ORIGINAL ARTICLE

Reliability of the Mental and Social Health (M&SH) Questionnaire – test-retest adult men and women

Authors' Contribution:
A Study Design
B Data Collection
C Statistical Analysis
D Manuscript Preparation
E Funds Collection

Robert Bąk [1ABCDE], **Bartłomiej Jan Barczyński** [2ABCD], **Leon Andrzej Krzemieniecki** [3ABCD]

[1] College of Medical Sciences, Institute of Physical Culture Studies, University of Rzeszow, Rzeszow, Poland
[2] Archives of Budo, Warsaw, Poland
[3] EKO-AGRO-FITNESS Prof. Roman M. Kalina, Piwniczna-Zdrój, Poland

Received: 08 September 2019; **Accepted:** 13 December 2019; **Published online:** 31 December 2019

AoBID: 13396

Abstract

Background and Study Aim: Estimation of mental health and even more so of social health, in a simple but reliable manner in particular, is one of the most difficult methodological challenges. In our opinion, the authors of M&SH Questionnaire have been equal to this challenge The purpose of the work is to empirically verify the reliability of the M&SH Questionnaire.

Material and Methods: The M&SH Questionnaire consists of 12 statements (or questions) informing about hypothetical situations with the respondent participation. Mental health (MH Index) is estimated based on six statements: aggressiveness (arithmetic mean of the result of 2 descriptive/verbal simulations); one sense of fear; one stress coping skills; tolerance (arithmetic mean of the result of 2 simulations). Social health (SH Index) based on: respecting "fair play" rules (arithmetic mean of the result of 2 descriptive/verbal simulations); respecting supreme values ((arithmetic mean of the result of 3 simulations); responsibility (one simulation). The result of each respondent's declaration is based on five-point scale (conventional points, which simplifies statistical analysis): 5 (declared answer indicates a very high level of mental and/or social development); 1 (the opposite of such a conclusion); 4, 3, 2 remain in the middle. The test-retest method was used 14 days apart.

Thirty-one adults (21 females, 10 males) aged 26.48 ±3.17 years old, who study extramural humanities and social studies, were tested.

Results: The M&SH Questionnaire reliability confirmed the following very highest and highest correlations (test ÷ retest) of empirical indicators: r = 0.902 for kindness; r = 0.858 for aggressiveness (when the simulated attack is directed at the respondent); r = 0.853 for sense of fear; r = 0.815 for stress coping skills; r = 0.803 for responsibility; r = 0.797 for RSV Index of M&SH. Mental health profiles are highly correlated between test retest (r = 0.772) and also social health r = 0.770.

Conclusions: The test-retest results are empirical evidence that the M&SH questionnaire meets the methodological criteria of the tool intended for simulation tests. The recommendation of M&SH for research on youth (from 16 years old) and adults is justified, especially as part of the application the Profile of Sense of Positive Health and Survival Abilities (SPHSA).

Key words: Delphi method • non-apparatus test • quasi-apparatus test • simulation tests

Conflict of interest: Authors have declared that no competing interest exists

Ethical approval: The study was approved by the local Ethics Committee

Provenance & peer review: Not commissioned; externally peer-reviewed

Source of support: Departmental sources

Author's address: Bartłomiej Barczyński, Archives of Budo, Aleje Jerozolimskie 125/127 lok. 601B, 02-017 Warsaw, Poland; e-mail: barczynski@wp.pl

INTRODUCTION

Estimation of mental health and even more so of social health, in a simple but reliable manner in particular, is one of the most difficult methodological challenges. In our opinion, the authors of M&SH Questionnaire (Kalina and Kondzior [1]) have been equal to this challenge. The argumentation that contemporary society focused on attractive aspects of the Internet and technological innovations lack motivation and patience to complete psychological tests that require time and focus is convincing. Kalina and Kondzior [1] aptly emphasise that a cognitive aspect is an equally important obstacle. Even in countries with the highest Gross Enrolment Ratio (GER) or Gross Enrolment Index (GEI) it is reported that society has troubles reading even the simplest texts with understanding. In our opinion, it is accurate to suggest that it is practically impossible to commonly use, for example, Buss-Durkee (BD-100) test that has been popular since the 1950s and measures aggressiveness based on the respondent's answers to 100 questions [2] as part of a comprehensive assessment of mental health. Aggressiveness is only one of the recommended mental health indicators [3-7].

