

Development of Cognitive Index to Measure Health Status

Antara Dhargupta¹, Minati Sen², A. Goswami³ and D. Mazumder⁴.

1. Ph.D Scholar, 2. Reader and HOD, Dept. of Home-Science, Calcutta University, Kolkata, West Bengal. India.

3. Director, Directorate of Distance Education, University of Kalyani, Kalyani, W.B, India. 4. Reader and HOD, Deptt. of Agril. Statistics, B.C.K.V, Nadia, West Bengal, India.

Corresponding Author E-mail: antu1979@gmail.com

ABSTRACT

One hundred ninety items were initially constructed following the prescribed guidelines to develop the cognitive index for measuring health status with the help of Equal Appearing Internal Scales described by Thurstone (1928). The scores obtained from 40 judges out of 110 were computed and subjected to item analysis comprising of calculation of median and interquartile range. One statement for each of the eleven median values was selected. In the final selection, the index consisted of 22 items with smallest interquartile range within each value. The reliability of the health status index was tested by split-half and test-retest method. The co-efficient of correlation values were 0.93 and 0.93 respectively which were found to be significant at 1 percent level of significance. It was found that the health status index constructed was highly stable and dependable for measurement.

Key words : Health status; Cognitive;

Health is a form of freedom and disease needs to be understood in relation to how those experiencing it feel constrained in their freedom to pursue what they perceive as valuable. Canguilhem (1991) called health a “biological luxury”. According to the WHO definition, “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (Amick, Benjamin C, et.al. 1995). This notion of health as well as the quality of life approaches are examples of a positive definition of health – positive because health is described directly and not as the absence of disease. The biomedical model, according to which health pertains in the absence of disease, uses a negative definition. Christopher Boorse (1977) spelled out the philosophical content of the biomedical model in his article “Health as a Theoretical Concept” and defines the biomedical model as follows. “Health as freedom from disease is statistical normality of function, ie. the ability to perform all typical physiological functions with at least typical efficiency level.” (WHO, 1976). Boorse claims that his bio-statistical model is value-free and is able to define health only with respect to empirical knowledge of the operation of the organism. Health status of a person not only depends on his physical or biological conditions, it is also influenced by the different socio-economic, socio-psychological conditions and different communication factors. There are manifold approaches to measure the

health status of individual following clinical, para-clinical, anthropometric, diet-survey, etc. measurements. Simultaneously there is a need of instrument by which we can measure the health status of a community with the help of value judgments of each individual. In this context, an attempt has been made to develop a cognitive (Expression of beliefs, expectancy-value judgments) index to measure health status.

METHODOLOGY

An index is a set of items (questions) that structures or focuses multiple yet distinctly related aspects of a dimension or domain of behavior, attitudes, or feelings into a single indicator or score. They are sometimes called composites, inventories, tests, or questionnaires. Like scales, they can measure aptitude, attitude, interest, performance, and personality (Earl. R. Babbie, 2005).

The procedure for equal appearing interval scales described by L.L. Thurstone (1928) was used for developing the Health Status Index. The method of Equal Appearing Intervals starts like most every other scaling method—with the development of the focus for the scaling, because this is an undimensional scaling method. The description of this concept should be as clear as possible, the technical languages and acronyms are spelled out and understood so that the person (s) who are going to create the statements have a clear idea of what are trying to measure.

Collection of statements: As the first step, the items were collected on the basis of relevant literature, field extension personnel, subject specialists in the Extension Education, Home-Science and Food and Nutrition and researcher's own experience. A total of 190 statements were constructed considering about the health habits, physical health, mental health, childcare, pregnancy management, family planning, immunization care, nutritional requirement, general treatment of diseases and health education.

Judges' rating of attitude statements: All the 190 statements of health status index were mailed to 110 judges in all over India. The judges selected, to rate the items, were subject matter specialists, extension specialists from Agricultural Universities, nutritionist, dietitian, doctors, sociologists, psychologists, and public health specialists. The judges were requested to group into 11 groups on the basis of the degree of favorableness where group 1 stands for Least Favorable to the concept and accordingly group 11 stands for most favorable to the concept. It may be noted that each group may not be having same number of statements. Out of 110 judges, 40 judges returned the statements after duly recording their judgments.

RESULTS AND DISCUSSION

Computing scale score values for each item : The next step was to analyze the rating data. For each statement, the median and interquartile range was computed. The median is the value above and below which 50% of the rating fall. The first quartile (Q1) is the value below which 25% of the cases and above which 75% of the cases fall—in other words, the 25th percentile. The median is the 50th percentile. The third quartile, (Q3) is the 75th percentile. The interquartile range (Q) is the difference between third and first quartile, or Q3-Q1. To facilitate the final selection of items the median and interquartile range were arranged according to the ascending order by mean and, within that, in descending order by interquartile range. The median or scale value and interquartile range of the statements were calculated according to the above-mentioned procedure with the help of Microsoft Excel 2000 and have been shown in Table 1.

Selecting the final scale item : This is the step for selecting the final items, which are at equal intervals across the range of medians. One statement for each of the eleven median values was selected. Within each

Table 1. Scale Value (Median Value) and Inter-Quartile Range (Q) of the 190 statements/items of Health Status Index.

