# Overall Quality of Life and General Health - Changes Related to the Retirement Threshold

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***Abstract*—In the present work, changes of the overall quality of life and general health related to the retirement threshold are studied. In particular, the influence of different factors on the satisfaction with health and the quality of life is evaluated. The results show that education, job position and activity, as e.g., the attendance of the University of the Third Age, strongly influence the satisfaction level on the overall quality of life and general health after the retirement threshold.**

***Keywords–Social medicine; Medical informatics; Correspondence analysis; University of the Third Age (U3A); World Health Organization Quality of Life-BREF (WHOQOL-BREF)***

## I. INTRODUCTION

Usually, critical moments in our life influence our lifestyle and health. One of the most important moments is the retirement. Changes in health related to the retirement threshold have been observed in numerous studies [1]-[6]. In particular, changes of the physical activity [2][7]-[17] and changes of the quality of life in different domains [18]-[22] have been broadly discussed. Some problems may be specific for particular countries, as for example depression related to the loss of the employment-based insurance [3]. Aging is a natural process, however different factors may influence it. In particular, a high level of education is known to have a positive influence on health and on the quality of life. Recently, Universities of the Third Age (U3A) became popular, and their positive influence is broadly discussed [23]-[28].

In this article, we focus on the problem from the Polish perspective. We concentrate on changes in the overall quality of life and general health related to the retirement threshold.

The article is organized as follows: in Section II we describe the applied methods, in Section III we describe the groups of the individuals who participated in the studies and the results related to the overall quality of life and to the general health. A summary is given in Section IV.

## II. METHODS

The studies are concerned with the Polish society. In order to check changes of the quality of life and of health after the retirement threshold, we compare the results for the employees and for the retirees. The quality of life and health have been determined by using the Polish version of the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire [29]. Additionally, each respondent answered several question about his/her education and the job position during the employment.

For the graphical representation of the results we apply the correspondence analysis originally introduced by Hirschfeld [30] and later improved by many authors. In this method, one obtains maps in which the objects under consideration are represented by points. In the present studies, the points represent particular groups of individuals and the answers to the questions. This kind of approach has an interdisciplinary character. In particular, we have created an analog of this kind of method in the theory of molecular similarity [31] and in bioinformatics [32].

## III. RESULTS AND DISCUSSION

The sample consists of 449 individuals who are the citizens of one of the Polish cities, Bydgoszcz, about 350 000 citizens. In the studies the whole group of individuals is split to 160 employees (100 females and 60 males) and 289 retirees (186 females and 103 males). Additionally, the group of retirees is split to two subgroups: 106 students of U3A (79 females and 27 males) and 183 non-students of U3A (107 females and 76 males).

In the present work, we study the overall quality of life and general health. Figures 1-9 show maps obtained using the correspondence analysis. Figure 1 shows the degree of satisfaction on the overall quality of life and general health of particular groups of individuals with vocational education in a 3-point scale (*positive, negative, neutral*). Figures 2 and 3

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present the same relations but for the individuals with different education: high school (Figure 2) and university (Figure 3). These relations are also shown in a 5-point scale (*A-1*,*A-2*,. . . *A-5*) for the individuals with the vocational education (Figure 4), with the high school (Figure 5) and with the university education (Figure 6). The number of individuals with doctor's degree is small and therefore the correspondence analysis can be applied only to the 3-point scale (Figure 7). Figures 8 and 9 show the degree of satisfaction on the overall quality of life and general health of particular groups of individuals with different job positions in the 3-point scale (Figure 8) and in the 5-point scale (Figure 9).

