LETTER to the EDITOR

Research Design, Statistical and Inferential Errors: Re: Oral Cancer Awareness of the General Public in Gorakhpur City, India

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Dear Editor

We have gone through the article, "Oral Cancer Awareness of the General Public in Gorakhpur City, India" (Agarwal et al., 2012) published in your esteemed journal with interest. However, after going through the article, we have found certain discrepancies, which are highlighted as under

Title of the article

The title of the article gives an impression of collection of information from city areas (urban), however, the findings depicted seem to have been collected from both city (urban) as well as town areas (rural). Lewis Mumford (1937) has clearly indicated that a city is a fundamental proposition of urban life. Moreover, in Table 1 of the article in question, the authors have shown 37.6% of their respondents to be rural, however, while describing the occupational profile only 146 (7%) respondents have been shown to have opted for the occupation "agriculture". As per the definitions of urban areas prevalent in India viz. "Specified towns with governments and places with 5,000 or more and at least three-fourths of the male labor force not in agriculture" (Haub, 2009) it is difficult to assume that 37.6% population is rural in nature and only 7% have agriculture as their occupation.

Disproportionate representation of sociodemographic groups

The authors have shown a very high proportion of their respondents to be teenagers (40.6%) (Table 1). More than three fourth of the respondents are within 30 years of age (40.6% + 34.5% = 75.1%). More than three fourth of respondents are males (77.1%) and nearly two-third of the respondents are students (63.2%). These are highly disproportionate sociodemographic groups and cannot reflect the population. The 2011 census data for Gorakhpur shows the population of Gorakhpur to be 671,048 with 353,550 males and 317,498 females (Census of India, 2011) thus showing a male to female ratio of 1000:898 whereas the findings of the article in question show a distorted sex ratio of 1000:297.

Doubtful occupational profile

Majority of respondents have been shown to be students (63.2%) while at the same time majority of respondents have been shown as graduates (52.5%). It seems highly unlikely that a population with so much of graduates (generally >20 years of age) has a very high proportion of non-working respondents.

Pattern of responses

The responses have been collected as "Yes", "No" and "Do not know", while raising a question like, "Do you know that Smoking is a risk factor for cancer" – Yes and No are the categorical responses while "Do not know" can only be termed as an extension of negative response and it is difficult to distinguish between response "No" and "Do not know" as separate entities unless the question is asked differently as "Do you consider smoking as a risk factor for cancer" where "Yes" and "No" are categorical and "Do not know" seems to be a dubious state of mind, however, in such a situation the question instead of giving information about knowledge level of respondent provides information on the perception levels.

Validity, reliability and acceptability

The authors have mentioned about assessment of the validity, reliability and acceptability of the questionnaire, however, no objective account of such validation, reliability assessment has been provided anywhere in the article. No attempt to validate the questionnaire either by test-retest validation, measurement of sphericity or internal consistency has been made, and hence the research tool is in general a crude tool for the given objective. We have specific reservations regarding the questions related with signs/symptoms – it is highly likely when the questions are framed such as "do you know growth of abnormal tissue is a symptom associated with oral cancer", the automatic response would be "Yes" as all the conditions on which questions were made were indicators of abnormality. The exact knowledge of the respondents could be evaluated only if some "False signs" have been intermingled with the correct responses and the respondents were given opportunity to select the correct signs and symptoms and a scoring would have been done on the ability to find out the correct number of signs/symptoms rather than being given the opportunity to answer "Yes", "No" or "Do not know".

Sedentary lifestyle as a risk factor of oral cancer?

One of the objectionable items on which knowledge levels of the respondents were assessed was inclusion of

"Sedentary Life style as a Risk Factor of Oral Cancer". To the best of our knowledge, till date there is no empirical evidence citing association of sedentary life style as a risk factor for oral cancer and its proposition as a risk factor for assessment of knowledge of respondents is an intellectual bankruptcy.

Incomplete and incorrect statistical information

Although most of the statistical comparisons have been provided in statement form with only limited information shown yet the information "except for the knowledge of oral cancer being preventable (t=1.52) which was highly significant (p<001)" seems to be highly misleading as at no degree of freedom a "t" value of 1.52 can yield a highly significant difference.

Discussion

The authors have failed to elucidate the association of knowledge level with age and education, they seem to emphasize that none of the respondents above 30 years of age were graduates – if so then in all likelihood the respondents of the assessment seem to be very customized and tailor made and hardly represent the demographic profile of a population. The genderwise differences in knowledge level also remain unaddressed given the traditional role of females in Indian society. Similarly inability to find out differences between urban and rural respondents has been left out unaddressed without any explanation. The findings in the questioned study indicate a high female-male and rural-urban equality in terms of knowledge related with oral cancer which is not in agreement with most of the available literature (Elango et al., 2009; Devediga and Prasad, 2010). It is difficult to assume that with a study with such strategic impact only two citations have been provided to substantiate the findings.

In conclusion, the authors seem to be confused while drawing the conclusion. In the conclusion segment under abstract they state, "the awareness of oral cancer in the high-risk population of Gorakhpur was not satisfactory, pointing to a need for further dissemination of information on this issue and its associated risks. This is especially important for the youngsters, as this may possibly help them keep away from the deleterious habit of tobacco indulgence in any form. If necessary risk factor cessation counselling should be provided". How can they draw such conclusion when out of 16 items on which enquiry was made, there were 9 items on which majority of respondents had provided correct responses (Table 1), throughout the study they state that youngsters had higher scores as compared to older age groups, however, they lay emphasis on dissemination of information to youngsters while sidelining the groups that they have proved to be lacking the information significantly.

Overall, the study seems to have ill representation of the target population, a poor measuring tool, casual approach and incorrect analysis and interpretation.

We would be glad if the authors present their point of view on the above issues so that proper direction might be given to future studies on the subject.

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