

Empirical verification of self-rated positive health (somatic dimension) in men with professional competence in the field of health education

Authors' Contribution:

- ✍ **A** Study Design
- 📁 **B** Data Collection
- 📊 **C** Statistical Analysis
- 📄 **D** Manuscript Preparation
- 📧 **E** Funds Collection

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Abstract

Background & Study Aim:

Self-rated health (SRH) is defined as a “summary statement about the way in which numerous aspects of health, both subjective and objective, are combined within the perceptual framework of the individual respondent”. The aim of this study is to address a question whether reports of young male students of physiotherapy concerning their positive health are concordant with indices based on recommended methods of measuring health?

Material & Methods:

Nine male students of physiotherapy (height: $=179.78 \pm 6.85$; weight: $=73.70 \pm 6.80$) declaring engagement in everyday ($n = 6$) or occasional ($n = 3$) physical activity completed. The profile of the sense of positive health and survival abilities indices (SPHSA). It comprises 15 indices of positive health (8 of somatic health – A, 4 of mental health – B, 3 of social health – C) and 8 indices of survival ability – D. The sense of intensity of particular indices (aspects A, B, C) is evaluated in the 1 to 5 scale, where: 1 very low, 2 low, 3 average, 4 high, 5 very high. Additional index “0” is reserved to aspect D. Empirical verification of participant's self-reports concerned only somatic health (with the exception of aerobic capacity). Men's height and weight (for BMI calculation), resting heart rate and blood pressure were measured. Then men performed 5 recommended motoric tests for measuring: anaerobic capacity; flexibility, muscle strength.

Results:

The correlation between reported and diagnosed average value of general index of somatic health of young men ($r = 0.31$) is not statistically significant. Reported and diagnosed values of general index of somatic health are concordant in 1 men. The remaining 8 men either overestimate ($n = 6$) or underestimate ($n = 2$) their somatic health. Difference between men's reported and diagnosed value of general index of somatic health, in the sense of the average result, is not statistically significant. Six out of nine men declared everyday physical activity. They significantly ($p < 0.05$) overestimated their diastolic blood pressure (highest reported value) and underestimate their flexibility (lowest reported value). Besides, they are inclined to overestimate considerably their systolic blood pressure and BMI and underestimate muscle strength.

Conclusions:

Empirical evidence justify recommendation SPHSA as useful tool for measuring people positive health both in clinical settings and populational studies.

Key words:

non-apparatus test • self-test • SPHSA questionnaire

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INTRODUCTION

Non-apparatus test – that motoric test (exercise endurance test) of the required reliability (accurate and reliable), which use does not require even the simplest instruments [36].

Self-test – *noun* a diagnostic test that you give yourself to determine your health, e.g. A blood-pressure test [37].

Health problem – *noun* any illness or chronic injury indicating that a person must Take precautions when carrying out particular activities [37].

Conditioning – *noun* the work or programme used to bring somebody or something to a good physical state [37].

Performance – *noun* the level at which a player or athlete is carrying out their activity, either in relation to others or in relation to personal goals or standards [37].

Self-rated health (SRH) is defined as a “summary statement about the way in which numerous aspects of health, both subjective and objective, are combined within the perceptual framework of the individual respondent” [1]. Accuracy of this definition is confirmed by many empirical studies. Correlates of SRH belong to all dimensions of health distinguished by WHO [2]: somatic e.g. inflammatory markers [3], clinical characteristics of somatic disorders [4]; mental e.g. mental health problems [5], self-esteem [6]; social e.g. social interactions [7], ethnicity [8.]. There are available some hypothesis concerning how knowledge regarding health is organized and analysed by people and what is the base of this analysis: spontaneous self-assessment (self-test) or beliefs related to enduring self-concept of health [9-16].

There is week correlation between patient’s SRH and physician-rated health (PRH). In study of DeSalvo & Muntner [17] SRH and PRH were concordant only in 53.8% of cases; a little bit higher values were recorded by Gest et al.(68 %). This discordances are considered to stem from: differences between patients and physicians regarding appreciation of the same variables in the assessment of health status, influence of patient’s personality (optimism, pessimism etc.) on their SRH or the fact that SRH may encompass more information than PRH [18, 19].