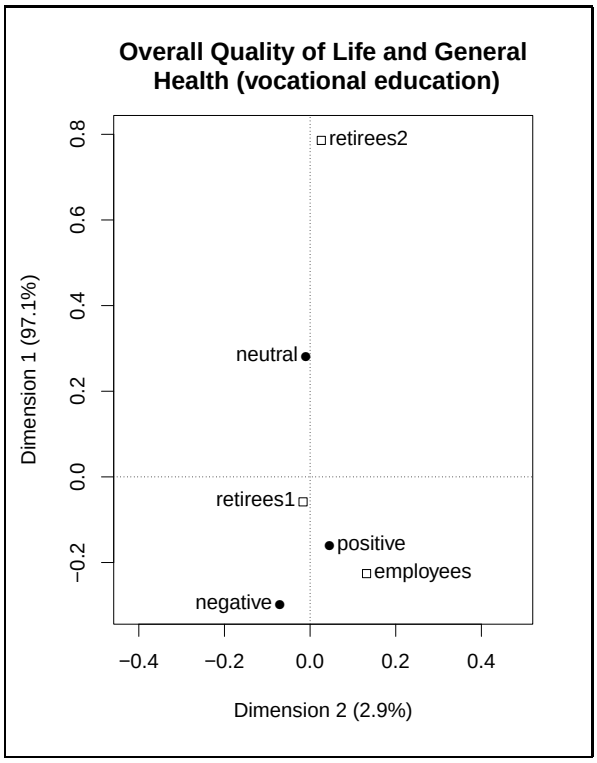


Figure 1. Map obtained using the correspondence analysis (rectangles denote groups of individuals with vocational education, circles denote answers in 3-point scale).

In all the figures, two kinds of points appear: empty rectangles and full circles. Empty rectangles denote three different subgroups of individuals: *employees*, *retirees1* (non-students of U3A), and *retirees2* (students of U3A). Full circles denote answers to the questions in the WHOQOL-BREF questionnaire. The answers are labeled as *A-1*, *A-2*, . . . *A-5* in Figures 4, 5, 6, and 9, respectively. The respondents could choose between these five answers, where *A-1* corresponds to very poor quality of life and health and *A-5* to the very good ones. In order to consider the problem in a lower resolution we collect two negative answers, *A-1* and *A-2*, to one negative answer and two positive answers, *A-4* and *A-5*, – to one positive. In Figures 1, 2, 3, 7, 8 full circles denote the answers: *positive*, *neutral* (*A-3*), and *negative*.

Figures 1-7 show maps for the individuals with different kinds of education: vocational (Figures 1, 4), high school (Figures 2, 5), university (Figures 3, 6), doctor's degree (Figure 7).

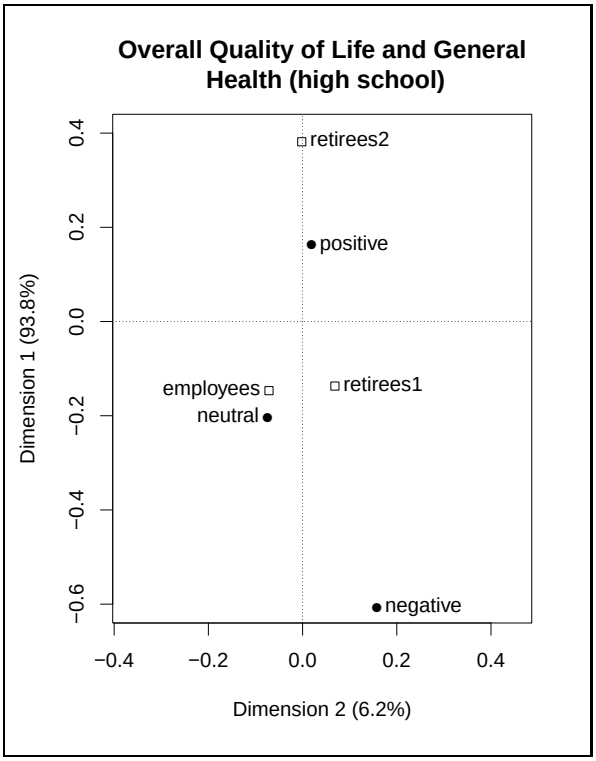


Figure 2. Map obtained using the correspondence analysis (rectangles denote groups of individuals with high school education, circles denote answers in 3-point scale).

