Food insecurity definitions and body mass index. Response

From MARTIN GULLIFORD, DEEPAK MAHABIR and BRIAN ROCKE

In his commentary on our recent paper, Dr Edward A Frongillo2 criticizes our use of a well-described household food security scale in Trinidad. There will always be some uncertainty concerning the application of a given measure as there is no perfect instrument to evaluate food security or dietary patterns in any population. The household food security measure was used in the US national Current Population Survey (which provided the comparison data used in Dr Frongillo’s commentary) but the application of the instrument to all groups in the multilingual, culturally diverse US population ‘has not been examined sufficiently’ (ref. 3, p. 8). Questionnaire evaluation must be considered when differences in literacy, language, dialect, or culture, as well as socioeconomic status, may influence responses and this consideration might suggest that an instrument should be tailored to local requirements. It is advisable, however, to be judicious in modifying such measures so as not to compromise the validity or comparability of an instrument. Departures from a previously tested template should only be undertaken to guarantee enhanced performance of a measure. Dr Frongillo’s comments appear to underestimate both the weight of evidence required to justify an alteration to an established measure and the limitations of local ‘validation’ studies. Before concluding that a measure gives unsatisfactory results in a given local population, or a particular group within a population, it is essential to ensure that the findings cannot be ascribed to error or bias. There is a relatively high risk that local questionnaire evaluation studies, implemented within the short time scales suggested, will lead to erroneous conclusions if sample sizes are too small or if subjects are insufficiently representative.

While our data suggested an unexpected difference in the frequency of food insecurity according to ethnicity, it would be premature to conclude that the instrument had differential validity in these groups. We had no prior hypothesis about ethnic differences in food insecurity. The study used cluster sampling with the selection of a relatively small number of neighbourhoods. Food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more. We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the household food security scale in each local setting, special consideration should be given to reviewing this item when the instrument is revised.

A potential for misclassification of food insecurity status does raise a concern that a possible true association between food insecurity and obesity might be attenuated. In order to explore this possibility, we repeated our previous analyses using the same methods but with two modifications to the classification of food insecurity. We first used a cut-point of three rather than two to identify subjects who were food insecure. We then omitted the ‘balanced meal’ item from the assessment of food

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insecurity, using a cut-point of two items out of five. The results are shown in the Table. As expected, the estimated prevalence of food insecurity was somewhat lower when the more restrictive definitions were used. The associations of food insecurity with over-weight (body mass index [BMI] \( \geq 25 \) kg/m\(^2\)) or obesity (BMI \( \geq 30 \) kg/m\(^2\)) were similar using each of the three definitions of food insecurity. Thus the test of our primary hypothesis concerning food insecurity and obesity was robust to varying the definition of food insecurity. The association of underweight (BMI \( < 20 \) kg/m\(^2\)) with food insecurity was somewhat sensitive to the definition of food insecurity, but this analysis was based on only 41 cases who were underweight. This again points to the need for a larger study.

A fundamental problem with locally developed instruments is that the ability to generate generalizable information may be severely compromised. The application of robust standardized questionnaire measures should generally be preferred to the proliferation of locally developed or locally adapted measures. Judgements on what is appropriate must be informed by knowledge of, and experience in, a given context. We doubt whether experiences from Bangladesh or Burkina Faso will have much relevance in the Caribbean region which has strong links with Europe and North America through geography, history, trade, culture, and language. Experience in the Caribbean shows that the importation of health-related measurement scales is feasible.\(^4\) Our report describes one of the first applications of a survey-based food security measure in the Caribbean. While our report raises several issues which require further investigation, the responses obtained using this instrument in Trinidad are, as Dr Frongillo indicates,\(^2\) ‘similar to those of the 1993 New York state sample’ (ref. 2, p. 516). The associations of food insecurity with lower incomes, physical disability, and low consumption of fruit and vegetables that we documented in our data, point to the validity of the measure and are consistent with those of other reports. Our survey has also provided the data required to formally analyse the properties of the short form household food security scale in the context of Trinidad and Tobago. In spite of the uncertainties ‘the US food security measure is understood to be broadly comparable across the US ... This comparability will likely hold in many other countries as well, but may not in some’ (ref. 3, p. 8).

References


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**Table** Frequency of food insecurity according to different definitions and associations with body mass index (BMI) category

<table>
<thead>
<tr>
<th>BMI category (kg/m(^2))</th>
<th>Total</th>
<th>‘Standard’ 2/6 items</th>
<th>‘Conservative’ 3/6 items</th>
<th>Excluding ‘balanced meals’ 2/5 items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq. (%)</td>
<td>OR (95% CI)</td>
<td>Freq. (%)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>&lt;20.0</td>
<td>14 (34)</td>
<td>3.21 (1.17, 8.81)</td>
<td>10 (24)</td>
<td>2.72 (0.95, 7.85)</td>
</tr>
<tr>
<td>20.0–24.9</td>
<td>38 (26)</td>
<td>–</td>
<td>27 (18)</td>
<td>–</td>
</tr>
<tr>
<td>( \geq 25.0 )</td>
<td>72 (26)</td>
<td>1.05 (0.61, 1.79)</td>
<td>46 (17)</td>
<td>0.87 (0.47, 1.60)</td>
</tr>
<tr>
<td>( \geq 30.0 )</td>
<td>35 (29)</td>
<td>1.08 (0.55, 2.12)</td>
<td>25 (21)</td>
<td>1.07 (0.51, 2.24)</td>
</tr>
<tr>
<td>Not known</td>
<td>10 (16)</td>
<td>–</td>
<td>7 (11)</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>134 (25)</td>
<td>90 (17)</td>
<td>103 (19)</td>
<td></td>
</tr>
</tbody>
</table>

\( a \) Frequency.
\( b \) Odds ratio.
\( c \) Relative odds of BMI category contrasted with 20.0–24.9 kg/m\(^2\) if food insecure, adjusted for age, sex, and ethnic group.
\( d \) \( P = 0.024 \).
\( e \) \( P = 0.064 \).
\( f \) \( P = 0.094 \).
\( g \) Note categories are not mutually exclusive.

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**LETTERS TO THE EDITOR**

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