MEASUREMENT PROPERTIES OF GADGET ADDICTION BIOLOGICAL DISCOMFORT SCALE

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ABSTRACT

The nursing department of health care has conducted numerous amount of research and the number of questionnaires developed by nursing researcher has increased in the last few years. While the meticulousness applied to the questionnaire development process may be ameliorated, there is a need for those who develop questionnaires to be published. This paper reports the process of development of Gadget adverse effect biological assessment scale (GABDS) which is a part of a larger study. This tool is developed with an aim to determine the primary school children experiencing biological changes without realizing the ill-effects due to excessive gadget usage. It is a self-administered 14 item Likert scale measures 4 categories such as musculoskeletal problem, sleeping pattern changes, eyesight changes, eating and GI system changes. literature review, blueprint preparation, item development, validity, pre-test and reliability were the stages used in the procedure of its development. After establishing the content validity, the GABAS was pretested. Split half technique was used to assess coefficient correlation using Karl Pearson formula, following which the Spearman's Brown Prophecy formula was used for establishing the reliability $r=0.92$. Item analysis was fixed to evaluate performance of individual question and it showed good results with value for item difficulty ranging from 20 to 80 percentage and item discrimination index of above 0.2. The GABDS is a brief and simple to- use instrument, which is valid and reliable.

Key words: electronic gadgets addiction, biological discomfort.

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BACKGROUND OF THE STUDY:

James M Earnest ,et all (2014)says that gadget poses a threat mainly among children on the view of being exposed to the media and technology in a relatively young age he also states that children need expert guidance towards utilizing technology or will end up with ill effects. Donna H. et, al, (2018) conducted a study among children in special school east java Indonesia. Nine children met the criteria of early exposure. One group of the parent was told to interact during the exposure to gadgets and another group was told not to interact during the exposure for duration of 6 months 66.6% of children were found to have behaviour problem when tried to interact and also hyperactivity in children who watched phones for more than 3 hours a day. Al Khelaiw.T, Meo SA(2004) conducted a study with 437 subjects who used mobile phones using a self structured questionnaire about health hazards of mobile phones the study found association between ill health and mobile phones. The results states that the Mean % of head ache was 21.6%, fatigue3%, dizziness 2.4%, sleep disturbance 4%, the study computed that usage of mobile phone is a hazardous risk factor for ill health among any teenage group. Sulthan A Meo, Abdul. M. A. Dress(2005)conducted a study to find out the connection between mobile phone and hearing and vision problems the sample size was 873 in the study the tool used for this study was a structured questionnaire about self medical history of the participants, the results showed that 54.5%of the subjects had impaired hearing, ear pain and about 5.04% had eye sight blurdness. Amitha M H (2019) conducted a descriptive analysis; study was carried out to find out the effect of the usage of electronic gadgets in the overall behaviour, academic performance and health of the school going children. The sample size consisted of 240 students of age group 12 to 16 years. A questionnaire survey was conducted the questionnaire assessed the over use of electronic gadgets and their effects on kids behaviour, academic performance and overall health. The result showed that 69% of the students like to use gadgets at night before sleeping of which 59% of the children complained of frequent headaches in the morning along with some difficulty in seeing the blackboard from back benches. 53% of the children had difficulty in concentrating during classes or at home while studying, hence reporting an overall fall in their grades the researcher concluded that the use of gadgets contributed mainly in deteriorating health in one way or the other. The GABAS was developed for primary school children consisted of 4 areas such as musculoskeletal problem, sleeping pattern changes, eyesight changes, eating and GI system changes.

METHOD: According to (Ram. B. Radhakrishnan, 2007) Development of a valid and reliable questionnaire involves several steps taking considerable time. The sequential steps involved in the development of knowledge questionnaire used in the present study are represented in Figure 1.

FIGURE NO 1 steps used in the development of the GABAS

REVIEW OF LITERATURE

Burns & Grove (2002) stated that review of literature is an analysis of studies conducted to generate what is known and not known about a particular problem and to analyse whether knowledge is ready for use in practice. A literature search was performed using PubMed, CINAHL, books, reports, articles, periodicals, published and unpublished research studies and mass education media. The purpose of the review was twofold: (i) to Find an existing instrument to assess adverse effect in biological parameters due to gadget addiction (ii) to provide a comprehensive background for understanding current knowledge and highlighting the importance of new research for the development of tool family assessment device FAD (epision. et, al) issued On reviewing the literature, the authors found that the existing instruments were not appropriate for assessing the sleeping pattern Musculo skeletal problems eating disorders in biological assessment . Therefore, this instrument GABDS was developed. The review viewed was helpful for the authors to plan the content of the tool. Following the review, the blueprint was prepared.

PREPARATION OF THE BLUEPRINT

Blueprint is a guide that helps in the development of a questionnaire (Anderson and Morgan, 2006). After the literature search, the authors prepared a blueprint to facilitate a guide for item construction. The blueprint acts as the guideline so that sufficient items are developed at the appropriate level to test important content areas and objectives Oermann and Gaberson, (2009). The GABDS developed for primary school children consisted of four areas that is Musculo skeletal system changes, eye sight changes, sleep disturbances and eating changes.

