

APPENDICES

Appendix A.

Depression, Anxiety, and Stress Scale (DASS): Background and Scoring Information

DASS Background

The Depression, Anxiety, and Stress Scale (DASS) is a set of 3 self-report scales designed to enable researchers and clinicians to concurrently measure the emotional states of depression, anxiety, and stress.⁴⁹ According to the DASS Manual, the DASS Depression Scale assesses anhedonia, devaluation of life, dysphoria, hopelessness, inertia, lack of interest or involvement, and self-deprecation. The Anxiety Scale assesses autonomic arousal, situational anxiety, skeletal muscle effects, and the subjective experience of anxious affect. The Stress Scale assesses levels of chronic, nonspecific arousal. This includes: being easily upset or agitated, irritable or overreactive, and impatient, difficulty relaxing, and nervous arousal.

The DASS scales have shown high internal consistency and have yielded meaningful discrimination in multiple settings between the 3 dimensions of stress, anxiety, and depression.⁴⁹ The DASS has been validated by a number of studies that have included (but are not limited to) otherwise healthy individuals, depressed/anxious patients, absentee employees, and patients with rheumatoid arthritis.⁶⁰⁻⁶⁶

Since it is often desirable to administer as brief a survey as possible, a shortened version of the DASS scale (21 items) was developed, known as the DASS-21. The DASS-21 is also a set of 3 self-report scales (7 questions per category). The items included in the DASS-21 are shown in Table 12. These were selected to represent all subscales of the full DASS.⁴⁹ The DASS-21 has been applied and validated in multiple settings, including but not limited to otherwise healthy individuals, postpartum women, patients with spinal cord injuries, and elderly patients with chronic pain.^{11,50,60,64,67,68}

Respondents are required to respond to the DASS and DASS-21 by rating the degree to which each symptom was experienced over the past week. Therefore, the DASS is not directly applicable to the measurement of an individual's momentary emotional state (ie, how they feel right now).⁴⁹

The DASS scale has been compared with the Beck Anxiety Inventory and the Beck Depression Inventory.⁷⁰ In general, the correlations between the scales have been internally consistent.

DASS Administration and Scoring

The DASS instrument may be administered either in groups or individually for research purposes. The instructions that introduce the DASS scale read: "For each of the statements below, please circle the number which best indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any one statement."⁴⁹

Each of the 3 DASS scales contains 14 items (total items: 42). DASS respondents use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Overall scores are calculated by summing the scores of the relevant items. The shortened DASS-21 was designed in such a way that its scores could be converted to full-scale DASS scores by multiplying results by 2.⁴⁹

When the DASS is administered, its items are presented to subjects in random order with the following 4-point scale for each item:

- Did not apply to me at all = 0
- Applied to me to some degree or some of the time = 1
- Applied to me to a considerable degree, or a good part of the time = 2
- Applied to me very much, or most of the time = 3

DASS scale responses are coded from 0 ("did not apply...") to 3 ("applied to me very much..."). All 3 DASS/DASS-21 subscales are scored separately. The final scores are then calculated (DASS) or calculated, then doubled (DASS-21).⁴⁹

For most purposes, DASS/DASS-21 scores are interpreted relative to the means and standard deviations for the full normative sample of otherwise healthy individuals originally used to validate the DASS instrument. This normative data set is based on 6 normal sample groups, comprising 1044 males and 1870 females with an age range of 17 to 69 years. Comparisons between the scales are facilitated by conversion to Z scores using these normative values (shown in Table 13). For example, a score of 10 on the DASS Stress Scale is near average, but the same score on the anxiety scale is >1 standard deviation above the normative mean.⁴⁹

Appendix B.

Brain Child Advertisement Used to Recruit Survey Respondents

Dear **BRAIN, CHILD** readers:

- ☉ Are you the mother of a child between 6 months and 4 years of age?
- ☉ Would you like to participate in a brief survey to help identify issues and concerns that are *most important to you*?

If so, please take part in a 15-minute **academic research study**. To learn more, and to take the survey, please go to:

www.brainchildmag.com
or
<http://tinyurl.com/39upcg>

This study is being conducted by Caitlin Rothermel, MA, MPHc, in conjunction with the University of Washington School of Public Health and Community Medicine. Caitlin is a mother and graduate student and hopes that this project will expand current understanding on the experience of being a mother of small children in the United States.

