

Measuring mental health: a new tool and its usefulness
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Abstract

Introduction

It has been shown that a variety of mental health states, such as anger, insatiability and lack of concentration which are not clinically diagnosable disease entities can occur among 'normal' individuals. Outcomes of those mental states such as violence, abuse, suicide and accidents have become a considerable health and socioeconomic burden.

Before designing interventions for mental health promotion and prevention of undesirable effects of poor mental health, the status of mental health of 'normal' individuals needs to be measured. Tools available for this purpose are scarce. The present study was undertaken to identify variables constituting mental health and to develop and validate a tool to measure mental health among apparently healthy individuals.

Methodology

Variables constituting mental health were identified by a panel of experts and 'Primary Mental Health Questionnaire' was developed. Content and consensual validity of the questionnaire were tested. Construct validity was tested against 100 qualitative in-depth interviews. It was administered on a representative sample of 447 residents to assess its usefulness and acceptability as a self-administered survey tool.

Results:

The questionnaire included a section on socio-demographic information and a section to assess mental health status. The panel of experts agreed on content and consensual validity. Paired sample correlation co-efficient for construct validity varied from 0.19 to 0.54 and were significant ($p < 0.05$). The questionnaire was understood well and accepted by all population groups on which it was administered. There was a response rate of more than 95% in the population survey.

Conclusions

Results warrant use of this tool, in its present form. Further validation and improvements will make this questionnaire more meaningful and useful for epidemiological and clinical surveys.

Introduction

Mental health is not merely the absence of mental illness (1). It has been shown that a variety of mental health states, not amounting to clinically diagnosable disease entities, can occur. These mental states can manifest as anger, insatiability, lack of concentration and

attachment to self, material and mental formations. As the mental state precedes and governs behaviour these mental states experienced by "normal" individuals are associated with many outcomes such as violence of all forms, child abuse, suicide, road traffic accidents and some psychiatric disorders (2).

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Such outcomes have become a considerable burden to individuals, families and governments. Globally, more than 1.2 million people die in road traffic crashes every year (3), domestic violence has become a public health problem world-wide (4) and in Sri Lanka (5). Risk factors for attempted suicides other than depressive illness constituted 51.3% of 396 cases studied in Sri Lanka (6); and 35.5% of Advanced Level students were reported to have committed violent acts in Kalutara, Sri Lanka(7).

In addition to these behaviours that are not diagnosable as clinical entities, the burden of known mental disease is also escalating. Global surveys conducted by WHO show that mental and neurological disorders currently form 11% of the world wide disease burden. By 2020, this burden is expected to rise to 14.6% (8).

Reducing this double burden can be of immense help to the progression of mankind. Before designing interventions the status of mental health of individuals who are not mentally ill, needs to be measured to describe its variability. It will help quantify promotion of mental health and prevention of mental ill health among apparently healthy individuals and communities by helping to design appropriate interventions.

Measuring subtle variation of the status of mental health among people who are not mentally ill can be more difficult than identifying minor psychiatric disorders. Various tools have been developed to recognize minor psychiatric illnesses (9, 10) claiming to measure mental health. Of those currently available the General Health Questionnaire 30 has some questions that measure mental health of people

who are not having major or minor psychiatric disorders (10). However, most questions are aimed at measuring symptoms of minor psychiatric disorders. Tools that measure mental health of normal people are very scarce. Hence, the present study was undertaken with the **objectives** of

1. Identifying variables constituting mental health and
2. Developing and validating a tool to measure mental health among apparently healthy individuals

Methodology

First stage: A literature review was done to identify the variables constituting mental health. This search was done among literature in psychiatry, psychology, mind and consciousness, contemplative neurosciences, spiritual health and mental health.

Second stage: the list of variables was circulated among a panel of five experts including contemplative neuroscience research scholars, psychiatrists, psychologists, community physicians and others to identify variables actually constituting mental health.

Third stage: a questionnaire was developed with the selected variables to identify the mental health status in relation to the selected variables.

Pretest

The questionnaire was administered among a batch of new entrants to a university to determine the average time taken to complete it and how meaningful the questions were to them. Cultural acceptability and feasibility to self administer was also examined.

Validation

Examination of selected variables was done by a panel of experts to ensure content and consensual validity of the tool being developed.

For further validation a construct was developed that a 'qualitative in-depth interview by trained interviewers is able to reveal the mental health status and the strength of its correlation with a self-administered questionnaire will indicate the validity of information collected by the self administered questionnaire'. Subsequently, qualitative interviews were conducted among a sample of 100 residents from a Medical Officer of Health area in the Gampaha District. The interview schedule was based on the variables in the questionnaire. In the same visit the questionnaire was administered to the same individuals who were interviewed a few minutes before to test the construct validity. Paired correlation coefficients were calculated for each pair of variables, interview and self administered. (11) Questions with very low correlation were removed from the questionnaire (Figure 1).

