydgoszcz, Poland. The main inclusion criterion was participation in U3A courses. The study was conducted between April and June 2014, using an anonymous diagnostic survey. The study was a screening investigation and the survey was paper-based. The questionnaires were completed by the respondents during subsequent lectures organized by U3A in the period between April and June 2014. During the first of the series of lectures, U3A members were asked to participate in the study and to become familiar with the survey questionnaire on the socio-economic structure and health behaviors. The survey was paper-based. The questionnaires were completed by U3A members – a number which was planned to be included in the study as a representative group of the investigated population.

The following research tools were used in the survey:

1. The Health Behavior Inventory (HBI), by Zygfryd Juczyński, comprises 24 statements used to assess health behaviors in four subscales: proper dietary habits (PDH), prophylactic behaviors (PB), health-related practices (HRP) and positive attitude (PA). The overall health behavior score ranges between 24 and 120 points. The higher the score, the higher the level of the health behaviors. The score is converted to standardized units and expressed using a 10-point scale. Results between 1 and 4 are considered to be low, 5–6 moderate, and 7–10 high levels of health behaviors [5].

2. The Multidimensional Health Locus of Control Scale (MHLC) by Kenneth A. Wallston, Barbara S. Walston, Robert Walston, Robert DeVellis, adapted by Zygfryd Juczyński, is comprised of 18 statements on generalized expectations within three types of health locus of control: internal – health locus of control is mine; influenced by others – my health depends on others, especially healthcare staff; chance – my health depends on chance or other external factors. The MHLC scale is a self-assessment tool. The participant responds to the statements on a 6-point scale, where 1 corresponds to “I definitely disagree” and 6 corresponds to “I definitely agree”. The scores for each of the three subscales range between 6 and 36 points. The higher the score, the stronger the belief that a given factor affects one’s health [5].

3. A Polish version of the Generalized Self-Efficacy Scale (GSES) by Ralf Schwarzer, Michael Jerusalem and Zygfryd Juczyński. Standardized GSES scale comprises 10 questions and measures the strength of an individual’s general belief in their ability to cope in difficult situations. The score is between 10 and 40 points, where a higher score corresponds to a higher level of self-efficacy. After conversion to standardized units, the results are interpreted as follows: 1–4 correspond to low, 5–6 to medium, and 7–10 to high scores [5].

The HBI, MHLC and GSES scales were assessed in terms of their psychometric properties: reliability, validity, and normalization [5]. For the purposes of the study, the HBI, MHLC and GSES scales were purchased in their original, Polish-language version, from the Centre for Psychological Tests of the Polish Psychological Association in Warsaw, Poland. The conditions for using the said tests in the study were satisfied by the author of the present paper. The study also included a brief survey questionnaire on the socio-economic structure and health status of the studied group.

The code of ethical conduct

The study was carried out in accordance with the Declaration of Helsinki. The protocol of the study was approved by the Bioethics Committee of the Nicolaus Copernicus University Collegium Medicum in Bydgoszcz, Poland. The main inclusion criterion was participation in U3A courses. The survey was anonymous.
Statistical analysis

The normal distribution of continuous variables (standardized values of psychological scales and age of the respondents) was verified using the Shapiro-Wilk test. Statistical characteristics of continuous variables were presented as arithmetical means, standard deviations and medians. Statistical characteristics of qualitative variables (responses to the questions in the author’s survey) were shown as numeric and percentage distributions. Student’s t test and one-way ANOVA with a respective post-hoc test were used to compare continuous variables between groups. The strength and direction of linear correlations between pairs of continuous variables were analyzed using the Pearson’s coefficient of correlation (r). All calculations were carried out using Statistica 10 (StatSoft, USA). The statistical significance of all the tests was set at p≤0.05.

Results

All enrolled U3A students returned complete questionnaires and therefore the data from a total of 320 participants were included in the analysis.

Total mean HBI score amounted to 90.63±11.57. For the sub-scales, the mean results amounted to: 3.71±0.63 for proper dietary habits, 3.71±0.66 for prophylactic behaviors, 3.83±0.60 for positive attitude and 3.85±0.60 for health-related practices. For the majority of respondents (50.3%), the total HBI score was high (7–10 sten), for 37.8% moderate (5–6 sten) and for 11.9% low (1–4 sten).