According to the authors' intentions [1], the M&SH Questionnaire is a simple tool (method) used to measure mental and social health in order to verify the profile of Sense of Positive Health and Survival Abilities [8] that was in advance determined based on declaration of a single respondent. Based on the current application of the SPHSA questionnaire from 2012 to 2016, scientists analysed profiles of sense of positive health and survival abilities declared by 741 adults who were occasionally active and 141 adults who were active every day [9]. It was not found that physical activity differentiated the declared profiles of individual homogeneous groups due to professional qualifications.

Only Dobosz [10, 11] has empirically verified somatic dimension of self-rated positive health in adult women and men. He found that compliance of profiles of declared somatic health indicators and indicators verified based on recommended tests is low (women 33%; man 11.1%). These conclusions are important premises for those who study these phenomena and for entities monitoring all dimensions of positive health and a factor the importance of which cannot be overestimated, namely survival abilities.

This factor distinguishes the SPHSA method from known health monitoring recommendations. In our opinion, this method pushes the limits of fixed understanding of key terms (see glossary): **health promotion** [12], **healthcare** [13], **public health** [13] and **health service planning** [14]. The following questions are only seemingly rhetorical: can a person who cannot swim be considered healthy in all dimensions?; Is a person who sustains a complex bodily injury after an unintentional fall (leaving aside over 450,000 citizens of the world who die of such causes [15, 16]), only because neither parents nor school have taught them to break the collision of their own body with the ground, considered healthy?; Can a person who cannot effectively counteract violence, brutal physical aggression in particular, be considered healthy, because media find more attractive (as far as marketing is concerned) to promote neo-gladiatorship, i.e. various bloody types of MMA (mix martial arts) [17], instead of teaching citizens how to effectively self-defence? etc. The purpose of the work is to empirically verify the reliability of the M&SH Questionnaire.

MATERIAL AND METHODS

In the SPHSA questionnaire evaluation of **mental health** (dimension B) is based on four empirical variables: aggressiveness; sense of fear; stress coping skills; tolerance, while evaluation of **social health** (dimension C) is based on three variables: respecting „fair play" rule; respecting supreme values; responsibility [8].

Therefore the M&SH Questionnaire consists of 12 statements (or questions) informing about hypothetical situations with the respondent participation. Mental health (MH Index) is estimated based on six statements: aggressiveness (arithmetic mean of the result of 2 descriptive/verbal simulations); sense of fear (one simulation), stress coping skills (one simulation), tolerance (arithmetic mean of the result of 2 simulations). Social health (SH Index) based on: respecting "fair play" rules (arithmetic mean of the result of 2 descriptive/verbal simulations); respecting supreme values (arithmetic mean of the result of 3 descriptive/verbal simulations); responsibility (one simulation). The result of each respondent's declaration is based on five-point scale (conventional points, which simplifies statistical analysis): 5 (declared answer indicates a very high level of mental and/or social development); 1 (the

Health promotion is the process of enabling people to increase control over and to improve their health (...) Health promotion represents a comprehensive social and political process, it not only embraces actions directed at strengthening the skills and capabilities of individuals, but also action directed towards changing social, environmental and economic conditions so as to+ alleviate their impact on public and individual health. Health promotion is the process of enabling people to increase control over the ***determinants of health*** and thereby improve their ***health.*** Participation is essential to sustain health promotion action [12, p. 1-2].

Healthcare – *noun* the provision of medical and related services aimed at maintaining good health, especially through the prevention and treatment of disease [13].

Public health – *noun* the study of illness, health and disease in the community ⇨ ***community medicine*** [13].

Health service planning – balancing the needs of a community, assessed by such indices as mortality, morbidity, and disability, with the resources available to meet these needs in terms of medical manpower (ensuring the numbers in training grades meet but do not exceed future requirements for career grades) and technical resources , such as hospitals (capital planning), equipment, and medicines. Success is measured by a process ***medical audit in*** which the use of resources is weighed against the efficiency of their use (e.g. treatments undertaken, bed occupancy) and effectiveness in terms of outcome (e.g. deaths, complications, quality of life, return to work) [14, p. 296].

Mental health – *noun* the condition of someone's mind [13].

Social health – is defined as: how a person gets along with other people; a person's level of support from people and institutions around them; how well a society does at offering every citizen the equal opportunity to obtain access to the goods and services critical to being able to function as a contributing member of society. An example of social health: a) is the amount of interaction

opposite of such a conclusion); 4, 3, 2 remain in the middle. The authors of the MSH questionnaire based simulations and assessment criteria on the results of the Delphi method [1]. The test-retest method was used 14 days apart.

Participants

Thirty-one adults (21 females, 10 males) aged 26.48 ±3.17 years old, who study extramural humanities and social studies, were tested.

