

Confirming The One-Item Question Likert Scale To Measure Anxiety

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Citation

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Abstract

Background: A previous study has confirmed the feasibility of one-item question scales to adequately measure current anxiety in a female-only sample in clinical settings. This study aims to further determine whether a one-question likert scale can be used in measuring anxiety in the general population for both genders.

Method: A convenience sample of adults, recruited via a smartphone application (app) published freely in Apple's app store that have completed the Social Phobia Inventory (SPIN) questionnaire and a one-item anxiety question scale.

Result: 1,233 participants from the US, UK, Australia, and Canada completed the questionnaire. 67% of participants were female, with a high school education level, and a relatively young age, while the participants' mean age was 28.7. Chi-square analysis has shown no significant differences between countries, in terms of gender $\chi^2 (3, N = 1233) = 4.5$ $p = .21$, education level $\chi^2 (9, N = 1233) = 14.5$ $p = .10$, and age $F(3,1232) = 1.52$, $p = .21$. There was a strong, positive, partial correlation between SPIN score and the one-question anxiety scale, controlling for age, gender, country, and education, $r = .72$, $p < .001$, with a high SPIN score being associated with a higher score on the one-question anxiety scale. An inspection of the zero order correlation ($r = .73$) suggested that age, gender, country, and education had very little effect on the strength of the relationship between SPIN score and the one-question anxiety scale.

Conclusion: This study confirmed that the one-question anxiety scale is suitable to be used to measure anxiety in both genders.

BACKGROUND

A previous study has examined the feasibility of using a one-item question scale to adequately measure current anxiety [1]. The study compared the one-item anxiety scale against the Spielberger State Trait Anxiety Inventory (STAI) [2] and found a good positive correlation between the STAI and the one-item measures [1]. Although the study found the one-item anxiety scale adequate to measure levels of current anxiety, their sample only included women in a clinical setting.

The Social Phobia Inventory (SPIN) [3] is a 17-item scale commonly used as a self-rating questionnaire for social anxiety, and features good psychometric properties [3,4]. In addition, SPIN has been used successfully to screen the general population for social anxiety disorder (SAD) in various ages, gender groups, and delivery platforms (e.g., Internet screening) [5-7].

This study is part of a health monitoring app project to evaluate the feasibility of using smartphone apps for health

tracking and monitoring with various repeat measures, in which measuring the participant anxiety at each giving task is a secondary measure. Similar to Davey et al.[1], we were interested to know if we can reduce participants' efforts in filling the repeated measure by using only a single-item measure of anxiety. The purpose of this study was to determine whether a one-question likert scale can be used in measuring anxiety in the general population, for both genders, via a smartphone app in place of the SPIN.

METHOD

Design: A free smartphone app has been developed, utilising the health monitor template[8], and was released globally in the Apple app store [Figure 1]. After agreeing to the participant information and consent that were provided in the terms of use statement, and summarised in the app download page, Apple store users aged 18 and above can download the app. After filling out the demographic information, participants can use the SPIN to screen or monitor their anxiety, as the app will save the participant's results on their

devices. After completing the SPIN questionnaire, the app will ask participants to answer the one-question likert scale for current anxiety, as described in the Davey et al. study: “Please circle the number that shows how anxious you feel at the moment”. If you circle ‘1’, you are feeling not at all anxious at the moment. If you circle ‘5’, you are feeling the most anxious you could ever imagine. If you circle ‘3’, you are feeling moderately anxious” [1]. The answers thus consisted of five evenly spaced numbers, each anchored to a separate level of anxiety “(1=not at all anxious, 2=a little anxious, 3=moderately anxious, 4=very anxious, 5=extremely anxious)” [1]. The demographic information, SPIN, and the one-item question answers will be sent directly from the user device to our research database as soon as the internet connection is available. Each participant was issued a unique device identifier to link their result to our database; this will help in eliminating the registration process and preventing duplication, as each device has only one chance of being in our database and, finally, to ensure anonymity. No personally identifying, contact, or other personal data were collected. To prevent the problem of missing data, participants cannot submit their answers before completing all the demographics and required questionnaire responses. After completion of this study, the research data collection module embedded in the app, as described in health monitor template[8], was removed so participants can use the app as long as they want.