Analysis of these revealed relations between SRH and other health indicators and health self-perception models analysis facilitate differentiation two main criterions conditioning SRH accuracy: conscious self-observation concerning sensory experiences from entire body and interaction with environment (physical, mental and social performance), having knowledge about appropriate selection information obtained from self-observation and their interpretation (in brief: education). Since that, it is justified to consider health specialists (physicians, nurses, physiotherapist etc.) as a people who should have more accurate SRH than other populations. Consequently, validation of SRH in these occupational groups may be considered as important additional frame of reference (external validity) for studies conducted in other populations. It is related to e.g. sensitivity and specificity of SRH.

The aim of this study is to address a question whether reports of young male students of

physiotherapy concerning their positive health are concordant with indices based on recommended methods of measuring health?

MATERIAL AND METHODS

Participants

Nine male students of physiotherapy (height: =179.78±6.85; weight: =73.70 ±6.80) declaring engagement in everyday or occasional physical activity completed.

Study design

The profile of the sense of positive health and survival abilities indices (SPHSA) [20]. It comprises 15 indices of positive health (8 of somatic health – A, 4 of mental health – B, 3 of social health – C) and 8 indices of survival ability – D. The sense of intensity of particular indices (aspects A, B, C) is evaluated in the 1 to 5 scale, where: 1 very low, 2 low, 3 average, 4 high, 5 very high. Additional index “0” is reserved to aspect D. SPHSA include also 8 questions referring to subject’s earlier experiences related to: safe falling, self-defense, martial arts, life-saving skills in the water, first aid, survival, uniformed services and scouting.

Empirical verification of participant’s self-reports concerned only somatic health (with the exception of aerobic capacity). Men’s height and weight (for BMI calculation), resting heart rate and blood pressure were measured. Than men performed 5 recommended motoric tests for measuring: anaerobic capacity (30-sec Burpee test); flexibility (non-apparatus flexibility test), muscle strength (standing long jump, 10-sec press-ups, 30-sec sit ups) [21].

Statistical analysis

Statistical analysis involved the arithmetic mean, proportion indicator (%) and also calculating correlation coefficient between values and tests for significance of the differences between means (reported versus diagnosed values of indices).

RESULTS

The correlation between reported and diagnosed average value of general index of somatic health of young men ($r = 0.31$) is not statistically significant (Figure 1).

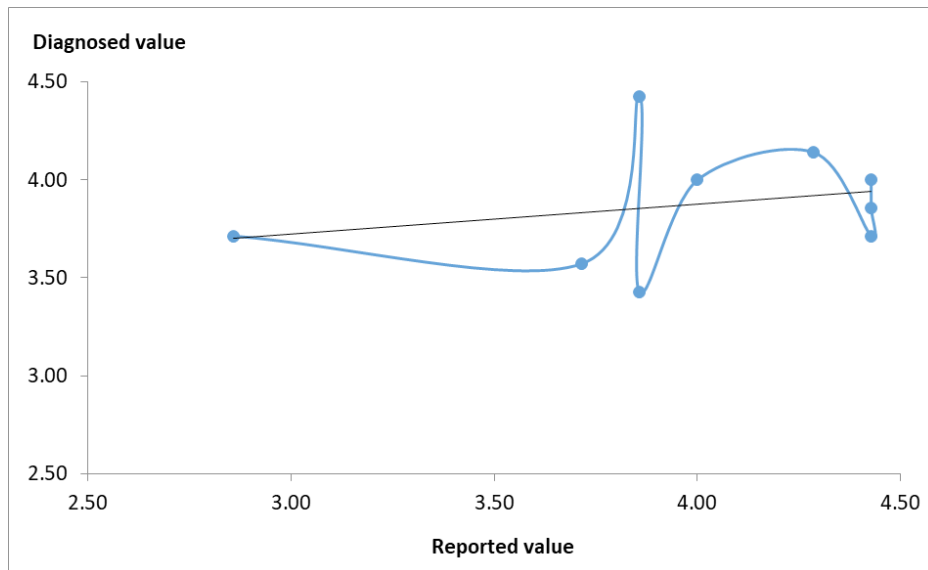


Figure 1. The relationship between reported and diagnosed average value of general measure of somatic health of 9 young men (relatively to regression line): $r = 0.31$ ($p > 0.05$).

Reported and diagnosed values of general index of somatic health are concordant in 1 men (code M1). The remaining 8 men either overestimate ($n = 6$) or underestimate ($n = 2$) their somatic health (Figure 2). Difference between men’s reported and diagnosed value of general index of somatic health, in the sense of the average result, is not statistically significant.