S. No.	Statements	Scale Value	Q Value
1	Regular intake of balanced diet is necessary for maintaining health status.	11.0	1.0
2	The habits of tobacco chewing is highly associated with deterioration in health status.	10.0	1.0
3	Use of tobacco is a cause of many severe diseases and is the pre-requisite of bad health status.	10.75	1.0
4	Use of tobacco affects the health status of a pregnant woman and foetus.	10.75	1.0
5	To maintain the health habits, drinking water should be clean, pure and disinfected	10.75	1.0
6	Chalky white or brownish teeth are symptom of malnutrition, which affects the health status.	7.5	2.5
7	Muscular dystrophy is a malnutritious symptom, which affect the health status.	7.0	2.5
8	Less sleeping habit is predisposed the immune system of the body.	8.0	2.5
9	Colostrums is the first immunization for the baby for maintaining the good health	11.0	1.0
10	Exclusive breast-feeding up to 6 months helps to keep a baby healthy.	11.0	1.0
11	Mixed food items enhanced the health status.	10.0	1.0
12	Too early (teenager) pregnancy affects the health status of the woman.	10.75	1.0
13	Too close pregnancies affect the health status of the children.	10.0	1.0
14	Self-controlled process is more hygienic than using pills or other medical measures to keep the health fit.	10.5	2.0
15	Repeated abortion due to son preference affect the health status of the female.	10.75	1.5
16	Polio vaccination in schedule time (birth to 5 years) is good for maintaining health status.	10.75	1.0
17	Breast milk fulfils the nutritional requirement of the baby up to 6 month to keep the good health status.	10.75	1.0
18	After 1year normal balanced diet is the sufficient for maintaining the health status.	10.75	1.0
19	Anemia is not good for health during pregnancy.	10.75	1.5
20	Administration of iron, folic acid is important during pregnancy for better health status.	10.75	1.5
21	Prophylactic measures like vaccination, deworming, etc may improve health status.	10.75	1.0
22	Safe food, clean drinking water and hygienic environment may result good health status.	11.0	1.0

value, the statements were selected that had the smallest interquartile range. This was the statement with the least amount of validity across judges. The candidate's (judge's) statements were looked over at each level and selected the statement that made the most sense. If it has been noticed that best statistical choice is a confusing statement, then next best choice has selected. 22 items were finally selected within 190 items.

Administering the scale : Now the selected 22 items (Table: 1) were given to 30 participants and were asked to agree or disagree with each statement. To get the person's total score, the average value of the scale scores of all items that person's agreed with, had been calculated.

Reliability and validity test : The reliability of the health status index constructed for the present study was tested by split half method and test-retest method.

Split-half method : The reliability of the index was tested by split-half method. The selected statements of the index were arranged randomly and were then divided into equal halves, with all even number statements in one half and odd number statements in the other half. These two forms of statements were administered to 30 respondents separately. The coefficient of correlation between two sets of scores were computed and found to be 0.93, which was significant at 1 percent level of significance. The reliability coefficient thus obtained indicated that the internal consistency of the health

status index constructed for the study was quite high.

Test-retest method : The same selected statements were administered to the same 30 respondents twice at an interval of 15 days. Thus, two sets of scores were obtained for each of the 30 respondents. The coefficient of correlation between two sets of scores was obtained. The coefficient of correlation calculated for the index developed was found to be 0.93, which was significant at 1 percent level of significance. Hence, this was highly stable and dependable for measurement of health status.

In the present study, the validity of the test was tested as follows:

Content validity : (Lee J. Cronbach and Paul E. Meehl, 1955)- This was established by showing that the test items were a sample of a universe in which the investigator was interested. Content validity was ordinarily to be established deductively, by defining a universe of items and sampling systematically within this universe to establish the test. In content validation, acceptance of the universe of content as defining the variable to be measured is essential.

The contents of the index of the present study derived from relevant literature, expert's opinions and feelings as a measure of checks. This is ensured in the collection and selection of statements for this index. Care was taken to include all the statements, which represent the universe of content of health status index, were being developed.

REFERENCES

1. Amick, Benjamin C. III, Sol Levine, Alvin R. Tarlov, and Diana Chapman Walsh (eds.) (1995). Society and Health. New York and Oxford: Oxford University Press.
2. Boorse, Christopher. (1977). Health as a Theoretical Concept. *Philosophy of Science*. **44**: 542-573.
3. Canguilhem, Georges. (1991). On the Normal and the Pathological. New York: Zone Books. Canguilhem. pp.201.
4. Earl. R. Babbie. (2005). The Basics of Social Research. 3rd edition. Thomson and Wadsworth Publication. pp.178.
5. L.L. Thurstone. (1928). American Journal of Sociology. P. 33, 529-554, reprinted in The Measurement of Values, 1959, pp. 228.
6. Lee J. Cronbach and Paul E. Meehl. (1955). Construct validity in psychological test. First published in *Psychological Bulletin*, **52** : 281-302.
7. WHO. (1976). World Health Organization: Basic Documents. 26th edition. Geneva: WHO.

□ □ □ •