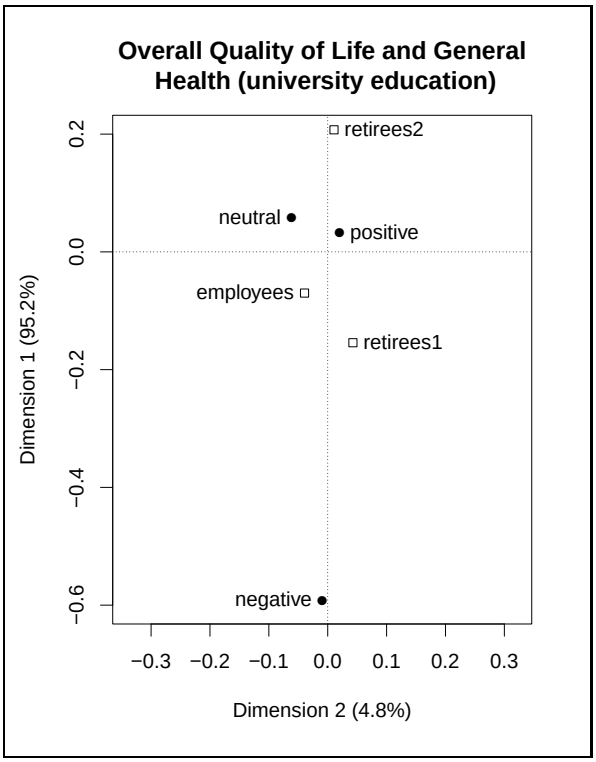


Figure 3. Map obtained using the correspondence analysis (rectangles denote groups of individuals with university education, circles denote answers in 3-point scale).

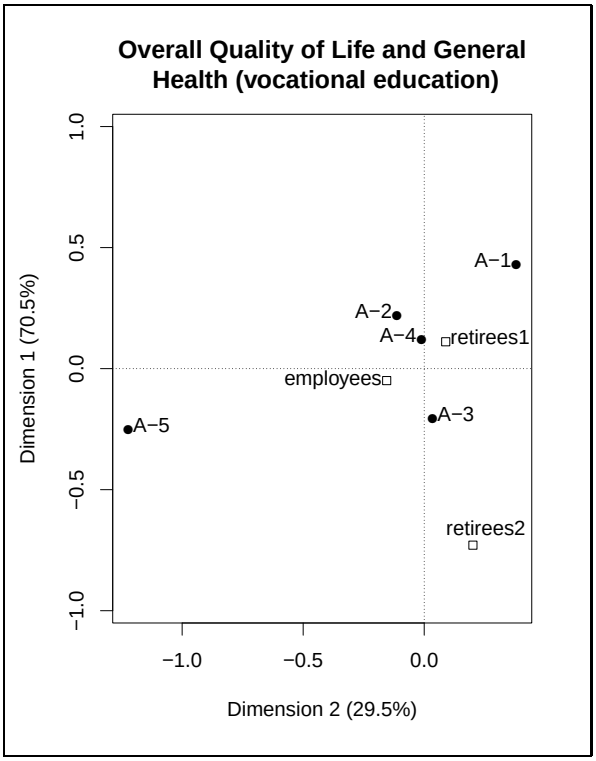


Figure 4. Map obtained using the correspondence analysis (rectangles denote groups of individuals with vocational education, circles denote answers in 5-point scale).

