



## TEST RETEST RELIABILITY IN THE DEVELOPMENT OF TOOL TO ASSESS THE QUALITY OF NIDRA

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## ABSTRACT

Ayurveda is a science of body, mind and soul and it has recognized *Nidra* as one of the most important dimensions of health associated with happiness and good health. Happiness and good health are an outcome of a relaxed state of mind. Ayurvedic classics have given special emphasis on three important aspects *Ahara*, *Nidra* and *Brahmacharya* and health of every individual depends on it<sup>1</sup>. These three aspects are called as *Trayopasthamba* or three sub pillars of life. Just as the pillars support a dwelling similarly the *Trayopasthamba* support our body. Sleep and wellbeing go hand in hand and getting a good night sleep is important for overall health. The available literatures in Ayurveda have survived against the adversity of time, and there is a need of more evidence-based research for its global acceptance. A major hurdle faced by young researchers in the research process, is the lack of adequate tools, to assess the unique and basic concepts of Ayurveda, So the need of the hour is development of valid and reliable tools. This article is an attempt to emphasize the significance of the Test retest reliability method, which was administered in the development of tool to assess the quality of *Nidra*.

**Keywords:** *Nidra*, pretest, test retest reliability

## INTRODUCTION

*Nidra* is an integral part of life and Ayurveda gives utmost importance to *Nidra* for the maintenance of health. *Acharya Charaka* describes that happiness misery, nourishment, emaciation, strength, weakness, virility, knowledge, ignorance, life and death all depend on proper or improper *nidra*<sup>2</sup>. It is an essential phenomenon that provides rest and relaxation to the tired body, mind and sense organs. While defining *Nidra Acharya Charaka* describes that when the *Manas* (mind) and *Indriya* (sense organs) get tired and detach itself from their sense objects, the individual falls asleep<sup>3</sup>. Sleep causes major type of physiological effects, it affects the central nervous system and other functional systems of the body. Derangement of *Nidra* can lead to many diseases, therefore the diagnosis and proper assessment of *Nidra* plays an important role. Demand for instruments to screen and assess variety of health conditions in research-based study is growing day by day. Present era demands development and validation of tools for assessing health conditions. There are different methods of finding the reliability of an instrument, in this article, test retest method of reliability, its significance with interpretation of tests retest results are discussed.

### Methodology

#### Steps in tool development

##### 1. Conceptualization

In a research the researcher should have a clear understanding of the words and terms used in research so that there are no conflicts arising later regarding the interpretation and measurements, this makes conceptualization process an essential part in tool development research. This is the first and foremost necessary requirement in tool development of a validated instrument. Conceptualization is breaking and converting research ideas into common meanings to develop an agreement among users, this process ultimately leads to framing new concepts<sup>4</sup>. In this study each attribute regarding *Nidra* was studied in detail and the exact meaning of each attributes were discussed. Discussions were carried out with subject experts. Different aspects of attributes were analyzed, and experts

helped to clarify the concepts and a conceptual definition was obtained for each quality.

##### 2. Operationalization

Operationalization is a substantial aspect of quantitative research and generally referred to as the process of defining as to how to quantify a phenomenon or concept which itself is not directly measurable<sup>5</sup>. It is a transition from theory to measurement. Variables to be used were theoretical. To operationalize the variables were grouped under different domains.

##### 3. Item generation

Based on clinical experience personal experience and discussions in the Kriyashareera Department, each item was generated. Available questionnaires regarding each variable was referred to avoid bias.

##### 4. Item selection

Through a series of pilot steps, item selection was done, overlapping and most frequent questions were deleted. These questions were submitted to content adequacy assessment panel consisting of ten subject experts. Detailed interview and discussions were done. The experts were asked to evaluate the face validity and content validity of each statement and biased overlapping and confusing statements were deleted.

##### 5. Item wording

Familiar words were in uncomplicated sentence structures. The questions were made in a simple way such that a literate person could easily understand. It was ensured that the response categories were exhaustive and mutually exclusive.

##### 6. Item sequencing

It was done to make the order of questions relevant and interesting and thus to increase the variety of response set.