The mean score for health locus of control, measured according to the MHLC scale, amounted to: 25.85±5.35 for internal control, 23.40±5.90 for influenced by others and 22.08±5.53 for chance.

The mean value for self-efficacy, measured according to the GSES scale, amounted to 30.12±5.14. The majority of the respondents (62.8%) scored high (7–10 sten), 25.2% moderate (5–6 sten) and the remaining participants low.

No significant correlation between the age of participants and their total HBI scores (r=0.043; p=0.466) was found, as well as between the total HBI scores and sex (p=0.641), marital status (p=0.970), educational level (p=0.148) and economic status (p=0.475). However, significant correlations were demonstrated between socio-economic factors and HBI subscales.

Educational level turned out to significantly correlate with the proper dietary habits score (p=0.021; Table 1). Participants with vocational education scored significantly lower on the subscale than respondents with secondary or higher education (p=0.004 in both cases). Educational level was also significantly correlated with the positive attitude scores (p=0.030; Table 1). Post-hoc analysis showed that participants with vocational education scored lower on the positive attitude subscale than participants with secondary (p=0.010) or higher education (p=0.003).

The economic status of the respondents had a significant impact on the positive attitude scores (p=0.022; Table 1). Post-hoc analysis showed that participants who considered their economic status satisfactory scored significantly higher on the positive attitude subscale than participants who considered their material status average (p=0.005).

The total HBI scores turned out to correlate significantly with the respondents’ subjective health (p=0.030). Post-hoc analysis showed that participants who considered themselves healthy scored significantly higher on the HBI scale than participants who considered themselves rather ailing (p=0.024) or very sick (p=0.019).

A significant correlation was found between the economic situation of the participants and their internal health locus of control scores (p=0.008; Table 1). Post-hoc analysis showed that participants who considered their economic situation bad scored significantly lower in internal health locus of control scale than those who considered their situation average (p=0.046), satisfactory (p=0.020) or good (p=0.001). Moreover, participants who characterized their economic status as average or satisfactory scored significantly lower in the internal health locus of control scale than those who considered their economic status good (p=0.011 and p=0.022, respectively).

Subjective health showed a significant correlation with the internal health locus of control scores (p=0.007; Table 1). Post-hoc analysis showed that participants who considered themselves in very good health scored significantly higher in internal health locus of control scale than those who considered their health not very satisfactory (p<0.001), average (p=0.003) or good (p=0.011). Furthermore, participants who considered themselves in good health scored significantly higher than those who considered their health not very satisfactory (p=0.029).

A significant correlation was demonstrated between the age of participants and their external health locus of control scores (r=0.179; p=0.004; Figure 1). Accordingly, the older a participant, the significantly greater the influence of others on their health locus of control. A significant correlation was found between age of participants and the influence of chance on health locus of control (r=0.137; p=0.030). Thus, the older a participant, the significantly greater the influence of chance on their health locus of control.
GSES scores were significantly positively correlated with the educational level (p=0.011), economic status (p<0.001) and subjective health (p<0.001; Table 2). Detailed data on the correlations between HBI, MHLC and GSES subscale scores are presented in Table 2. As shown in the table, most results within those scales are closely correlated.

Discussion

The study group, comprised of subjects with mean age of 67.5 years, receiving continuous education via U3As, showed a satisfactory mean score for health behaviors (90.63), which can be interpreted as an effect of participating in U3A courses, as these institutions aim, among other things, at promoting healthy lifestyle.

The total health behavior scores clearly correspond to the results documented in other studies conducted among U3A students [7]. Moreover, the authors showed that the scores were higher for intellectually active older adults than for those who refrained from any form of intellectual activity [6]. Lower total health behavior scores were recorded in populations of older adults not participating in U3A courses [8,9]. Furthermore, a review of the available literature showed that patients with diabetes mellitus were characterized by high health behavior scores [5]. The mean scores for diabetes mellitus patients were close to those for intellectually active older adults participating in the present study.