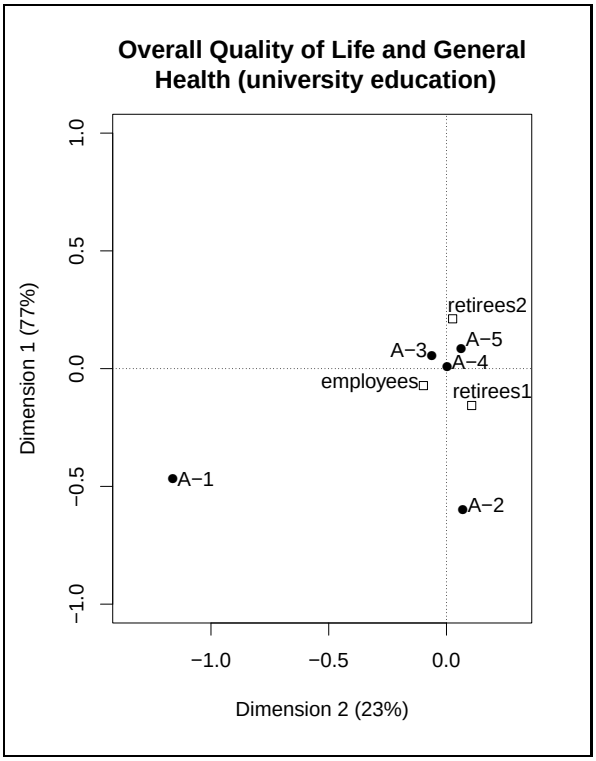


Figure 6. Map obtained using the correspondence analysis (rectangles denote groups of individuals with university education, circles denote answers in 5-point scale).

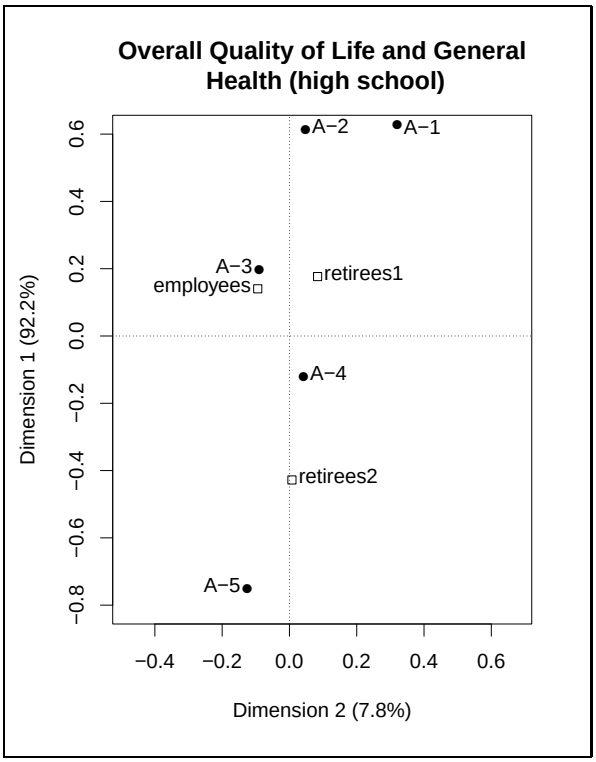


Figure 5. Map obtained using the correspondence analysis (rectangles denote groups of individuals with high school education, circles denote answers in 5-point scale).

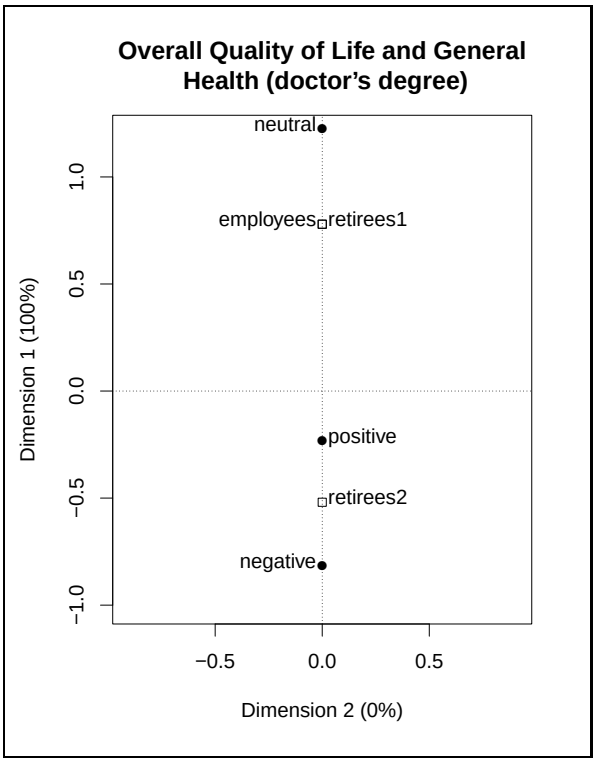


Figure 7. Map obtained using the correspondence analysis (rectangles denote groups of individuals with doctor's degree, circles denote answers in 3-point scale).

