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Subjective quality of life analyses in sedentary population with different health status

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ABSTRACT: *The aim of the study was to evaluate subjective satisfaction with 24 quality of life indicators (QoLIs); measure overall quality of life (QoL) in sedentary population with different health status and compare satisfaction with QoLIs as well as an overall QoL score within three main groups of healthy population (HP; n=85), population with non-communicable diseases (PwNCDs; n=138) and population with disabilities (PwDs; n=272). The Subjective Quality of Life Analysis (S.QUA.L.A.) was used as a primary research method. 24 QoLIs measure cognitive element of subjective well-being using the 5-point rating scale. Score 1 meant the highest satisfaction and score 5 expressed the absolute insignificance of the particular indicator in life. The Pearson chi-square test was used to determine the differences of 24 QoLIs and student's two-sample t-test was used to compare QoL total score between all three evaluated groups. The highest satisfaction with QoLIs was presented by group of sedentary HP and the highest dissatisfaction was expressed by the group of PwNCDs with sedentary behaviour. All evaluated groups demonstrated the highest disappointment in their lives with political situation and justice. There was not found significant differences in overall QoL among all evaluated group with sedentary behaviours. There were found significant differences in eight QoLIs between HP and PwNCDs as well as between HP and PwD. Just few significant differences in satisfaction with QoLIs were found between sedentary PwNCDs and sedentary PwD.*

KEYWORDS: *dissatisfaction, healthy population, overall quality of life, population with disabilities, population with non-communicable diseases, quality of life indicators, satisfaction.*

I. INTRODUCTION

Prolonged periods of sedentary behaviour, defined as behaviour demanding only little energy such as sitting or lying, negatively affect the metabolic and cardiovascular systems independent of physical activity [1, 2, 3]. Sedentary behaviour, defined as energy expenditure ≤1.5 metabolic equivalents while awake and in a sitting or reclining posture [4], is emerging as a modifiable risk factor for poor health independent of physical activity [5, 6]. Human health is interconnected throughout the life span from conception to fatal life to early childhood and adolescence and on into adulthood and the senior age [7, 8]. Each stage presents its own unique health needs and problems, yet each of them is interconnected. There is compelling evidence that early life may have a profound impact on health and disease in later life [9, 10, 11]. The emerging pandemic of non-communicable diseases (NCDs) is creating major health challenges globally. NCDs are currently the leading cause of mortality causing 68 % of all deaths globally. Cardiovascular diseases, cancer, chronic obstructive pulmonary diseases and diabetes have been identified by the World Health Organization as the four major NCDs occurring worldwide [12]. Czech Institute of Public Health including among the NCDs also chronic diseases of musculoskeletal human system. Many of the NCDs can cause permanent disabilities in later life.

According to the WHO [13], disability is a set of physical or mental impairments that deprive the individual of independent personal and social life. Almost everyone experiences temporary or permanent disability at some point of life [14]. In the comprehensive guide to disability right laws, a disabled person is someone who, according to medical commission of the Welfare Organization, suffers physical, mental, psychological or combined damage with ongoing and substantial impairment in his general health and function, and reduction in his social and economic independence. Based on this guide, disabilities are categorized into 6 major and common groups including physical-motor, mental, visual, and hearing, speech and psychiatry [13].

Many people with NCDs [15, 16] and disabilities [17, 18] have poor general health, limited community participation, and low quality of their life. Promotion of health and quality of life for disabled people is one of the World Health Organization's objectives. Few investigations have shown that participation in regular physical activities has a positive effect on quality of life [19, 20], quality of family life [21] and quality of social life [22] among people with NCDs and those with disabilities. On the other hand, leisure time sedentary behaviour has been found to have stronger associations with all-cause mortality than total daily sitting time, possibly because it might be accompanied by unfavourable eating behaviours [23, 24]. Individuals who stay sedentary over longer periods of their life represent the most important target for interventions since they have the highest risk of health problems [3] that decreases their own life quality. There is evidence for associations with mortality [25, 6, 23], cancer incidence [6], diabetes [26], bone density [27] and falls [28, 29].