According to the literature, women demonstrate significantly higher health behavior scores than men and more frequently undertake activities aimed at maintaining their health [5,8,9]. This might be explained by the longer life-span of women and

Table 1. Relationships between selected socio-economic characteristics of the study participants (grouping variables) and their selected psychological characteristics (dependent variables).

| Dependent variable | Grouping variable | Educational level | p    |
|-------------------|------------------|------------------|------|
| PDH               | Primary          | 3.08±0.11        | 3.28±0.65 (1) | 3.74±0.60 | 3.75±0.65 | 3.33±0.47 | 0.021 |
| PA                | Vocational       | 3.33±0.00        | 3.44±0.95 (2) | 3.83±0.56 | 3.91±0.59 | 3.58±0.59 | 0.030 |
|                  | Secondary        |                  |                  | 3.74±0.60 | 3.75±0.65 | 3.33±0.47 | 0.021 |
|                  | Higher           |                  |                  | 3.75±0.65 | 3.75±0.65 | 3.33±0.47 | 0.021 |
|                  | Higher (PhD)     |                  |                  | 3.33±0.47 | 3.33±0.47 | 3.33±0.47 | 0.021 |

| Economic status | Highly satisfactory | Satisfactory | Moderate | Poor | p    |
|-----------------|---------------------|--------------|----------|-----|------|
| PA              | 4.02±0.91           | 3.96±0.56 (3)| 3.75±0.61| 3.67±0.56| 0.022|
| I-HLC           | 31.8±1.10           | 26.24±5.92  | 25.67±4.89| 22.71±4.98 (4)| 0.008|

| Subjective health status | Poor | Non-satisfactory | Moderate | Good | Very good | p    |
|--------------------------|------|-----------------|----------|------|-----------|------|
| I-HLC                    | 28.0±5.66 | 23.38±4.73 | 25.43±4.95| 26.12±5.76 (6) | 29.69±3.59 (5) | 0.007|

(1) – significantly lower than in individuals with secondary (p=0.004) and higher education (p=0.004); (2) – significantly lower than in individuals with secondary (p=0.010) and higher education (p=0.003); (3) – significantly higher than in individuals assessing their economic status as moderate (p=0.005); (4) – significantly lower than in individuals assessing their economic status as moderate (p=0.046), satisfactory (p=0.020) and highly satisfactory (p=0.001); (5) – significantly higher than in individuals assessing their subjective health status as non-satisfactory (p<0.001), moderate (p=0.003) and good (p=0.011); (6) – significantly higher than in individuals assessing their subjective health as non-satisfactory (p=0.029). PDH – proper dietary habits; PA – positive attitude; I-HLC – Internal Health Locus of Control.

Figure 1. Relationship between age of the study participants and their external health locus of control scores.

GSES scores were significantly positively correlated with the educational level (p=0.011), economic status (p<0.001) and subjective health (p<0.001; Table 2). Detailed data on the correlations between HBI, MHLC and GSES subscale scores are presented in Table 2. As shown in the table, most results within those scales are closely correlated.
the feminization of old age. However, women and men were not unequivocally shown to differ in terms of their health behaviors [7]. The results of previous studies investigating the problem in question are inconclusive and require further verification. Some authors report that residents of cities are more likely to display healthy behaviors [8]. The population of the present study were of residents of a city, which might also account for their high HBI scores. According to other authors, residents of cities, especially those of higher social status, have better access to education [10].

Low educational attainment proved to be associated with worse dietary habits. This observation is consistent with the results of a Taiwanese study [11]. According to some studies, the risk of low intake of fruit and vegetables is related to social isolation, being a single or widowed person, living alone, and being male [12]. Therefore, social integration provided by U3A should minimize this risk. Other reports also indicate that education is an important determinant of health-enhancing behaviors [13].

Individuals in late adulthood and persons entering late adulthood were shown to score quite high on the positive attitude subscale as compared to other HBI subscales, which is consistent with the results of this study [8,9].