Six out of nine men (66.66%) declared everyday physical activity. They significantly ($p < 0.05$) overestimated their diastolic blood pressure (highest reported value) and underestimate their flexibility (lowest reported value). Besides, they are inclined to overestimate considerably their systolic blood pressure and BMI and underestimate their muscle strength (Figure 3).

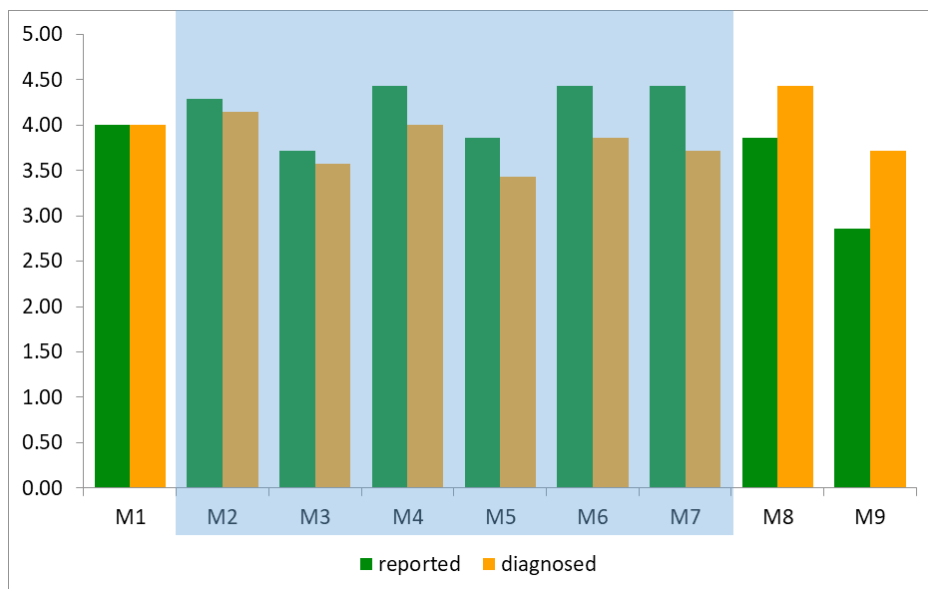


Figure 2. Reported (r) and diagnosed (d) values of general index of somatic health of young men ($n = 9$). Subsets of results: M1 concordance; M2 to M7 overestimation; M8, M9 underestimation.

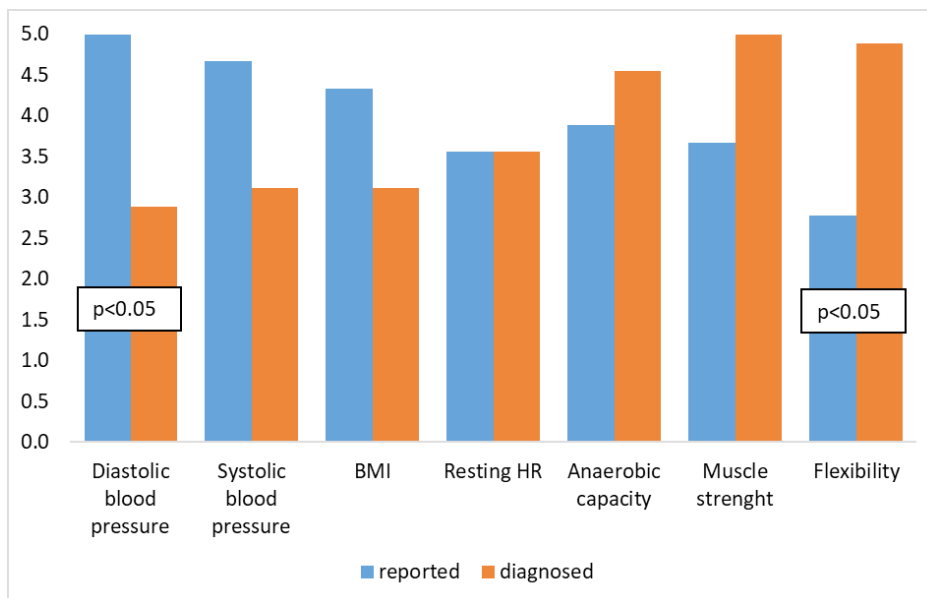


Figure 3. Reported (r) and diagnosed (d) values of detailed indices of somatic health of young men declaring everyday physical activity (n = 6). Ordinal variable: declared intensity of particular indices of somatic health (from the highest to the lowest).

