Smartphone usage by old adults: the simple evidence based on behavioural issue

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Smartphone usage by old adults: the simple evidence based on behavioural issue

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Abstract. Smart phones and people are two things something not separate that from one another. Children, adolescents and adults use smart phones. Their intensity with their smart phones varies. Smart phones provide a variety of features, not just to receive and make long-distance calls, activities such as self and edit it for hours, watching movies, surfing the Internet, games, social media and others can also be done. Various data show that the cumulative time of this activity results in a high level of smart phone usage, both in children, adolescence and adulthood. So, what about old adult? This study aims to measure the level of old adult interaction with smart phones against 59 respondents. Measurements using a monophobia questionnaire (NMP-Q). It analysed data using Rasch Model and Network Psychometry. The results show that the old adult interaction rate of the smart phone is at high, medium, and low levels.

1. Introduction

Smartphones are high-level mobile phones. There is no manufacturer standard that determines the definition of a smartphone. Smartphones have penetrated into people's lives at a faster pace in the recent times. They are being used for several purposes besides talking and messaging such as live chatting, searching for information, mobile banking and entertainment, etc. [1].

The important attraction of smartphones is their personalized environment, which is mainly provided by varied applications [2]. The smartphone has many attractive attributes and characteristics that could make it highly addictive[3], [4]. This makes people cannot get out of their smart phones [5]. Almost no day without a smart phone [6], This happens in various age ranges, ranging from children, adolescents, adults to old adult. Addiction of smart phones occurred in 256 of 1,519 youth students (15 to 16 years) [4], [7], [8]. On average the time spent on mobile devices has increased in 2015 of about 117 % from the previous year [9]. This means that the amount of time individuals interact with the smartphone and mobile devices at large is growing every year, thus opening the possibility to leverage human-smartphone interaction for research and further development [10].

Addiction to smart phones can lead to conflict with others [11], anxiety and depression [12], stress [10]. Stress also results in hypertension and coronary artery disease [13], cardiovascular disease [14], diabetes and obesity [15], low life span [10]. The smart phone is considered having a positive impact by

young people, related to social networking and business convenience [4], [16]. Regardless of the impact of smart phone addiction, another interesting part that needs to be focused on is the plumbing term, which is an indifferent term for someone in an environment because it focuses more on gadgets than building a conversation [17]. This shows that people interact more with their smart phones than the surrounding people to maintain a sense of individuality [18]

This phenomenon also occurs in old adult. However, to get accurate data related to this, it needs more in-depth research. So, it focuses this research to measure the level of interaction of old adult to smart phone. It refers old adult to in this study are those with an age range 45-70 years [19]. To obtain accurate and appropriate data for research, we used monophobia questionnaire (NMP-Q) [20], [21]. Although this instrument is not the only instrument it commonly uses that. In previous research, they have used various instruments to measure smart phone addiction, including Smartphone Addiction Scale [12], [22], Mobile Phone Problem Use Scale (MPPUS) [23], [24], etc.

2. Method

The participant involved in this study as 59 old adults in Indonesia. Sample used simple random sampling. The instrument contains 20 items used 5-point Likert rating scale. It measures the level of interaction of old adult to the used smart phone monophobia questionnaire (NMP-Q) developed by Yildirim, C., & Correia, A.P., 2015 [20]. The results of data collection were analyzed used Rasch Model, which is focused on estimating quality test item, test information function, and quality person. The software WINSTEPS 3.73 was used to generated and examine data collection. And used Network Psychometrics to description of nodes. The research data set can be accessed in osf.io. Open Science Framework.

3. Result and Discussion

The purposes of this research are: (1) to assess the property and quality of monophobia questionnaire (NMP-Q), (2) to measure Internet addiction in old adult.

3.1 Quality Test Items

The nomophobia questionnaire (NMP-Q) evaluation uses Rasch, through several stages. The first stage is to review the reliability of nomophobia questionnaire (NMP-Q). It can see the estimation results in table 1, where the reliability item is .92, which mean that the instrument consistency is at the fantastic level. Then to know the observed value, it can be based on label 1 and 4. Observed average (Label 1) is -2.33 to +0.64 (Label 2). The second stage, on the unidimensional estimation through the main component (PCA) identified the value of crude variance described with a size of 59.5%. This shows that they have reached the unidimensional conditions of the instrument (> 15%) [24]. The third stage, the categorization of item fit and misfit on the instrument can be assessed by comparing the OUTFIT MNSQ value to each item with the average OUTFIT MNSQ value of +1.00 logit. This shows that it squares the outfit value of the mean square 1.01 of the ideal range (0.5>MNSQ<1.5). The fourth stage is to identify the extent to which nomophobia questionnaire can measure information (NMP-Q) (shown in Figure 1 and 2).