Health behaviors correlated with internal and external health locus of control but not with the influence of chance. It was shown that scores for internal health locus of control were slightly higher, which should be considered positive, as internal health locus of control exerts a favorable effect on health-oriented lifestyle. A higher score for internal health locus of control is indicative of taking more responsibility for one’s health. Such an attitude of being responsible for oneself and one’s own health should constitute a part of lifelong education. In this study, internal health locus of control showed a positive correlation with the participants’ subjective health, which is consistent with the results of a Swedish study [14]. A review of other studies investigating the problem in question suggests that low internal health locus of control can be linked to depression and mental crisis [15]. According to some authors, the predominance of external health locus of control is a bad prognostic factor for an individual’s mental health [16]. As shown in some studies, high external health locus of control scores are associated with low social status [17,18]. However, this is inconsistent with the results of the present study, which determined...
was that an individual’s social status positively correlated with internal rather than external health locus of control. Moreover, it was demonstrated that the scores for external health locus of control increased significantly with age, which is rather legitimate. This can be largely explained by progressing involution and concomitance of various health conditions which require intervention of healthcare professionals and other care providers. Some large studies showed that age progression was accompanied by a significant decrease in physical activity and functional efficiency, caused by aging of the body [19].

The present study showed that internal health locus of control correlated significantly with self-efficacy, which is consistent with the results of previous studies [16]. This suggests that self-efficacy is a significant determinant of health behaviors and as such should be reinforced in the course of continuous education. In this study, self-efficacy showed significant associations with economic status and subjective health of respondents, and was only weakly correlated with their educational attainment. This means that participants with better financial status demonstrate greater self-efficacy. A review of the literature suggests that self-efficacy has a positive influence on the outcomes of self-care, therapeutic and rehabilitation processes, and the results of health awareness programs [20,21]. Other authors emphasize the benefits of educating people in terms of self-efficacy, as the outcomes of such education can be visible among older adults [22,23]. This should constitute a significant indication for professionals, especially physiotherapists. According to other reports, individuals who perceive themselves as more effective are more common among divorcees [25].

The views of some of the authors should be endorsed, whereby there is a need to aim health education for older adults with low social status [26]. The results of large studies should also be mentioned, according to which a greater tendency to pursue physical activity was shown by men and, irrespective of sex, individuals with higher social status [27]. The results of the present study and the reports of other authors clearly indicate the importance of social status, which can and should be achieved by means of continuous development, in the context of caring for one’s health.

Positive perception of aging is important in the context of preventive health behaviors [28]. U3As contribute to creating a positive model of aging; it is worth emphasizing that U3As are crucial to the social activation of older adults, which in turn promotes health behaviors. It should be mentioned here that the results of a study on a representative group of older Canadians showed that many of them are not convinced about the necessity of health behaviors and prefer a passive lifestyle [29].

The study demonstrates that individuals of low social status are the group at risk for lower scores with respect to health behaviors, sense of self-efficacy, and external health locus of control.

**Limitations and implications of the study**

The main limitation of the study was the fact that, because of its anonymous character, the only source of information on the respondents’ medical condition was self-assessment made by the participants of the study.

**Implications**

Gaining insight into and a better understanding of the complex determinants of health behaviors, including those of psychological nature, will allow for a more holistic methodology and orientation of education toward healthy and successful old age, which should be implemented from an early age.

Identifying the factors shaping health behaviors should help in setting the direction of gerontological prophylaxis and in preparing the aging world population for healthy old age.

**Conclusions**

Better eating habits and a positive mental attitude were shown in people with higher social status and higher self-efficacy. Participation in U3A prevents social isolation and thus improves a person’s psychological well-being. The general philosophy behind the role of U3A on a global scale rests on an interdisciplinary concern for the improvement of the quality of life of the ever-aging population of the world, as well as an attempt at reducing the negative effects of senile involution. It is grounded in the broadly defined education toward old age and the shaping of a wise approach of an aging individual to the rapidly changing world. Health education constitutes an important area of activity of those educational institutions. Courses organized by U3A contribute to the development of personality and, significantly, the shaping of one’s sense of responsibility for one’s own life and health, which translates into the internal health locus of control. This, in turn, translates into healthy habits. Self-realization and participation in lifelong education, including foreign language and computer literacy courses offered by U3As, contribute to the improvement of one’s sense of self-efficacy.

The currently noticeable emphasis placed on lifelong education should serve as a good prognostic factor for health behaviors and personal health resources for years to come.
Footnotes

This study was conducted as a part of statutory research carried out in the Department of Pedagogy and Nursing Didactics, Nicolaus Copernicus University Collegium Medicum in Bydgoszcz, number 976 / 2014-2015.

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Conflict of interest

None declared.