Although man with code M1 (declaring occasional physical activity) has concordant reported and diagnosed average value of general index of somatic health, he assessed accurately intensity only 1 out of 7 its detailed indices (anaerobic capacity). He overestimated his BMI and blood pressure (both systolic and diastolic) and underestimated resting heart rate, muscle strength and flexibility (Figure 4).

Man with code M5 declaring everyday physical activity hasn't concordant reported and diagnosed average value of general index of somatic health ($x_r = 3.857, x_d = 3.429$ resp.), but he assessed accurately intensity 4 out of 7 its detailed indices (BMI, resting heart rate, anaerobic capacity and muscle strength). He overestimated his blood pressure (both systolic and diastolic) and underestimated flexibility (Figure 5).

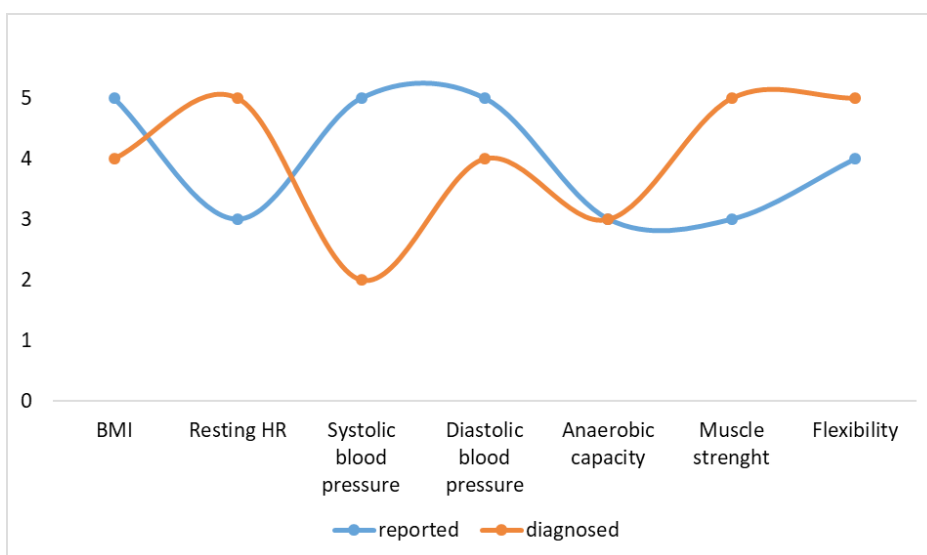


Figure 4. Profile of reported (r) and diagnosed (d) values of detailed indices of somatic health of young man (code M1).

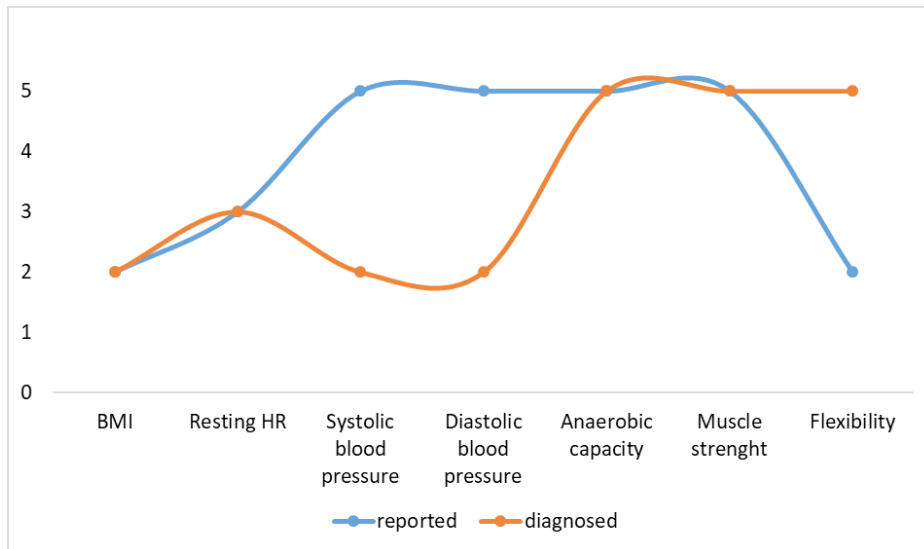


Figure 5. Profile of reported (r) and diagnosed (d) values of detailed indices of somatic health of young man (code M5).