Considering the previous research findings, the primary objectives of our research was to (1) evaluate subjective satisfaction with 24 quality of life indicators within three main research groups of population with sedentary behaviour; (2) measure overall QoL in sedentary living population with different health statuses and (3) compare satisfaction with QoLIs as well as an overall QoL within three main groups of healthy population, population with non-communicable diseases and population with disabilities.

II. METHODS

Participants and procedure

Three population groups (n=495) with different health status were recruited for the study: healthy people (HP; n=85), people with non-communicable diseases (PwNCDs; n=138) and people with disabilities (PwDs; n=272). All three groups of population lead life style with sedentary behaviour. Participants with NCDs and with disabilities were contacted through representatives of national organisations and schools all around Slovakia unifying people with special needs. Some questionnaires were sent electronically by representatives of the organisations and some were passed out at the different meetings organised by national organisations. Pupils of special schools filled out the questionnaires during their classes with school principal permission. All data were collected during two years period (2014 – 2015). All participants with NCDs and disabilities agreed participate in the study and gave their written informed consent.

The Subjective Quality of Life Analysis (S.QUA.L.A)

S.QUA.L.A. is a multidimensional instrument. This multidimensional self-assessment method was created by Mathieu Zannotti in 1992 [30]. This scale includes 23 items (indicators) of life. It covers traditional areas (food, family relation etc.), and more abstract aspects of life (politic, justice, freedom, truth, beauty and art, love). We used second part of S.QUA.L.A. where for each indicator, participants were asked to evaluate their degree of satisfaction measuring cognitive element of subjective wellbeing using the 5-point rating scale. Score 1 (high satisfaction) meant the highest satisfaction and in the same time the highest level and score 5 (total disappointment) expressed the absolute insignificance of the particular indicator in life. For this study we modified the S.QUA.L.A. questionnaire by adding one more indicator “sport participation”. We consider the highest satisfaction with QoLIs that did not exceed 2 points of the mean score and the highest dissatisfaction with QoLIs that exceed 3.0 points of the S.QUA.L.A mean score. In this study a Slovak version of the S.QUA.L.A. was used [31].

Data analyses

Statistical analysis was performed using SPSS v. 15.0. Qualitative variables are presented as proportion and percentage. Quantitative variables are presented as mean. Pearson chi-square test was used to determine the differences in QoLIs’ satisfaction between HP, PwNCDs and PwDs. Student’s two-sample t-test was used to compare total score of subjective wellbeing between all three evaluated groups. In current study only one measurement has been made and three main groups of people with sedentary behaviour formed the study. The level of statistical significance was set at $p<.05$.

III. RESULTS

Participants

HP (17.2 %) was mostly represented by single (70.6 %) women (62.4 %) up to 29 years of age (67.1 %) with high school education level (72.9 %). 61.2 % of HP during collecting data still studied. Group of PwNCDs (27.9 %) involved mostly married (44.2 %) women (63.8 %) over 30 years of age (79.0 %) with high school education level (61.6 %). 37.7 % of PwNCDs were retirees and 37.0 % employed people.

NCDs (27.9 %) included problems of internal human systems (64.2 %) and musculoskeletal health problems (35.8 %). Musculoskeletal impairments included back pains, problems with joins (hip join arthrosis, knee arthrosis, ankle pain, etc.), damaged meniscus, flatfeet, scoliosis, muscular dysbalance, muscle fatigue, etc. Cardiovascular diseases (41.8 %) included high blood pressure, ischemic heart disease, arrhythmias, heart murmurs, valve deformities, varicose veins, etc. Metabolic diseases (34.9 %) included diabetes mellitus, DNA, celiac disease, osteoporosis, obesity, problems with pancreas, gall bladder, Crohn's disease, etc. Other impairments (23.3 %) covered hormonal system impairments, cancer, problems with excreting and gynaecologic impairments.