Statistical analysis

The estimation of empirical variables (arithmetic mean, sample standard deviation, etc.), measure of skewness (g1) and measure of kurtosis (g2). Hypothesis testing (significance test – independent correlation coefficients). Correlation coefficient between pairs of specified variables (test re-test).

RESULTS

Mental health profile (dimension B)

Mental health profiles (MH Index) are highly correlated between test re-test (r = 0.772). During the test and re-test, the average MH Index (respectively: 3.044; 3.181) – total number of points amounted to 12.18 and 12.73 (with theoretical distribution from 4 to 20 conventional points). The MH Index (i.e. the average result) ranged from 1.875 and 3.875 (with theoretical distribution from 1 to 5) and from 2.000 and 4.00 in case of initial tests and tests performed after 14 days (re-test) This means that mental health of test subjects is low and high (Table 1 and 2).

Individuals with average results are most frequently represented (67.74%). Hence, negative skewness (g1 = −0.68) can be observed after 16.13% of individuals with high level have been taken into account (Table 1). The distribution of these indicators is comparable in case of re-test: 67.74%) % and 19.35%, respectively, with g1 = −0.42) (Table 2).

The highest detailed test-retest indicators are associated with the following simulated situations: physical attack on a respondent (r = 878) (Table 3); circumstances that require spending the night alone in a hostile environment (r = 0.853). The lowest indicator was r = 0.667 – the second of simulated situations diagnosing "tolerances" (Table 4). The correlation (test re-test) of the sense of fear and stress coping skills indicators is high (Table 5).

Table 1. Estimation of general mental health indicators (test).

Statistic indictor	Variables: simulated situations described				MH Index
	Aggressiveness [Index]	Tolerance [Index]	Sense of fear	Stress coping skills	
X	**3.032**	**3.597**	**2.065**	**3.484**	**3.044**
SD	1.01	1.07	1.06	1.29	0.48
Min	1	1.5	1	1	1.875
Max	4.5	5	4	5	3.875
g1	−0.67	−0.18	0.58	−0.31	−0.68
g2	0.15	−1.02	−0.89	−1.40	0.22

Table 2. Estimation of general mental health indicators (re-test).

Statistic indictor	Variables: simulated situations described				Index MH
	Aggressiveness [Index]	Tolerance [Index]	Sense of fear	Stress coping skills	
X	**3.242**	**3.903**	**2.226**	**3.355**	**3.181**
SD	1.06	0.96	1.09	1.36	0.56
min	1	2	1	1	2
max	5	5	4	5	4
g1	−0.55	−0.46	0.35	0.07	−0.42
g2	−0.08	−0.81	−1.14	−1.61	−0.72

a person has with their community; b) for a society is laws and regulations being applied to all citizens equally; c) is public access to the decision-making processes; d) is when an individual feels the support offered by being a part of the society, causing him to feel the encouragement to better himself through personal growth such as increased education or the development of a talent [21, see also 22].

Gross Enrolment Ratio (**GER**) or **Gross Enrolment Index** (**GEI**) – is a statistical measure used in the education sector, and formerly by the UN in its Education Index, to determine the number of students enrolled in school at several different grade levels (like elementary, middle school and high school), and use it to show the ratio of the number of students who live in that country to those who qualify for the particular grade level. The United Nations Educational, Scientific and Cultural Organization (UNESCO), describes «Gross Enrolment Ratio» as the total enrolment within a country «in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education» [23].

Simulation – caused in model an event, which under some circumstances is similar to the event occurring in examined real object [24].

The Delphi method (Delphi technique) – a method of group decision-making and forecasting that involves successively collating the judgments of experts [25].

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 [18].

Quasi-apparatus test – can be conducted with simple instruments (a stopwatch, a ruler, a measuring tape, etc.) [18].

Table 3. Estimation of detailed aggressiveness indicators and M&SH aggressiveness (test and re-test).