Population survey

The questionnaire was administered on a representative sample of 447 residents from the Gampaha District to assess its usefulness and acceptability as a self-administered survey tool.

Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo. Permission was obtained from the Regional Director of Health Services, Gampaha.

Results:

Variables of health

Thirty five variables were identified. Some of the variables appeared to overlap in meaning. Members of the panel who scrutinized the variables agreed that the following constituted mental health variables.

- Satisfaction, happiness, mood, stress, fear, anxiety, being unshaken, not angry, restless, temperament, attachment, non attachment, desires, greed, craving, worry, jealousy, suspicion, determination, aggression, disobedience, love, loving kindness, cruelty, tolerance, open mindedness, equanimity, personality, resilience, self awareness, likes and dislikes, self popularity, critical thinking, academic stress, key worry, refuge (family as a refuge), decision making, problem solving, skills, creativity, empathy and dealing with disagreement.

Classification of variables

Mental health variables can be classified into four main composite variables as healthy thoughts, unhealthy thoughts, consequential thoughts and general thoughts (Figure 1). Consequential thoughts occur as a result of the thought processes generated by healthy or unhealthy thoughts. The fourth category are the general thoughts that are not healthy, unhealthy or consequential but can be associated with any of them

Figure 1. Classification of variables constituting health *

Healthy thoughts	Unhealthy thoughts	Consequential thoughts	General thoughts
Contentment	Attachment ,	Stress	Temperament
Satisfaction	Desires	Fear	Tolerance
Happiness	Greed, craving	Anxiety	Open mindedness
Unshaken , not angry,	Jealousy	Restlessness	Determination
Non-attachment	Suspicion	Worry	Personality
Loving kindness	Love,	Aggression	Resilience
Kindness,	Cruelty	Academic stress	Critical thinking
Equanimity	Likes and dislikes	Key worry	Decision making
Self awareness		Refuge	Problem solving skills
Empathy			Creativity
Dealing patiently with disagreement			

*rhetoric meaning of some variables may not be mutually exclusive

The questionnaire

The questionnaire consisted of two parts (appendix 1). Part one included selected socio-demographic information. The second part included questions to assess the mental health status on a ten point scale. Selected positive health variables formed the list of variables used to develop questions. Variables like anger and worry were also included as they are known related consequential variables. The questionnaire was named 'Primary Mental Health Questionnaire (PMHQ)' considering that it measures primary aspects of mental health.

Pretest

Students understood the questions well. No queries were raised during answering the questions. It took approximately twenty minutes to complete the questionnaire.

Students varied in satisfaction about money, food and clothing with (31) 23%, (20)15%and (15) 11% marking

five or less in the ten point scale. Fifty one (38%) marked above five for their level of psychological stress. These differences were not associated with differences in the socio-demographic status (12, 13).

Population survey

There was a response rate of more than 95%. Results showed a similar pattern with the results of the pretest with the university students indicating a certain amount of reliability (14). Results of the population survey could be comparable in some aspects studied in other research. In a study conducted in Gampaha district in Sri Lanka 22.3% (89) of elders were unhappy and 21.5%(86) depressed (15). These percentages were comparable with results of corresponding variables of the present study.

Construct validity

The paired sample correlation coefficient and the significance (p value) of one hundred pairs of qualitative interviews and self administered questionnaires, are in Table 1. Values of coefficient varied from 0.19 to 0.54 and the correlations were significant ($p < 0.05$) in all except for two questions.

Discussion

The present research was conducted to identify mental health variables and to develop a tool to measure mental health among apparently healthy individuals. Commonly used terms to describe mental health in literature did not adequately explain the exact nature of variables. There was overlap of meaning of certain terms used to describe mutually exclusive variables. This difficulty was partially overcome by soliciting the help of a panel of experts in related disciplines to identify variables of health. However, it should be noted that the understood meaning of these terms can vary among different individuals. Most of these variables represent psychological issues of people who are not having mental illnesses thus enabling measuring the variations in mental status of normal people.

Some variables could not be used to construct questions as it was difficult to convert them to meaningful questions. Hence, only selected variables were used to develop the questionnaire. It was difficult to quantify a subjective feeling such as anger, contentment and happiness. However, the ten point visual analogue scale proved to be a reasonable solution to this problem.

The present tool measures contentment, compassion, self-control, happiness, need to improve mind and the levels of psychological stress. These aspects, except stress levels, are not measured in many other tools available (9,10). The present questionnaire has eleven questions in addition to socio-demographic data which makes it rapidly applicable in the community as well as in a hospital or general practitioner setting.

The present tool, as a self administered questionnaire, has a unique advantage in that it assures privacy and is likely to reduce social desirability bias as no interviewer is involved.