DEVELOPMENT OF THE ITEMS

The items were developed on the basis of the blueprint. The authors considered all factors that contribute to the quality of the test items and chose to use the 3 point Likert scale not at all, sometime, all the time. While preparing the draft of the Likert scale the wording of each question for clarity, sensitivity to respondent's psychological state, absence of bias and reading level were considered. The draft was finally reviewed by the authors, and it was validated by experts.

DEVELOPMENT OF THE PROBLEM

The investigator produced a pool of items based on the literature that was reviewed, the clinical observation, and their professional experiences. While preparing the draft of the Likert scale the wording of each question for clarity, sensitivity to respondent's psychological state, absence of bias and reading level were considered. The draft was reviewed by the authors and was validated by experts.

CONTENT VALIDITY

To determine the field of content validity the GABDS along with its blue print and checklist was submitted to three experts from the nursing field and medical field. The GABDS was validated two times in terms of % of the agreement. The first validation of the 14 items in the GABDS, 14 items has 100% agreement among experts.

PRETESTING

Pre testing the tool is an essential stage before establishing reliability. The main aim of conducting a pre-test is to pretesting make sure acceptance of the study by the participants and also to check question wording, it is the trial administration of a newly developed instrument to identify flaws or assess the time requirement (Polit & Beck, 2011). After obtaining formal administrative permission, the English version of the tool was administered to 20 primary school children in selected schools in Pathankot. This was carried out to determine the clarity of the items and the average time required for completing the tool. The GABDS was found to be clear and understandable to the subjects. The average time taken to complete the tool was approximately 25-30 minutes. The reliability of the GABDS was established after the pretesting.

RELIABILITY

Reliability refers to the degree of consistency or dependability with which an instrument measures the attribute. Pilot and Becker (2011) the stability of quantitative measure is the extent to which the same scores are obtained when the instrument is used by the same people on a separate occasion. Assessment of stability is derived through test retest procedures; it is a statistical means used to estimate element of measurement error by repeating the measurement process on the same subjects, under conditions as similar as possible, and comparing the annotations. Oermann MH, Gaberson KB (2009) The item-total correlation test is performed to check if any item in the set of tests is inconsistent with the averaged behaviour of the others, and thus can be discarded. The analysis is performed to purify the measure by eliminating garbage items previous to determining the factors that represent the construct. Lawshe CH (1975) The reliability of the GABAS was established using test retest and internal consistency.

Item analysis applied; there were 14 items with coefficients 0.30, which indicates that there was a low correlation with other items in the instrument. The final instrument consisted of 14 items [Table 1]. The Cronbach's alpha computed was 0. 7089. It is evaluated that the Cronbach's alpha if the item deleted (Last

column) was above 0.70 for all the items. In fact, in which of the values is greater than the alpha of the whole scale that is 0.8. This means that no need to drop any items. Gliem AJ, Gliem RR (2013).

TABLE 1

Items	Mean	S.D	Corrected Item Correlation	Alpha
Item 1	1.8000	.5231	.0690	.7148
Item 2	1.8000	.6156	.2778	.7783
Item 3	1.7500	.5501	.1752	.7858
Item 4	1.8500	.4894	.4403	.7471
Item 5	1.8000	.5231	.0960	.7089
Item 6	1.6500	.5871	.4822	.7411
Item 7	1.8000	.5231	.3531	.7629
Item 8	1.8000	.5231	.5231	.7332
Item 9	1.8000	.5231	.6067	.7168
Item 10	1.8500	.4894	.1720	.7968
Item 11	1.7500	.5501	.0482	.7363
Item 12	1.7000	.5712	.1192	.7504
Item 13	1.9000	.4472	.0668	.7301
Item 14	1.7000	.5712	.4846	.7363

TEST-RETEST RELIABILITY

Test-retest reliability using Pearson's correlation coefficient was completed using the formula.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

The r value of the GABAS was 0.78 and it shows that the GABAS was reliable.

DISCUSSION

A tool to determine the electronic gadget adverse effect biological assessment scale for an Indian setting has not been formulated yet. The higher the alpha is, the more reliable the test is considered. Usually 0.7 and above is acceptable. (Nunnally JC., 1978) The Cronbach's alpha value of the GABDS was found to be acceptable (0.7089). The Cronbach's alpha coefficient is a measurement of the internal consistency of the items in the instrument. If the overall Cronbach's alpha coefficient is over 0.70 it is sufficient. Alpha coefficient indicated that internal consistency was adequate. The test-re test reliability showed the tool was stable.

LIMITATION OF THE STUDY

The limitation of this study is that factor analysis was not computed.

CONCLUSION

This study concludes through the study findings that GABDS had a reliability and validity within the acceptable range. The factor analysis will be done on more samples after which the instrument will be used in further studies

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