Table 1 Data of the 495 participants

Basic characteristics of participants		HP	PwNCDs	PwDs
		N (%)		
		85 (17.2)	138 (27.9)	272 (54.9)
Gender	Men	32 (37.6)	50 (36.2)	114 (41.9)
	Women	53 (62.4)	88 (63.8)	158 (58.1)
Age	Range 15-29 yrs	57 (67.1)	29 (21.0)	86 (31.6)
	Range 30+ yrs	28 (32.9)	109 (79.0)	186 (68.4)
Education level	Primary	12 (14.1)	29 (21.0)	59 (21.7)
	High school	62 (72.9)	85 (61.6)	172 (63.2)
	University	11 (13.0)	24 (17.4)	41 (15.1)
Merital status	Single	60 (70.6)	36 (26.1)	119 (43.8)
	Married	16 (18.8)	61 (44.2)	96 (35.3)
	Divorced	4 (4.7)	13 (9.4)	23 (8.5)
	Widow	5 (5.9)	28 (20.3)	34 (12.5)
Employment status	Employed	19 (22.4)	51 (37.0)	111 (40.8)
	Unemployed	3 (3.5)	7 (5.1)	34 (12.5)
	Student	52 (61.2)	28 (20.3)	48 (17.6)
	Pensioner	11 (12.9)	52 (37.7)	79 (29.0)

The group of PwDs (54.9 %) mostly consisted of single (43.8 %) women (58.1 %) over 30 years of age category (68.4 %) with achieved high school education level (63.2 %). 40.8 % had full time job and 29 % were retirees. This group of population included 55.8 % individuals with physical disabilities mostly with cerebral palsy, amputees, progressive muscular dystrophy, spine cord injury (quadriplegia and paraplegia), sclerosis multiplex and myelomeningocele. 41.6 % of them were deaf or hard of hearing (19.9 % hard of hearing individuals and 21.7 % deaf individuals) and 2.6 % were blind individuals. Basic participant's characteristics are presented in Table 1.

S.QUA.L.A

The highest satisfaction in the group of HP with sedentary behaviour is presented by four QoLIs that did not exceed 2.0 points of the mean score. Sedentary living HP declared the highest satisfaction in their life with children (1.700 points), food (1.788 points), home environment (1.906 points) and physical wellbeing (1.940 points of the mean score). On the other hand, the highest dissatisfaction in the group of HP with sedentary behaviour was showed in three QoLIs that exceed 3.0 points of the mean score: truth with 3.386 points, political situation with 3.565 points and justice with 3.634 points of the mean score. Overall QoL score of sedentary HP achieved 2.418 points (Table 2).

The highest satisfaction in the group of PwNCDs with sedentary behaviour was presented by three QoLIs that did not exceed 2.0 points of the mean score. PwNCDs who lead sedentary life style declared the highest satisfaction in their life with children (1.762 points), home environment (1.920 points) and family relations (1.985 points of the mean score). On the other hand, the highest dissatisfaction in the group of sedentary PwNCDs was expressed by four QoLIs that exceed 3.0 points of the mean score: truth with 3.037 points, sport in leisure with 3.094 points, justice with 3.527 points and political situation with 3.791 points of the mean score. Overall QoL score of PwNCDs with sedentary behaviour achieved 2.553 points (Table 2).

The highest satisfaction in the group of PwDs with sedentary behaviour was presented only by one QoLI that did not exceed 2.0 points of the mean score. Sedentary living PwDs declared the highest satisfaction in their life only with children (1.967 point of the mean score). On the other hand, the highest dissatisfaction in the group of sedentary living PwDs was expressed by two QoLIs that exceed 3.0 points of the mean score: justice with 3.311 points and political situation with 3.642 points of the mean score. PwDs who lead sedentary life style achieved 2.530 points of total S.QUA.L.A. score (Table 3).