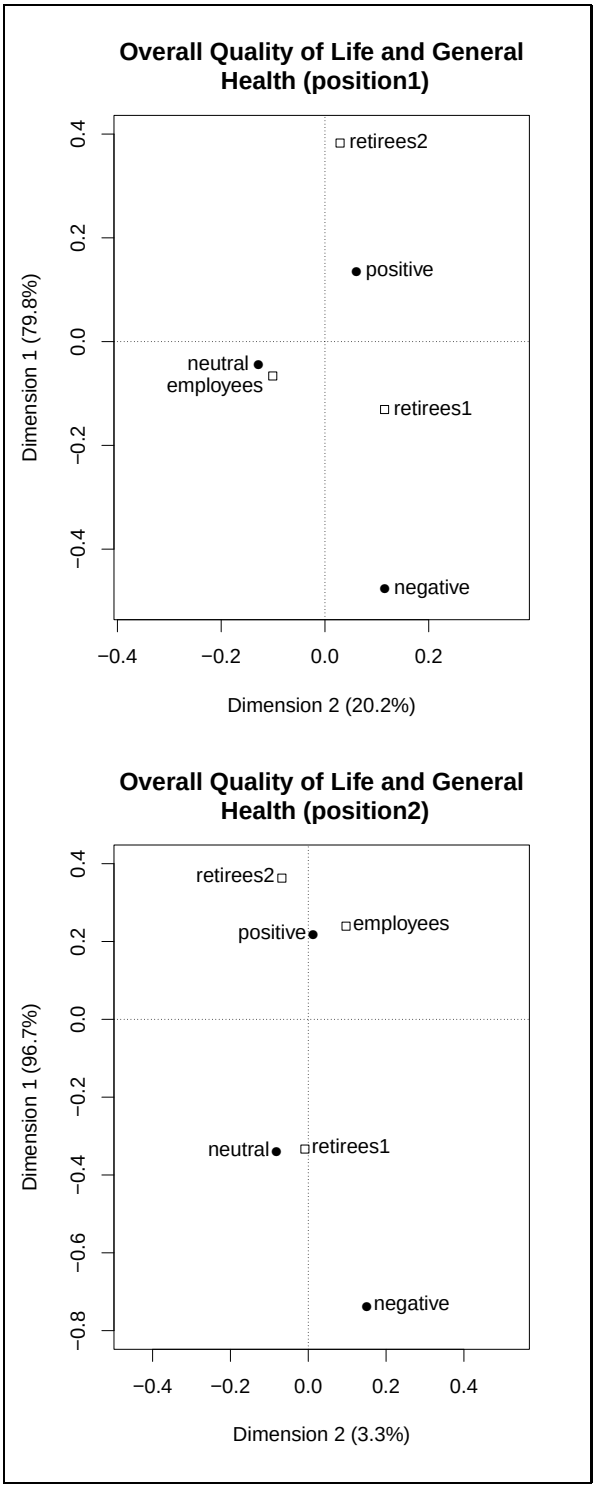


Figure 8. Map obtained using the correspondence analysis (rectangles denote groups of individuals with *position1* - top panel and with *position2* - bottom panel, circles denote answers in 3-point scale).