DISCUSSION

Generally, the concordance between reported and diagnosed value of detailed indices of somatic health among all men the most often occurred with regard to resting heart rate. In case of systolic blood pressure and flexibility there were only discordances (Figure 6). Overestimations between reported and diagnosed values relate mainly to blood pressure (both systolic and diastolic) and BMI whilst underestimations to aerobic capacity, muscle strength and flexibility (Figure 7).

It's trivial (but important in case of SPHSA) mathematical statement, that the same average value may be obtained by different sets of particular values. Two people may have identical value of general index of somatic health (e.g. 4,000) what doesn't necessarily mean also concordance of values concerning particular indices. It refers to all types type of comparisons: intergroup (reported vs reported or diagnosed vs diagnosed) or intragroup (reported vs diagnosed). One should be aware of this information loss. In some cases too general level of analysis

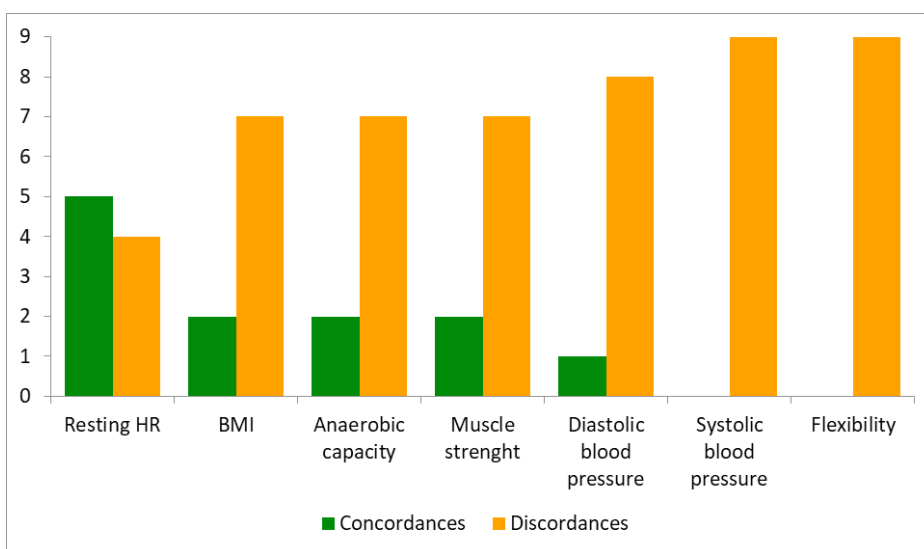


Figure 6. Amount of concordances (C) and discordances (D) between reported and diagnosed values of detailed indices of somatic health of young men (n = 9). Ordinal variable: amount of concordances.

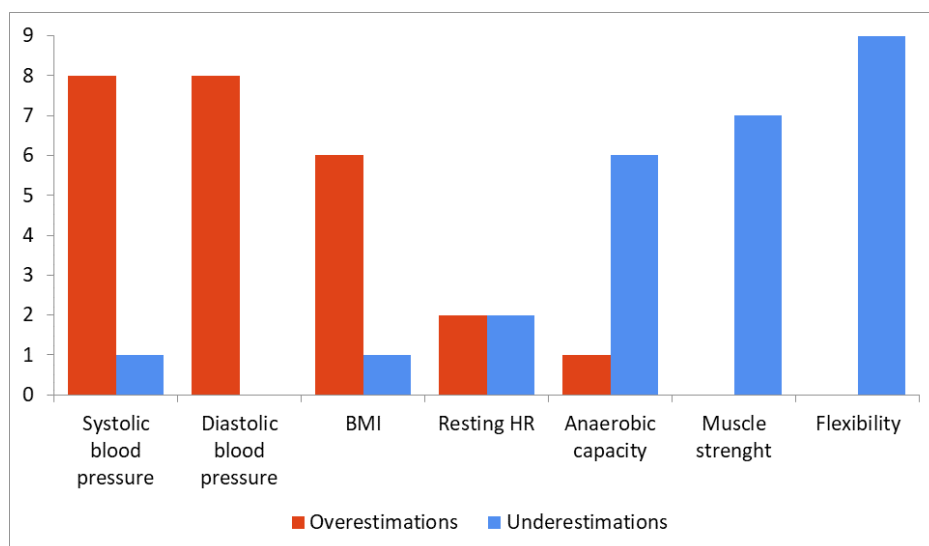


Figure 7. Amount of overestimations (O) and underestimations (U) among young men (n = 9) concerning detailed indices of somatic health. Ordinal variable: amount of overestimations.

may have influence on interpretation of explored phenomena e.g. overlooking of important details. Results of this study is good example of this potential risk. Researchers are aware of this kind of problems and has already provided some methodological recommendations making easier avoiding other interpretative mistakes [22]. Unfortunately, the current results of studies using the SPHSA questionnaire concern only the declared sense of positive health indicators and survival abilities [20, 23-26].