Table 2 Comparison of QoLIs satisfaction and overall QoL between HP and PwNCDs

QoLIs	**Mean**		**Pearson**	
	HP	**PwNCDs**	χ^2	**sign.**
Health	2.153	2.964	**35.75**	**p<.01**
Physical wellbeing	**1.940**	2.529	**21.32**	**p<.01**
Psychological wellbeing	2.212	2.358	4.262	ns
Home environment	**1.906**	**1.920**	3.691	ns
Sleep	2.296	2.382	6.879	ns
Family relations	2.059	**1.985**	1.546	ns
Social relations	2.000	2.109	3.180	ns
Children	**1.700**	**1.762**	3.202	ns
Mobility/Daily activities	2.179	2.316	2.813	ns
Love	2.440	2.339	1.718	ns
Sexual activity	2.333	2.667	8.618	ns
Political situation	**3.565**	**3.791**	5.648	ns
Religion/Spirituality	2.531	2.511	2.621	ns
Rest in leisure	2.235	2.241	0.185	ns
Hobbies in leisure	2.388	2.409	2.010	ns
Sport in leisure	2.690	**3.094**	**10.72**	**p<.05**
Safety	2.624	2.577	5.462	ns
Work/Education	2.346	2.642	**10.74**	**p<.05**
Justice	**3.634**	**3.527**	1.454	ns
Freedom	2.707	2.481	**16.24**	**p<.01**
Beauty and art	2.524	2.500	0.977	ns
Truth	**3.386**	**3.037**	**16.39**	**p<.01**
Finances	2.400	2.927	**15.62**	**p<.01**
Food	**1.788**	2.203	**14.91**	**p<.01**
Total score			**t-test**	
	2.418	2.553	0.936	ns

Possible indicator score range is 1–5; lower mean scores indicate higher satisfaction with QoLI

Comparing the satisfaction with QoLIs among three evaluated groups of population with sedentary behaviour we found significant differences in all three comparisons. On the other hand comparison of overall QoL scores didn't show significant differences between assessed population groups with different health statuses (Table 2, Table 3, Table 4).

Significant differences in QoLIs satisfaction between sedentary HP and sedentary PwNCDs were found in eight indicators, concretely in the indicator health (p<.01), physical sports in leisure (p <.05), work/education (p <.05), freedom (p<.01), truth (p<.01), finances (p<.01) and food (p<.01). With six QoLIs were significantly more satisfied in their life sedentary HP and with freedom and truth were significantly more satisfied PwNCDs (Table 2).

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A comparison of QoLIs satisfaction between sedentary living HP and sedentary living PwDs presenting also significant differences in eight indicators, concretely with health (p<.01), physical wellbeing (p<.01), work/education (p<.01), finances (p<.01) and food (p<.01) is significantly more satisfied in their life HP with sedentary behaviour and with justice (p<.01), freedom (p<.01) and food (p<.01) PwDs (Table 3).

Table 3 Comparison of QoLIs satisfaction and overall QoL between HP and PwDs

QoLIs	**Mean**		**Pearson**	
	HP	**PwDs**	**χ^2**	**sign.**
Health	2.153	2.860	**51.44**	**p<.01**
Physical wellbeing	**1.940**	2.688	**49.71**	**p<.01**
Psychological wellbeing	2.212	2.379	3.322	ns
Home environment	**1.906**	2.089	6.054	ns
Sleep	2.296	2.267	5.644	ns
Family relations	2.059	2.015	1.533	ns
Social relations	2.000	2.059	0.797	ns
Children	**1.700**	**1.951**	6.803	ns
Mobility/Daily activities	2.179	2.330	7.478	ns
Love	2.440	2.261	5.023	ns
Sexual activity	2.333	2.512	3.598	ns
Political situation	**3.565**	**3.642**	1.471	ns
Religion/Spirituality	2.531	2.597	4.007	ns
Rest in leisure	2.235	2.239	1.396	ns
Hobbies in leisure	2.388	2.338	2.735	ns
Sport in leisure	2.690	2.846	3.798	ns
Safety	2.624	2.588	2.496	ns
Work/Education	2.346	2.745	**17.61**	**p<.01**
Justice	**3.634**	**3.311**	**18.61**	**p<.01**
Freedom	2.707	2.476	**13.34**	**p<.01**
Beauty and art	2.524	2.504	1.973	ns
Truth	**3.386**	2.801	**38.96**	**p<.01**
Finances	2.400	2.996	**25.03**	**p<.01**
Food	**1.788**	2.218	**19.42**	**p<.01**
Total score			**t-test**	
	2.418	2.530	0.837	ns