Table 1. Summary of quality test items

Estimation	Values
Item Reliabilities	.92
Separation Index of Item	3.47
Mean OUTFIT MNSQ	1.01
Raw variance explained by measures	59.5%
Raw variance unexplained by measures	40.5%
Observed average (Label 1)	-2.33
Observed average (Label 4)	.64

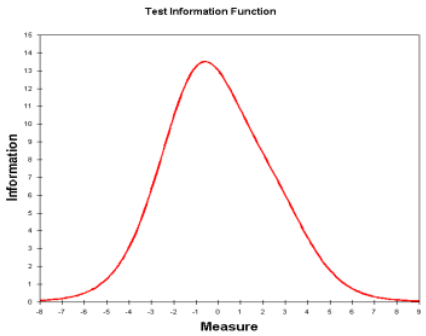

Figure 1. Test Information Function (TIF)

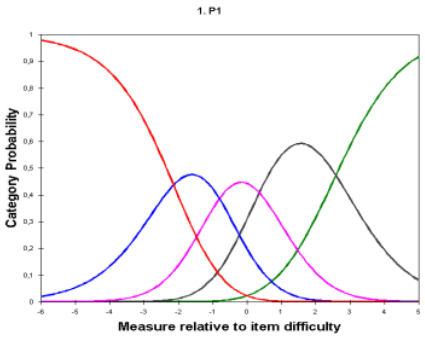

Figure 2. Category Probability

Figure 1 shows that the output of information collected by nomophobia questionnaire (NMP-Q) is at the maximum level for respondents with high, medium and low ability. So, the nomophobia questionnaire (NMP-Q) is less efficient to use for respondents are at high and low levels. This condition is confirmed by Figure 2, where the probability of correct and false choice of answers is high, medium and low.

3.2 Quality Person

Based on table 2 it knows it the ability of respondents to do nomophobia questionnaire (NMP-Q) above average (+.07 logit> 0.00 logit). The reliability of respondents in answering instruments is also good, the interaction between individuals with superb items (α = 0.87).

Table 2. Summary of quality person

Estimation	Values
Person Reliabilities	.94
Separation Index of Person	3.92
Mean Person	.19
Mean OUTFIT MNSQ	1.00
Cronbach Alpha (KR-20) Person raw score reliability	.87

Furthermore, the network conditions of the factor structure of the Internet addiction are graphed as figure 3 and 4.

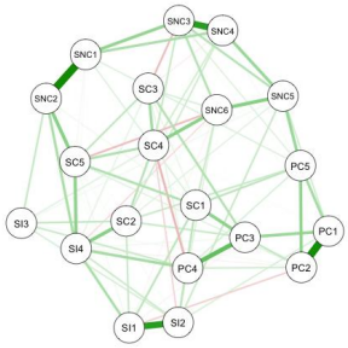

Figure 3. A Network Model interaction between the factor structure of Internet addiction.

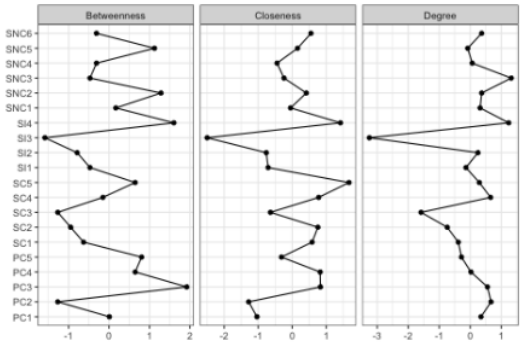

Figure 4. Closeness, betweenness, and degree centrality of the three networks describe of the factor structure of Internet addiction.

All measures show how important nodes are in a network, with higher values indicating that nodes are more important.

Table 3. Description of nodes shown in Figure 3 and Figure 4

Nodes	Description
SI1, SI2, SI3, SI4	Not being able to communicate
SC1, SC2, SC3, SC4, SC5	Losing connectedness
SNC1, SNC2, SNC3, SNC4, SNC5, SNC6	Not being able to access information
PC1, PC2, PC3, PC4, PC5	Giving up convenience.

Figure 3 and 4 illustrate the corresponding and unrelated items in Figure 3 that mean have the positive partial correlation, and any red edges show that the mean negative partial correlation [25], [26]. The items that have a strong positive correlation are SNC1 items with SNC2, SNC3 with SNC4, SI1 with SI2, PC1 with PC2. While items with negative partial correlation are SI1 items with PC2, SI2 with SC4, SC4 with PC4, SC4 with SI2, SI4 with SNC6, SC5 with SC6, SC3 with SNC3, SC3 with SC4. To find out the nodes in figure 4 further, it can see it in table 3.

4. Conclusion

Based on the results from the study, we affirm that (1) Internet addiction experienced by an old adult is at high, medium, and low levels. The tendency of respondents to answer is to be very agree and agree, (2) the nomophobia questionnaire (NMP-Q) property is adequate, where the respondent's reliability in answering the instrument is good, and the interaction between the individual and the item is superb.

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