However this tool demands a level of literacy, more than just being able to read and write, when used as a self-administered questionnaire. As the literacy rate in Sri Lanka is as high as 92.6% among males and 89.7% among females (16) it is expected that this can be used in many settings in Sri Lanka

Correlation between interviewer collected data and self-administered data for validation has to be considered with caution regarding mental health. With an outsider, culturally, people in Sri Lanka tend to show more satisfaction and happiness to avoid stigma and claim a better social status than when alone. This can spuriously lower paired correlation coefficient. Hence, the method used for assessing construct validity may not be the best for this purpose. However, positive correlation indicates a certain level of validity. Test-retest reliability is a feasible and acceptable reliability test that can be done to strengthen the usefulness.

Table 1 Correlation between self assessed and interviewer assessed mental status (r= paired sample correlation coefficient)

		n	r	Sig. p value
Pair 1	Satisfaction about money available to spend	94	.502	.000
Pair 2	Satisfaction about food	97	.427	.000
Pair 3	Satisfaction about clothes	96	.507	.000
Pair 4	Willingness to help a person fallen by the road	100	.408	.000
Pair 5	How happy are you when a neighbour wins a lottery	100	.312	.002
Pair 6	How much do you want your child to become first in the class	96	.423	.000
Pair 7	Level of mental stress last week	99	.540	.000
Pair 8	How much happy were you during the last week	100	.376	.000
Pair 9	How much angry were you when you got angry last	98	.498	.000
Pair 10	How much worried are you about your future	99	.456	.000
Pair 11	How much happy are you about your past	100	.283	.004
Pair 12	How much can you love others including animals	98	.190	.061
Pair 13	How much will you be shaken in a tragic death of one your relative	97	.473	.000
Pair 14	How much can you be shaken if you wins a lottery of one million	98	.243	.016
Pair 15	How much could you concentrate on your work today	98	.210	.038
Pair 16	How much do you feel you need to develop your mind	99	.264	.008
Pair 17	How much effort did you take to improve your mind during last three months	99	.381	.000

* n is less than 100 in some pairs as some respondents refused to respond to those questions

The present tool shows acceptability among the general population. Validity and reliability should be further tested. In the absence of tools to measure the normal range of mental health the present tool may be used in community and clinic setting to measure aspects included in the tool in combination with other forms of assessment of health. It will be most useful in monitoring mental health promotion activities. Further research will be needed to assess its usefulness as a predictor of behaviour of individuals.

Conclusions

Results warrant use of this tool for measuring some aspects of mental health among 'normal' people. Further validation and improvements will make this questionnaire more meaningful and useful for epidemiological and clinical surveys.

Limitations of the tool

Interpretation of results should be done with caution as certain aspects of mental health status of normal people can vary rapidly than some other aspects. Those who are not literate enough to read should not be surveyed using a self-administered questionnaire. An interviewer may be used with some understanding of possible biases.

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Date	
Serial No	

Primary Mental Health Questionnaire

Do not write your name.
Please fill this questionnaire to the best of your ability.

Part one

Tick the number of the appropriate answer write where necessary

1. Age at last birth date years

2. Sex

Male	1
Female	2

3. Marital status

Never married	1	Currently married	2
Widowed	3	Divorced	4
Separated	5		

4. Religion

Buddhism	1	Christian/ Catholic	2
Hindu	3	Islam	4
Other	5		

5. Your occupation

6. Nearest post office

7. What of the following items do you have at home?

Bicycle	1	Motor cycle	2
Three wheeler	3	Car/ Van/ Cab	4
Other	5	None	6

Part two

Aim of part two is to understand how you feel about the following situations.

Please indicate your status of mind in relation to the given situations in the following ten point scale. For example: If you are very happy when a neighbor wins a lottery, but not extremely happy you can indicate it by circling number eight as follows.

How much can you be happy when a neighbor of yours wins a lottery?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely happy
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2.1. What is your level of satisfaction about the money you have, with you, to spend?

Not at all satisfied	1	2	3	4	5	6	7	8	9	10	Extremely satisfied
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2.2 What is your level of satisfaction with food you ate during the last five days?

Not at all satisfied	1	2	3	4	5	6	7	8	9	10	Extremely satisfied
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2.3. What is your level of satisfaction about clothes you have?

Not at all satisfied	1	2	3	4	5	6	7	8	9	10	Extremely satisfied
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2.4. How much can you put your mind to help a person fallen fainted by the side of a road?

Not at all	1	2	3	4	5	6	7	8	9	10	To the maximum
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2.5 How much can you be happy when a neighbor of yours wins a lottery?

Not at all	1	2	3	4	5	6	7	8	9	10	To the maximum
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2.6 How much mental stress did you feel during last week?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely
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2.7 How much angry were you when you got angry last?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely angry
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2.8 How much worried are you about your future?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely
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2.9 How much happy are you about your past?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely
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2.10 How much do you feel that you need to improve your mind?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely
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2.11 How much effort did you take to improve your mind during last three months?

Not at all	1	2	3	4	5	6	7	8	9	10	Extremely
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Thank you