ORIGINAL RESEARCH

# Validation of Psychometric Scale on Selfie Addiction

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## ABSTRACT

**Introduction:** There are many psychometric scales for measuring the different types of behavioral addiction but none for Selfie addiction. The investigator and his team developed a ten item scale to measure and screen the selfie addiction. Objective of the study wasto assess the validity of the Selfie Addiction scale using content validity ratio and content validity index.

**Materials and methods:** The investigator developed the scale in stages by focus group discussions with the 5 groups of 8 per team followed by collecting the essentiality and relevance of the developed scale questions with the 32 expert panellists. The essentiality and relevance were measured by three and four point scale from the expert panelists. Validation was done by content validity ratio and content validity index: both item and scale content validity index and compared with critical values.

**Results:** The overall proportion of agreeing essential ranges between 68.8% to 87.5%; and the CVR critical exact values range between 0.375 - 0.75, the Item content validity was appropriate for all the items in the scale which is more 0.8, and the overall scale content validity index was 0.4 with 0.9407 averages Scale CVI.The mean relevance score was 3.56 to 4.0 for different items in the scale.

**Conclusion:** This study revealed that the proposed scale has got appropriate content validity ratio and content validity index which means that the questionnaire is valid screening tool.

**Keywords:** Psychometric scale, selfie addiction, content validity ratio, content validity index

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## INTRODUCTION

Questionnaires designed for the purpose of conducting any research should undergo a validation processing before it could be administered for a large population to assess whether the newly developed scale or the questionnaire can measure what is supposed to measure which is often defined as "VALIDITY". There are several types of validity namely content validity, construct validity, criterion validity, predictive validity, concurrent validity and face validity.[1,2,3] While there are several types of validity, the most important type is probably that of content validity, in which connections between the test items and outcomes are established. If a thorough questionnaire development process was followed, analysis of each items are conducted, an appropriate set of item specifications were developed and writing guidelines were carefully followed, then the content validity of the test is likely tobe very high. Content validity is typically estimated by gathering a group of experts together to review the test items and then they are asked to indicate whetherthey agree or not that each item is appropriately matched to the content area indicated.This content validity can be measured by "CONTENT VALIDITY RATIO" and "CONTENT VALIDITY INDEX" for individual items and over all scale. This quantification of content validities were explained by CH.Lawshe in 1975.[4] Content validity can be analysed by using either four point or five point scales which were described by Mussio et al (1973) et al and Drauden et al (1974).[5,6] This study attempts to use the quantification of content validity in assessing the validation of the 10 item scale developed for estimating the prevalence of selfie addiction. Aim and objective of the study was to assess the usefulness of the newly developed selfie addiction item scale (psychometric scale), a ten item scale by quantification of content validity and its indices.

## MATERIALS AND METHODS

**Step -1 – Focus Group Discussion on the Selfie**

**Addiction Topic with the Groups was Conducted**

*Focus Group Discussion*
A panel of members united together to have an interactive session on a specific topic is called as "FOCUS GROUP DISCUSSION". This session enhances the topic of conversation with different perceptions, opinions, concepts, ideas and areas to be improvised. Robert K. Merton, the associate director sociologist of Bureau of Applied Social Research in the USA was the first person to create "Focus Groups." Selection of our Focus group involved a process of lots of planning to obtain a "High quality focus group". The focus groups were scheduled; the time, location and aids needed for the session were organised. We ensured to provide an ambient atmosphere for their uninterrupted interaction. We also reduced the expected barriers that a volunteer would face while attending our session by arranging a weekend so that their daily activities are not disturbed and transportation services.
Our planning was formulated in the following order.
1. Defining Focus Group
2. Criterion For Designing Questions (Word selection, Grammar, Simplicity, Clarity etc were explained)
3. Designing of questions by the Focus group
4. Exploration of Appropriate questions

*Defining Focus Group*
The Inclusion and Exclusion criteria were constructed based on the purpose of our research study.The participants of our focus group should satisfy the following criteria:
• Individuals familiar with the topic of discussion
• Individuals with incorrigible craving for taking selfie's
• Participants willing to volunteer 2 hours of their time
These criteria were used as basis of screening process among the participants. Each focus group composed of 8 members and 5 groups were selected. Seating arrangements were made in such a way that all the participants were facing each other. We were very concerned about the number of participants in each group because it should neither be too small for discussion nor too large where some participants are left out in the discussion. Ice breaking sessions were arranged to socialize themselves along with their respective groups which will enhance their level of participation. The members were led through by a skilled moderator, Dr.BalajiArumugam for an open discussion. The moderator gener-ated maximum number concepts and ideas from all the participants.