Possible indicator score range is 1–5; lower mean scores indicate higher satisfaction with QoLI

Significant differences in QoLIs satisfaction between sedentary living PwNCDs and PwDs were reported only by four indicators, concretely health (p<.05), home environment (p<.05), work/education (p<.05), and justice (p<.05). With home environment and work were significantly more satisfied PwNCDs comparing PwDs, and on the other hand with health and justice were significantly more satisfied in their lives PwDs (Table 4).

Table 4 Comparison of QoLIs satisfaction and overall QoL between PwNCDs and PwDs

QoLIs	**Mean**		**Pearson**	
	PwNCDs	**PwDs**	**χ^2**	**sign.**
Health	2.964	2.860	**10.19**	**p<.05**
Physical wellbeing	2.529	2.688	8.220	ns
Psychological wellbeing	2.358	2.379	2.971	ns
Home environment	**1.920**	2.089	**11.14**	**p<.05**
Sleep	2.382	2.267	5.601	ns
Family relations	**1.985**	2.015	3.007	ns
Social relations	2.109	2.059	2.244	ns
Children	**1.762**	**1.951**	8.140	ns

Mobility/Daily activities	2.316	2.330	3.399	ns
Love	2.339	2.261	1.611	ns
Sexual activity	2.667	2.512	4.425	ns
Political situation	**3.791**	**3.642**	6.076	ns
Religion/Spirituality	2.511	2.597	1.802	ns
Rest in leisure	2.241	2.239	2.221	ns
Hobbies in leisure	2.409	2.338	4.723	ns
Sport in leisure	**3.094**	2.846	8.466	ns
Safety	2.577	2.588	2.592	ns
Work/Education	2.642	2.745	**11.96**	**p<.05**
Justice	**3.527**	**3.311**	**12.99**	**p<.05**
Freedom	2.481	2.476	2.274	ns
Beauty and art	2.500	2.504	3.234	ns
Truth	**3.037**	2.801	6.056	ns
Finances	2.927	2.996	6.088	ns
Food	2.203	2.218	4.317	ns
Total score			**t-test**	
	2.553	2.530	0.182	ns

Possible indicator score range is 1–5; lower mean scores indicate higher satisfaction with QoLI

Furthermore we have found, that while the differences between the HP and the other two population groups (with NCDs and with disabilities) were predominantly at 1 % level of significance, differences in satisfaction with QoLIs among the NCDs and disability populations were at 5 % level of significance. Interestingly, it was found that two QoLIs general health and work showed a level of significance in all three comparisons. The highest satisfaction in life with both QoLIs presented sedentary group of HP and the highest dissatisfaction with mentioned QoLIs expressed seentarye group of PwDs.

III. DISCUSSION

The aim of our research was first of all to evaluate subjective satisfaction with 24 QoLIs as well as the overall QoL scores within three main groups of sedentary living population with different health status. Furthermore we compared the satisfaction with QoLIs as well as an overall QoL within healthy population, population with non-communicable diseases and population with disabilities. The total S.QUA.L.A. score showed the highest QoL level in HP with sedentary behaviour (2.418 points of total S.QUA.L.A score), than in PwDs (2.530 points of total S.QUA.L.A score) and the lowest QoL level declared sedentary population with NCDs with 2.553 total points.