This survey is for research purposes only. It is not affiliated with any commercial or marketing organization.
All responses are anonymous and strictly confidential.

 University of Washington
School of Public Health
and Community Medicine

Thank you, **BRAIN, CHILD**, for your support of this project!



Appendix C.

Survey Data Cleaning and Imputation Procedures

Initial survey data were obtained from 248 individuals between May 28 and November 4, 2008.

Elimination due to primary outcome unit non-response

Data were eliminated due to unit nonresponse for 3 respondents who answered "no" or did not provide a response to 1 of 3 qualifying questions:

- Are you a mother?
- Is at least one of your children older than 6 months, but less than 4 years (48 months) of age?
- To participate in this survey, you must be a U.S. resident. What part of the U.S. do you live in?

One respondent failed to answer any DASS-21 questions (primary outcome measure; unit non-response). Because DASS-21 scores were the key dependent variables used in this analysis, this respondent's data were eliminated. The final survey sample size was 244.

Imputation

DASS-21 non-response: respondents failed to answer 1-2 of the DASS-21 questions (primary outcome measure). For these respondents, missing variable imputation was conducted using existing respondent DASS-21 data within the relevant scale.

- DASS scale responses are coded from 0 ("did not apply") to 3 ("applied to me very much, or most of the time"). All 3 DASS-21 subscales (7 questions each) are scored separately. The final score is then doubled (DASS-21 scores need to be doubled).
- Maximum potential DASS score per scale: $3 \text{ (highest response per Q)} * 7 \text{ (# Qs)} * 2 \text{ (doubling of score for DASS-21)} = 42$.

To impute a response, the total score for the respondent scale containing missing data was calculated and a mean response identified.

- Example: Missing Q. I was intolerant of anything... From stress scale.
- Count for other stress scale responses: applied to me considerable degree (2 responses, score 2); applied to me very much or most of the time (1 response, score 3); applied to me to some degree (3 responses, score 1).
- Total scale score $(2*2)+(1*3)+(3*1)*2$.
- Total scale score = 22. Average score per Q (20/12): 1.66. Imputation for missing variable = 2.

Income nonresponse: Five respondents did not provide income information (5/243, or 2.1%). To impute missing data, a hot deck imputation as described by Groves et al⁷¹ was performed. Data were sorted by the parameters education, marital status, age (in that order) and a hot deck value was identified and applied, using replacement.

Racial/ethnic background nonresponse: One respondent did not provide this information. Imputation was performed based on survey mode (Caucasian, 92.2%)

Age nonresponse: One respondent did not provide this information. Imputation was based on the survey mean (35 years; this was also the median respondent age).

Spouse/partner work patterns nonresponse: Two respondents failed to indicate whether their spouse or partner worked. After confirming that both respondents indicated the presence of a spouse or partner, imputation by mode was conducted (yes-works full-time).

Disabled child(ren) living with respondent nonresponse: One respondent failed to answer this question. Imputation was based on survey mode (no, 94.3%).

Social support nonresponse: Two respondents did not answer 1 question apiece on this scale. Since the social support screener was only 4 questions long, no imputation model could be developed based on responses to similar questions in a sub-scale. Likewise, no other survey variables corresponded adequately with the social support analysis to support an alternate approach such as a hot deck procedure. Based on this, the analysis was conducted lacking these 2 missing data points.

Reasons for employment/non-employment nonresponse: On initial review, this section of the survey had the highest rate of non-response (18 items for unemployed; 22 for employed). It was also the only section where multiple items were not answered by a substantial proportion of respondents, indicating a potential non-response pattern. On close review, it was determined that some respondents misunderstood the section's directions. Respondents were asked to check either "yes" or "no" for all variables listed. In all cases where section data were missing, all inputs provided by the respondent were "yes." Therefore, the conclusion was drawn that, in cases where data were missing, respondents had intended to respond "no," and the data were adjusted accordingly.

Summary

Case-wide deletion of any respondent with missing data would have substantially reduced the amount of evaluable data (by 35 respondents). Because the overall study population was not large, imputation was used to insert missing data. The majority of respondents with missing data were only missing input on 1 survey item (22/23), while 1 respondent was missing data on 2 survey items. Imputation was successfully conducted in all these cases, except for social support non-response.