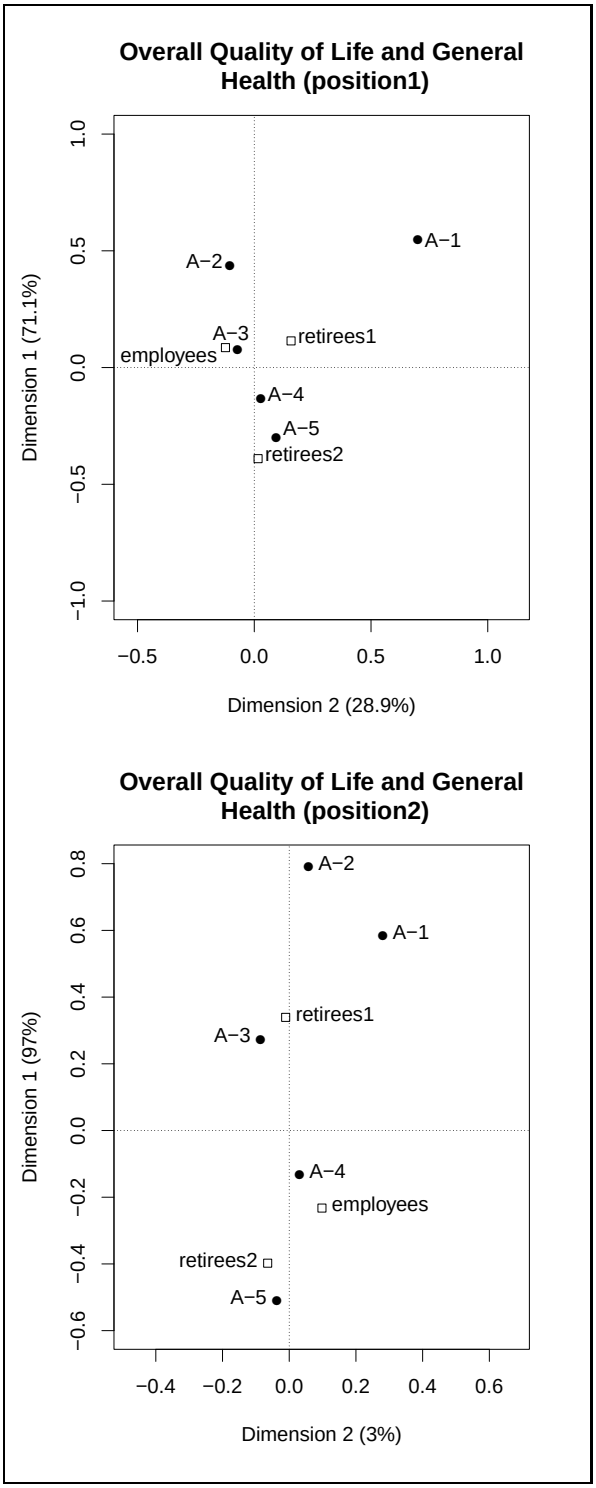


Figure 9. Map obtained using the correspondence analysis (rectangles denote groups of individuals with *position1* - top panel and with *position2* - bottom panel, circles denote answers in 5-point scale).

We also considered different job positions during the employment (Figures 8, 9): Staff is labeled as *position1*; supervisor/manager, director/president, and business owner are labeled as *position2*.

The satisfaction level on the overall quality of life and general health both for the group of employees and for the retirees strongly depends on the level of education: the structures of maps are different for the vocational, the high school, and for the university educations. Also, the intellectual activity during the retirement, such as attending the University

of the Third Age, influences the degree of this satisfaction. We observe that in the maps, the points representing *retirees2* and *retirees1* are located rather far away from each other. In the cases of the dependence on the job position, the observations are similar. The structures of maps for *position1* and for *position2* are different. The job position is an important factor influencing the satisfaction level on the overall quality of life and general health. The point representing employees is close to the neutral answer for *position1* and close to the positive one for *position2* (Figure 8). In the higher resolution this is *A-3* and *A-4* respectively (Figure 9). The group of students of U3A (*retirees2*) is the most satisfied group both for *position1* and *position2*: the closest point to *A-5* is *retirees2*.

## IV. Conclusion

Summarizing, we have shown that both education level and the job position are important factors influencing the change of the satisfaction level on the overall quality of life and general health related to the retirement threshold. We have also shown that the correspondence analysis is a convenient tool for such kind of studies.

The same methodology we are also going to apply for the studies on changes of the quality of life in different domains after the retirement threshold. Some preliminary results have already been obtained.

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