*Criterion for designing questions*
Focus group participants were instructed about designing the questions.
• It should be focussing on the topic of discussion with clear framing of words
• Contradictory ideas to be avoided
• Open ended or closed ended questions
• Non - Embarrassing questions

*Designing of questions by the focus group*
We ensured that homogenous group of members from various professions participated effectively on the topic "SELFIE ADDICTION". The participants were requested to take questions related to selfie's by exchanging their thoughts and opinion among their groups within an allotted time of 30 minutes.

*Exploration of appropriate questions*
After the allotted time period, the questions from 5 groups were collected and discussed by moderator. Volunteers from each group were asked to read their questions and each question was taken for discussion. The goal of discussion of questions is to frame appropriate questions, minimize errors, ensure adequate number of questions and limit bias.

*End of the Sessions*
At the end of the focus group discussion, the entire team came to a consensus on ten item questionnaire scale which could be used to measure the selfie addiction.

**Step – 2 – Individual Direct Interview among Different Expert Panelists was Conducted for Content Validiy and Face Validity**

*About the scale*
"Selfie – Addiction" – validation of the scale depends upon "indices of relevance" of the content to this topic. Our scale measures the symptoms of addiction that fulfils the expectations of the acceptability of the condition. Our Scale was developed with the underlying support, argument and with inculcating divergent ideas from the "EXPERT PANEL", who has agreed to the domain and facet of our construct.

*About the process*
In our study, we presumed in attempting to find the addicts among Selfie takers with a self-reported questionnaire.

Scale for validation was subjected to expert review which included all the dimensions of selfie-addiction which was finalised by the previous group discussion. The relevance of the developed scale questions were assessed by 32 panel doctors, majority were psychiatrists. The investigator of the study visited doctors from various specialities and explained the objective of the study. The Scale was administered and collected immediately to ensure strict confidentiality. Every element of our scale was assessed by 3 point and 4 point evaluation scale in the view of essentiality, relevance, representativeness and specificity. Assessment of an individual's psychological feeling and the emotive outcomes cannot be achieved without great efforts. Systematic evaluation of the person that includes behavioural and psychological assessment is required to interpret their mental wellbeing. It is achieved through direct observation, self-assessment tools, questionnaire or standardised scales. In conditions like depression, post-traumatic stress disorders or already diagnosed behavioural problems there exists tools for assessment. But, "SELFIE – ADDICTION" newly advanced among the denizens due to the technological exploration lacks paradigms for clinical decision-making. Hence, in the process of developing an assessment of addiction scale that includes the aspects like situational facets, external stimuli and behavioral observations. During the process of validation of the ten item scale for selfie addiction, all the expert panelist were very cooperative and answered very politely with the responses. So the entire process of data collection on validation of the scale was very smooth and motivating for the investigator.

## RESULTS

A total of 32 expert panelists were utilized for assessing the content validity of this newly developed item scale for selfie addiction. The overall agreement percentage for each item in the scale is given in the table 1. The agreement rate ranges between 68.8% to a maximum of 93.8%. Almost all the items in the scale had agreement rate of above 75% except one item.

### Content Validity Ratio
CVR was calculated from the responses of three point rating scale for each item, 3 for essential, 2 useful but not essential, 1 not essential. Table – 2 depicts the proportion agreeing essential with minimum acceptable value, CVR critical exact values with minimum acceptable value and P value, N critical – minimum number of experts required to agree item essential.
The formula used for content validity ratio was = $Ne – N/2$ divided by $N/2$, where $Ne$ is the number of panelists indicating "essential" and N is the total number of panelists.[7]
In our study it has been shown clearly that the exact content validity ratio is more than the acceptable limit (0.375) which means the ten item scale has good content validity. Similarly the proportion agreeing minimum is 0.688, but our study has all the items more than this value except one item in the scale which is same as 0.688. The N critical that is the minimum number of experts required to agree item essential according Colin Ayre et al is 22 and Wilson et al is 21. Our study has got N critical of 22 for one item and for all the other items it is more than the table value of 22.