Statistic indictor	Simulated situations described				Aggressiveness Index of M&SH [arithmetic mean of the result of 2 descriptive simulations]	
	If another person was physically assaulted in your presence, then:		When someone physically attacks me, it:			
	test	re-test	Test	re-test	test	re-test
X	**2.290**	**2.613**	**3.774**	**3.871**	**3.032**	**3.242**
SD	1.42	1.54	1.45	1.36	1.01	1.06
min	1	1	1	1	1	1
max	4	5	5	5	4.5	5
g1	0.34	0.06	−1.11	−1.28	−0.67	−0.55
g2	−1.88	−1.87	−0.20	0.43	0.15	−0.08
r	**0.708**		**0.878**		**0.793**	

Social health profile (dimension C)

Social health profiles (SH Index) are highly correlated between test re-test (r = 0.770). During the test and re-test, the average SH Index (respectively: 3.762; 3.719) – total number of points amounted to 11.285 and 11.73 (with theoretical distribution from 3 to 15 conventional points). The SH Index (i.e. the average result) ranged from 2.667 and 4.772 (with theoretical distribution from 1 to 5) and from

Table. 4. Estimation of detailed tolerance indicators and M&SH tolerance index (test and re-test).

Statistic indictor	Simulated situations described				Tolerance Index of M&SH [arithmetic mean of the result of 2 descriptive simulations]	
	On every important issue:		In contentious issues regarding faith, value system, political views, education, etc.:			
	Test	re-test	test	re-test	test	re-test
X	**3.39**	**3.65**	**3.81**	**4.16**	**3.597**	**3.903**
SD	1.38	1.33	1.40	1.32	1.07	0.96
min	1	1	2	2	1.5	2
max	5	5	5	5	5	5
g1	−0.03	−0.47	−0.49	−1.06	−0.18	−0.46
g2	−1.44	−1.03	−1.74	−0.84	−1.00	−0.81
r	**0.693**		**0.667**		**0.680**	

Table 5. Estimation of sense of fear and stress coping skills indicators (test and re-test).

Statistic indictor	Sense of fear		Stress coping skills	
	Simulated situations described			
	In circumstances that require to spend the night alone in an unfriendly environment:		In the most difficult situations (physical or economic threat, strong psychological pressure, etc.):	
	Test	re-test	test	re-test
X	**2.065**	**2.226**	**3.484**	**3.335**
SD	1.06	1.09	1.29	1.36
min	1	1	1	1
max	4	4	5	5
g1	0.58	0.35	−0.31	0.07
g2	−0.89	−1.14	−1.40	−1.61
r	**0.853**		**0.815**	

Table 6. Estimation of general social health indicators (test).

Statistic indictor	Variables: simulated situations described			SH Index [arithmetic mean of the result of 3 variables]
	respecting "fair play" rules [FP Index]	respecting supreme values [RSV Index]	Responsibility	
X	**3.952**	**4.269**	**3.065**	**3.762**
SD	0.86	0.56	1.18	1.73
Min	1.5	3	1	2.667
Max	5	5	5	4.722
g1	−0.81	−0.62	0.00	−0.23
g2	0.38	−0.80	−1.21	−0.86

Table 7. Estimation of general social health indicators (re-test).

Statistic indictor	Variables: simulated situations described			SH Index [arithmetic mean of the result of 3 variables]
	respecting "fair play" rules [FP Index]	respecting supreme values [Index RSV]	Responsibility	
X	**4.048**	**4.301**	**2.806**	**3.719**
SD	0.79	0.59	1.14	1.78
Min	1.50	3.00	1.00	2.167
Max	5	5	5	4.772
g1	−1.48	−0.68	0.70	−0.30
g2	2.44	−0.38	−0.86	0.28

2.167 and 4.772 in case of initial tests and tests performed after 14 days (re-test) This means that mental health of test subjects is low and high (Table 6 and 7).

Correlation coefficients of fair play indicators show a moderate correlation between the test and re-test (r from 0.591 to 0.690) (Table 8). As far as the indicators making up the RSV Index (respecting supreme values) are concerned, the lowest correlation was observed in case of test-retest results diagnosing the tendency of the examined person to present the facts truthfully (r = 0.427). Other indicators diagnosing kindness and courage (that require the respondent to be ready to take the risk while rescuing a drowning person) testify to the very high and high stability of these traits: r = 0.902 and r = 0.850, respectively; while RSV Index of M&SH (Table 9).

Table. 8. Estimation of detailed respecting "fair play" rules indicators and FP Index of M&SH (test and re-test).

Statistic indictor	Simulated situations described				FP Index of M&SH	
	In order to achieve a relatively long-term effect, you solve the conflict in a way:		In sports fight with my participation:			
	Test	re-test	test	re-test	test	re-test
X	**3.871**	**4.000**	**4.032**	**4.097**	**3.952**	**4.048**
SD	1.31	1.29	0.84	0.87	0.86	0.79
Min	1	1	2	1	1.5	1.5
Max	5	5	5	5	5	5
g1	−0.70	−0.89	−1.16	−1.82	−0.81	−1.48
g2	−1.00	−0.66	1.62	5.11	0.38	2.44
r	**0.690**		**0.591**		**0.641**	

Table 9. Estimation of detailed respecting supreme values indicators and RSV Index of M&SH (test and re-test).