Subjective quality of life analyses showed the highest life satisfaction in sedentary living HP who declared the highest satisfaction in their life with four QoLIs. PwNCDs declared the highest satisfaction in their life with three QoLIs and PwDs are the most satisfied only with one QoLI that did not exceed 2.0 points of the S.QUA.L.A. mean score. The results of Bendíková & Nemček [32] showed the highest satisfaction with life in actively living HP and the highest dissatisfaction with life in sedentary PwNCDs. On the other hand, subjective quality of life analyses of the current study showed the highest life dissatisfaction in the group of sedentary PwNCDs which was expressed by four QoLIs that exceed 3.0 points of the mean score, than in the group of HP who are dissatisfied with three QoLIs and group of sedentary living PwDs who expressed their highest dissatisfaction by two QoLIs. All three evaluated groups of sedentary population are coincidently the most satisfied in their life with children and the most dissatisfied with justice and political situation. No significant differences were found in overall QoL comparisons within three evaluated groups of sedentary population. In the above mentioned study of Bendíková & Nemček [32] were not found significant differences in overall QoL between active and sedentary HP but on the other hand, significant differences were found between active and sedentary PwNCDs. The results of Nemček [33] demonstrated significant differences between active individuals with disabilities and individuals leading sedentary lifestyle in all evaluated life satisfaction statements as well as in overall life satisfaction score.

Similar investigation [34] was focused on subjective well-being (SWB) assessment of the Slovak population (n=1107) without health status differentiation. The author found that Slovak people are the most satisfied in their life with social relations, family relations, food and home environment. The positive evaluation of SWB was represented in the same research also by QoLIs like children, hobbies in leisure, mobility and daily activities, rest in leisure and physical wellbeing. The results of this investigation very close correspondent to our findings concretely in groups of HP and PwNCDs. Negative SWB of the Slovak population in Nemček's research [34] pointed to political situation and justice and the highest number of the Slovak people took the neutral attitude on indicators beauty, art and religion. On the basis of these investigations we can see that people are in their life the most disappointed with justice and political situation without regard to their health status.

Sedentary PwDs of the current study are the most satisfied only with one QoLI (children) that did not exceed 2.0 points of the mean S.QUA.L.A. score. Another investigation of Nemček [35] showed that inactive people with physical disabilities (PD) are the most satisfied in their life with home environment, food and family relations and inactive people with hearing impairments of the same study present the highest satisfaction with children, love and family relations. Subjective quality of life analyses in the study of Nemček [35] displayed significantly higher satisfaction with QoLIs in the groups of actively living individuals with PD as well with hearing impairments comparing inactive.

Similarly Nemček & Kručanica [36] assessed the QoL in 152 participants who are deaf or hard of hearing (D/HH) and found that people with hearing impairments participating in sport regularly showed significantly higher satisfaction with physical health and the level of independence, psychological health and spirituality and presented significantly higher satisfaction with general health comparing the individuals with hearing impairment who lead sedentary lifestyle. The other hand significant differences in satisfaction between sedentary people with PD and sedentary population who are D/HH were found in 21 from 23 QoLIs [37]. Significantly higher satisfaction with 13 QoLIs was in the same study presented by sedentary people who are D/HH comparing sedentary people with PD but overall QoL score comparison displays no significant differences between people with PD and people who are D/HH with sedentary behaviour. Significantly higher overall QoL was presented in the same study actively living people who are D/HH comparing actively living people with PD [37].

IV. CONCLUSION

The overall S.QUA.L.A. score of the present study showed the highest QoL level in HP with sedentary behaviour and the lowest QoL level was declared by sedentary population with NCDs. Furthermore we discovered the highest satisfaction with QoLIs in group of sedentary living HP who showed the highest satisfaction with four QoLIs and the highest dissatisfaction in the group of PwNCDs who showed the highest dissatisfaction also with four QoLIs. All three evaluated groups of sedentary population are coincidently the most satisfied in their life with children and the most dissatisfied with justice and political situation. No significant differences were found in overall QoL comparisons within three evaluated groups of sedentary population. The biggest differences in satisfaction with QoLIs were found between HP and PwNCDs as well as between HP and PwDs where in both comparisons sedentary HP declared higher satisfaction with QoLIs in their life, than sedentary PwNCDs and PwD. On the basis of our results and many research investigations analysed in discussion we recommend to people without regard to their health status to change their sedentary behaviour and include some kind of physical activities in their leisure time because such participation can empower not only healthy population but significantly population with noncommunicable diseases and population with disabilities to set and attain goals and reach a higher QoL on their own terms [38, 39].

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