## CONTENT VALIDITY INDEX

Similarly Content validity index was calculated using four point scale rating 1 to 4 where 1 being not relevant and 2 – item need some revision, 3 – relevant but need some revision, 4 – very relevant. CVI for relevancy was

| Questions | Agreement (frequency) n = 32 | Agreement (percentage) |
|---|---|---|
| I always sneak time to take selfie's | 28 | 87.5 |
| I always ponder of taking selfie irrespective of my work loads | 26 | 81.3 |
| I forget the time, environment and even my relations when i am taking selfie's | 28 | 87.5 |
| I find myself uncontrollable to stop taking selfies once i start it | 30 | 93.8 |
| I use more than one electronic device to take selfie simultaneously | 22 | 68.8 |
| I take selfie's even during sad situations | 25 | 78.1 |
| I feel exasperated when i am unable to take a selfie | 24 | 75 |
| I endeavour to cut down the amount of selfie's i take, but i fail | 28 | 87.5 |
| I need counselling to reduce my selfie addiction | 26 | 81.3 |
| I cannot survive without taking selfie's | 26 | 81.3 |
| **Table–1:** Agreement rate for all the items from expert panelist on validation of selfie addiction scale | | |

| Items | Panel size | Proportion agreeing essential | Proportion of agreeing minimum (table – value) | Cvr critical exact values | Cvr critical (table and p value) | N critical (minimum number of experts required to agree item essential) – table colin ayre et al | N critical calculated from cribinom function (Wilson et al) – 2012 |
|---|---|---|---|---|---|---|---|
| I always sneak time to take selfie's | 32 | 0.875 | 0.688 | 0.75 | 0.375 (0.025) | 22 | 21 |
| I always ponder of taking selfie irrespective of my work loads | 32 | 0.813 | 0.688 | 0.625 | 0.375 (0.025) | 22 | 21 |
| I forget the time, environment and even my relations when i am taking selfie's | 32 | 0.875 | 0.688 | 0.75 | 0.375 (0.025) | 22 | 21 |
| I find myself uncontrollable to stop taking selfies once i start it | 32 | 0.938 | 0.688 | 0.875 | 0.375 (0.025) | 22 | 21 |
| I use more than one electronic device to take selfie simultaneously | 32 | 0.688 | 0.688 | 0.375 | 0.375 (0.025) | 22 | 21 |
| I take selfie's even during sad situations | 32 | 0.781 | 0.688 | 0.563 | 0.375 (0.025) | 22 | 21 |
| I feel exasperated when i am unable to take a selfie | 32 | 0.750 | 0.688 | 0.5 | 0.375 (0.025) | 22 | 21 |
| I endeavour to cut down the amount of selfie's i take, but i fail | 32 | 0.875 | 0.688 | 0.75 | 0.375 (0.025) | 22 | 21 |
| I need counselling to reduce my selfie addiction | 32 | 0.813 | 0.688 | 0.625 | 0.375 (0.025) | 22 | 21 |
| I cannot survive without taking selfie's | 32 | 0.813 | 0.688 | 0.625 | 0.375 (0.025) | 22 | 21 |

**Table–2:** Showing the proportion of agreements and content validity ratios for each item in the questionnaire in comparison with cvr critical, one sided p values and n critical

calculated by number of those judging the item relevant (3 or 4) divided by total number of experts. I – CVI was calculated by number of experts giving a rating 3 or 4 divided by the total number of experts. The I – CVI express the proportion of agreement on relevancy which ranges between 0 and 1 whereas the S – CVI is the proportion of items on an instrument that achieved a rating of 3 or 4 by content experts.[10,11,12]

## DISCUSSION

Our study had explored the greater utility of the various methods of quantification of content validity by measuring content validity ratio, Item content validity index and scale content validity index using very simple formulae from various resources. In this study the validation of selfie addiction – a ten item scale: developed by the investigator with the focus groups discussion followed by expert panelists opinions has proved to be valid because the calculated values of CVR and CVI are well above the acceptability limits suggested by various social scientists. The generation of items for questionnaire is very challenging for which requires lot of pilot work to refine wording, clarity, meaning, non repetitive, response format, questionnaire layout and use of subscales.[16] Similarly the investigator, focused on all these issues while creating and developing the 10 item scale for measuring selfie addiction. The investigator adopted two major methods: intensive focus group discussion of the medical graduates followed by expert panelist opinion regarding essentiality, relevance and clarity of the items specified in the scale. Demonstrating different types of validity on the newly developed questionnaire items becomes mandatory for all the investigators to ensure the questionnaire