Part of SPHSA referring to positive health (aspects A, B, C) is more expanded version of single item question about general self-rated health (SRH), which is commonly accepted and often applied health measure in a long time [27]. Both measures differs as to method of obtaining the most general statement about one's health perception. In framework of SPHSA it is done indirectly by averaging values of particular, predetermined indices as opposed to answering question about general SRH where it is done directly. Since SPHSA is based on limited (modifiable) set of indices so data analysis is simplified. This process is more difficult and require much more assumptions in case of question about SRH since it do not impose any restrictions on people as to information selection and evaluation. According to framework of SPHSA people assess only sense of intensity of particular indices without their referencing to accepted medical norms (it's role of researcher or health specialist) whereas such evaluation is an indispensable element included in answer to question about general SRH.

Although people's general self-reports about their health "...are collected in major national and international surveys" [11], this data seems to have limited application in clinical settings. Single item question about general self-rated health (SRH) has no available corresponding more objective measure. Furthermore, people's general self-reports about their health are difficult to reconstruct by set of more objective indices [28, 29]. It may stem from that people's SRH include some unique information about their health (It is justified as SRH is an independent mortality predictor [30]). However, knowledge about that puzzling element of SRH won't have serious practical application until researches understand its cause. The basic question is: what adjustments does treatment of any disease (e.g. cardiovascular disease) require in case of two patients who have the same values of all more objective indices of health but different SRH (very good vs very poor)?

SPHSA usage, obversely, allow for orientate people's efforts directed at health promotion. Since student of physiotherapy with code M5 have optimal level of flexibility (diagnosed value: 5 so if he were e.g. visiting of physiotherapist, he would be only informed about his underestimation (reported value: 2, and assured that level of flexibility is good and encouraged to measuring flexibility regularly (e.g. twice a month). Regular self-measuring of blood pressure would be recommended to him since he assessed too optimistically both his systolic (reported value: 5, diagnosed value: 2 and

diastolic (reported value: 5, diagnosed value: 2 blood pressure. Physiotherapist would also suggest scheduling a cardiologist appointment if patient declared that such values of blood pressure (141/73) occurs more often.

SPHSA is also an alternative for other available complex health questionnaires. The SPHSA trait which may be considered as disadvantage and potentially limits its applicability is that completing this questionnaire often requires thinking about particular health indices often expressed in abstract terms. One can argue that it's easier to evaluate limitation stemming from health concerning "Lifting or carrying groceries" (SF-36) [31] than strength in general (SPHSA). Similar objection regards asking for declaring „sense of intensity" of particular health indice. Author of this article has experienced this kind of difficulties in applying SPHSA in group of elderly people while assisting in research conducted by physiotherapy student which results are published in her master's thesis [32]. However, this doubts pertain to all questionnaires, since researcher or health specialist using any of them assume (implicitly or explicitly) that person who will completing it must have an appropriate mental competences to do it. If not, questionnaire have to be adjusted. It is related to interesting methodological issue concerning questionnaires development. Should it be driven "top-down" (verification of general conception in clinical settings) or "bottom-up" (generalization of information obtained from clinical

settings into general conception)? Although there are available recommendations concerning development of patient-reported outcomes (PROs) instruments [33], it seems that creation of reliable questionnaire require using elements of both paths.

One of the main advantages of SPHSA is, that it measures not only people's health but also survival ability (aspect D) which are closely related but it's not well emphasised. Assessing survival ability significantly supplements traditional patient's independence evaluation based on Activities of Daily Living ADL e.g. transfer (bed to chair and back), bathing, toilet use, walking stairs, [34] and Instrumental Activities of Daily Living IADL: ability to use telephone, food preparation, housekeeping etc. [35]. Skills related to safe fall, first aid, precision before and during activity, maintain body balance regardless of disturbance are usable regardless of age and place of living. Having skills concerning swimming ability, lifesaving skills in water, survival abilities in solitude are not indispensable for everyone but it doesn't mean that they are unnecessary.

CONCLUSIONS

Empirical evidence justify recommendation SPHSA as useful tool for measuring people positive health both in clinical settings and populational studies.

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