Statistic indictor	Kindness		Truth		Courage		RSV Index of M&SH [arithmetic mean of the result of 3 descriptive simulations]	
	Simulated situations described							
	When anyone needs support or help:		In life situations I present facts to others:		Would you jump into the water to save the drowning man if you could swim?			
	test	re-test	Test	re-test	test	re-test	test	re-test
X	**4.258**	**4.335**	**4.161**	**4.258**	**4.387**	**4.290**	**4.269**	**4.301**
SD	1.09	1.02	0.58	0.63	1.28	1.27	0.56	0.59
Min	2	2	3	3	1	1	3	3
Max	5	5	5	5	5	5	5	5
g1	−1.37	−1.60	−0.01	−0.25	−1.71	−1.53	−0.62	−0.68
g2	0.52	1.47	0.00	−0.51	1.15	0.75	−0.80	−0.38
r	**0.902**		**0.427**		**0.850**		**0.797**	

DISCUSSION

Test-retest results confirm the most general conclusion that the M&SH questionnaire [1] meets the methodological criteria of the tool used to verify evaluation of mental and social health of those who have in the past declared the sense of indicators recommended in SPHSA [8]. Accuracy of M&SH questionnaire is not discussed in this paper. In our opinion, this issue has already been examined by the authors of this questionnaire in an accurate and convincing manner [1].

We concur with Kalina and Kondzior [1] that the purpose of M&SH questionnaire has been precisely defined. It is not a tool recommended in clinical trials. This means that no one can draw any conclusions about mental health of a particular individual, and even more so about social health that is difficult to quantify based on only twelve descriptively described situations (circumstances), in which almost every person may find themselves (and some respondents are probably already familiar with such situations). All the more so that, in line with applicable paradigm, formulated assessments of social health basically abstract from an individual. Events related to a number of individuals (e.g. per 100,000 of persons from given population) are considered representative among indicators of social health; usually they are associated with certain pathology (extreme interpersonal aggression, poverty, alcoholism, drug addiction, robberies, etc.). If we accept innovative assumptions of the authors of M&SH Questionnaire, evaluation of mental health of a particular person without disregarding their social health defends itself against alleged absence of logic. The authors of M&SH Questionnaire [1] clearly indicate the recipient – the SPHSA Questionnaire [8].

Table 10. Estimation of responsibility indicators (test and re-test).

Statistic indictor	Simulated situations described	
	Regardless of the circumstances:	
	test	re-test
X	**3.065**	**2.806**
SD	1.18	1.14
Min	1	1
Max	5	5
g1	0.00	0.70
g2	−1.21	−0.86
r	**0.803**	

Reviewers of not only M&SH Questionnaire but also of SPHSA are probably able to provide numerous examples of more precise tools to measure recommended (in this method) indicators of all dimensions of positive health and survival ability. There are no rational premises to accept the conclusion that both SPHSA and M&SH Questionnaire are not useful in broadly understood health promotion, in particular. On the contrary, in our opinion, the basic advantages of the method and suggested tools used to verify declared profiles of sense of positive health and survival abilities include simplicity, availability, easy testing in nearly all conditions (even in an apartment or a garden, etc.).

The author of SPHSA and co-author of a method used to evaluate individual dimensions of positive

health and indicators that aptly facilitate the identification of factors determining increased likelihood of survival (staying healthy and often alive) bases his diagnostic process mainly on non-apparatus and quasi-apparatus tests [18-20].

We believe that our assessment of the reliability of the questionnaire based on test-retest method is not the last stage of the validation procedure. Providing the authors of the M&SH Questionnaire with a set of data collected by us may bring cognitive and methodological benefits in the future that cannot be overstated. The prospect of using the M&SH Questionnaire in studies aimed at verifying the complete SPHSA profile in relation to different social groups and persons of all ages is equally interesting.

CONCLUSIONS

The test-retest results are empirical evidence that the M&SH questionnaire meets the methodological criteria of the tool intended for simulation tests. The recommendation of M&SH for research on youth (from 16 years old) and adults is justified, especially as part of the application the Profile of Sense of Positive Health and Survival Abilities (SPHSA).

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Cite this article as: Bąk R, Barczyński BJ, Krzemieniecki LA. Reliability of the Mental and Social Health (M&SH) Questionnaire – test-retest adult men and women. Arch Budo 2019; 15: 321-327