| Items | Rating 3 or 4 | Rating 1 or 2 | Item content validity index | Interpre-rtation |
|---|---|---|---|---|
| I always sneak time to take selfie's | 32 | 0 | 1.000 | Appropriate |
| I always ponder of taking selfie irrespective of my work loads | 30 | 2 | 0.938 | Appropriate |
| I forget the time, environment and even my relations when i am taking selfie's | 30 | 2 | 0.938 | Appropriate |
| I find myself uncontrollable to stop taking selfies once i start it | 32 | 0 | 1.000 | Appropriate |
| I use more than one electronic device to take selfie simultaneously | 28 | 4 | 0.875 | Appropriate |
| I take selfie's even during sad situations | 29 | 3 | 0.906 | Appropriate |
| I feel exasperated when i am unable to take a selfie | 28 | 4 | 0.875 | Appropriate |
| I endeavour to cut down the amount of selfie's i take, but i fail | 28 | 4 | 0.875 | Appropriate |
| I need counselling to reduce my selfie addiction | 32 | 0 | 1.000 | Appropriate |
| I cannot survive without taking selfie's | 32 | 0 | 1.000 | Appropriate |

**Table-3:** Showing the content validity index for all the items according to the relevance rating

**Note: Item content validity index of more than 0.8 – the items will be considered appropriate.[5]**

ICVI > 0.8 – appropriate

ICVI between 0.7 to 0.79 – needs revision

ICVI less than 0.7 – item is eliminated

Our study has shown the ICVI of more than 0.8 for all the items.

**Calculation of Scale – Content validity index[13]**

Number of items considered relevant by all the experts: 4

Total Number of items: 10

Scale content validity index/ Universal agreement (SCVI/UA) = 4 / 10 = 0.4

SCVI / Ave – Scale Content Validity Index / Average = Average of all ICVI divided by 10 (number of items)

= 1 + 0.938 + 0.938 + 1 + 0.875 + 0.906 + 0.875 + 0.875 + 1 + 1 = 9.407 divided by 10 = 0.9407

Acceptability of SCVI/ Ave is 0.9 and above.[14,15]

can then be used further for research purposes. There are various methods of demonstrating and quantification of validities like measurement of content validity ratio and content validity index, factor analysis and for reliability; internal consistency, test retest reliability, inter rater reliability, measurement of Cronbach's alpha and correlation matrix.[17] In this study the investigator has utilized mainly the content validity ratio and indices to demonstrate the content validity in the ten item scale.Many other studies demonstrated the utility of content validity quantification as the initial and most important step of validation of psychometric scales.[18,19] Similarly Holli A Devon et al[20] study on psychometric toolbox for testing validity and reliability revealed that the frequently reported were content validity but the expert panelist were only 5 or less than five. But our study boldly attempted to include more number of panelists to assess the content validity ratio and indices and showed that both content validity ratio and content validity index are well above the acceptable limits.

## CONCLUSION

The validity of a test is critical because, without sufficient validity, test scores have no meaning. The evidence collected and documented about the validity of an item scale should be the best defense to support our study questionnaire scale. While there are several ways to estimate validity, the most important and initial type of validity to establish is the content validity.

**Contributorship Statement**
Author 1: The Principal investigator designed the study, conducted the focus group discussion, and created the

questionnaire, data analysis and writing the report on the article.

Author 2: The co author assisted in designing the study, conduction of focus group discussion, data collection and entry into MS excel sheet, creating master tables, critically reviewing the article.

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| Items that measure selfie addiction | Sa 5 | A 4 | Neutral 3 | Da 2 | Sda 1 |
|---|---|---|---|---|---|
| I always sneak time to take selfie's | | | | | |
| I always ponder of taking selfie irrespective of my work loads | | | | | |
| I forget the time, environment and even my relations when i am taking selfie's | | | | | |
| I find myself uncontrollable to stop taking selfies once i start it | | | | | |
| I use more than one electronic device to take selfie simultaneously | | | | | |
| I take selfie's even during sad situations | | | | | |
| I feel exasperated when i am unable to take a selfie | | | | | |
| I endeavour to cut down the amount of selfie's i take, but i fail | | | | | |
| I need counselling to reduce my selfie addiction | | | | | |
| I cannot survive without taking selfie's | | | | | |
| **Annexure:** Dr. Balaji Arumugam's and Dr. Saranya Nagalingam's Psychometric scale for selfie addiction | | | | | |