Data analysis: Descriptive statistics were used to summarize the demographics. Chi-square and one-way analysis of variance were used to examine differences in demographics. Spearman’s and partial correlation tests were also used to examine the correlation between the score and one-question anxiety scale. Multivariate regression analysis assisted in describing the size of the change in SPIN score for a standardized unit change in the one-question anxiety scale.

RESULTS

Over five months from August 2012 through January 2013, 1,233 participants from the US, UK, Australia, and Canada who completed the questionnaire were included in this paper analysis. The majority of participants were female, with high school education level, and a relatively young mean age (Table 1). Chi-square analysis showed no significant differences between countries, in terms of gender $\chi^2(3, N = 1233) = 4.5$ $p = .21$, or education level $\chi^2(9, N = 1233) = 14.5$ $p = .10$. Furthermore, there was no significant difference between countries’ participants in term of age $F(3, 1232) = 1.19$, $p = .31$.

Table 1

Participants’ characteristics

Characteristics	n (%)
Age (mean (S.D)) (years)	28.7 (8.6)
Sex	
Female	828 (67.2)
Male	405 (32.8)
Countries	
Australia	148 (12.0)
Canada	102 (8.3)
United kingdom	304 (24.7)
United States	679 (55.1)
Education	
High School	668 (55.8)
Graduate (Bachelor)	242 (19.6)
Master Degree or higher	66 (5.4)
Others	237 (19.2)

Spearman’s correlation between SPIN scores and the one-question anxiety scale was reasonably high, at $r = .73$, $p < .001$, indicating a strong relationship between these measurement tools. In addition, as there were no significant differences between the countries in terms of participants’ gender, age, or educational level, after ensuring that there were no violation of the assumptions of normality, linearity, or homoscedasticity, a partial correlation was used to explore the relationship between SPIN score and the one-question anxiety scale. There was a strong, positive, partial correlation between SPIN score and the one-question anxiety scale, controlling for age, gender, country, and education, $r = .72$, $p < .001$, with high SPIN score being associated with a higher score on the one-question anxiety scale. An inspection of the zero order correlation ($r = .73$) suggested that age, gender, country, and education had very little effect on the strength of the relationship between SPIN score and the one-question anxiety scale. In addition, after controlling for age, gender, country, and education, regression analysis indicated that the one-question anxiety scale relates to the SPIN score in a comparable manner. The regression coefficients (beta), which describe the size of the change in

SPIN score per a standardized unit change in the one-question anxiety scale, which was 8.4 (95%CI: 7.8 - 8.4).

DISCUSSION

The result of the correlation between the SPIN score and the one-question anxiety scale was relatively high and does not seem to be affected by other factors such as age, gender, country, or education. The Consistent level of comparability between the one-question anxiety scale and SPIN, which has been validated to screen for anxiety in the general population and various age and gender groups, suggest that this one item scale can be used to measure anxiety adequately in similar situations. While the previous study evaluate the one-question anxiety scale only for female participants in a clinical setting, our study found it is suitable for both genders, without any significant effects to gender or age on the correlation score. In addition, our results are similar to Davey et al.'s results that compare the one-question anxiety scale to another anxiety scale (Spielberger State Trait Anxiety Inventory (STAI)). This again indicates that the one-question anxiety scale is fast and adequately measures anxiety when compared to two well-validated anxiety scales (SPIN & STAI). However, although the use of such scale is convenient in some situations, it is not an anxiety diagnostic test and its specificity and accuracy of diagnosing anxiety disorders compared to other anxiety scales has not been

established.

CONCLUSION

This study confirmed that the one-question anxiety scale is suitable to be used to measure anxiety in both genders. The reduction of the number of anxiety questions from 17 items to just one item will have a significant effect on the length of any questionnaire, its completion time, and response rate. However, using the one-question anxiety scale as such should be evaluated against the study's required level of sensitivity and accuracy.

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References

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