##### 7. Formatting the response

Levels of measurement-Ordinal scale

Scoring pattern- Single construct with single cut off

Scale of measurement – Likert scale

Likert scales are survey questions offering a wide range of answer options from one extreme attitude to another<sup>6</sup>. Typically, they also include a moderate mid-point also. It is popular due to its reliability in measur-

ing options, perceptions and behaviors. In this study a four-point Likert scale was used. Scoring pattern included the scores ranging from 0,1,2, and 3 for each question. The scores of negatively worded items were reversed so that higher scores indicated a better quality of *Nidra*.

**8. Translation and backtranslation**

Translation was done by bilingual translators. Two back-translations were done, and translators were blinded to the original version.

**9. Pretesting**

Pretesting is a method of checking that questions work as intended and are understood by those individuals who are likely to respond to them. A frequent difficulty in questionnaire tool development is that respondents commonly misinterpret questions, this can be avoided by pretesting<sup>7</sup>.

In this study Pretesting was done to obtain feedback from a small but representative sample of potential responders. Pretesting involved informal open-ended interviews with the members. Each individual was asked to answer the questionnaire. While answering the questions they were asked to raise questions if any. The purpose of the activity was to determine the relevance of questions and to assess the extent to which there may be problems to responses. Pretesting provided a rough evaluation of content validity.

**10. Pilot study**

Pilot studies represent a fundamental phase of research process, it is an initial step in exploring a novel intervention or an innovative application of an intervention. Pilot study can inform feasibility and identify modifications required in the design of a larger ensuing hypothesis testing study<sup>8</sup>. Pilot study in this study was conducted by administering the instrument to 30 subjects and the responses were scored using Likert scales and data was entered in excel sheet.

**11. Test retest reliability**

Test – retest is a concept that is routinely evaluated during the validation phase of many measurement tools. Reliability is related to the usefulness of a measurement tool. If the tool is not reliable then it cannot provide useful information for the comparison of different respondents<sup>9</sup>. Test retest reliability coefficient

is a measure of how consistent the results of test are over time. Reliability is the consistency of repeatability of measures. In the present study inter rater reliability was not needed since the scale was a self-administered one. But it was necessary to see how the time gap affects the repeatability of response. That is why reliability was checked with test retest. Intra class correlation coefficient was the statistical test used here. The instrument was given to same individuals at different days. This was done along with the pilot study. The test was done in 10 randomly selected individuals who participated in the pilot study. The first time the test was recorded as T1 and the second time the instrument was given after 30 days and the result was recorded as T2. The scores were fed in excel sheet and the scores of the two occasions were correlated. This correlation is known as the retest-reliability coefficient or coefficient of stability. The correlation coefficient at 95% confidence interval was calculated.

**Test- Retest Reliability of the Instrument**

Instrument items no	Intra-class Correlation	95% Confidence Interval
41	0.926	0.842-0.978

**DISCUSSION**

**Discussion on test retest reliability**

While developing the instrument test retest reliability was done along with pilot study and the measure of reliability was obtained by administering the instrument twice over a period of one month to a group of ten subjects. The score T1 and T2 were correlated in order to evaluate the instruments stability over time. It was necessary to see how the time gap has affected the repeatability of responses. A coefficient correlation of 0 indicates that the respondents scores at T1 were completed unrelated to their scores at T2, therefore the test is not reliable. In present research, in draft scale Likert scale agreement had total of 4 agreement or disagreement responses and number of items were 41. So, it was concluded that a person may not accurately remember the responses given for 41 items. So, test- retest was chosen as a method for reliability assessment in present research. The correlation coefficient

cient at 95% with confidence interval of was 0.926. A high intraclass correlation close to 1 indicates excellent reliability. That means the time elapsed has not changed the responses of the same individual. This proves that the instrument is reliable and can be graded as good.

## CONCLUSION

The test retest reliability method is one among the many steps done in tool development process which assists the researcher to test the stability and reliability of an instrument over a period of time. The test retest reliability of the questionnaire in the tool development process has good reliability, and it suggests that the responses given by the individuals to the questionnaire was stable over a period of time

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