

# Establishing the Needs Assessment for Improving Dietary Assessment for Pakistani Population Evidence from Qualitative Study Findings

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## ABSTRACT

**Background:** Dietary assessment is one of the four major components of direct nutritional assessment. Several tools have been established for assessing the dietary intake of individuals as well as the communities. However, dietary intake is a complex exposure variable which is difficult to measure accurately. This study was conducted for needs assessment and suggestions of local dietary assessment tool users (clinical dietitians and researchers) regarding improvements in these tools.

**Methods:** Semi structured interviews were used to conduct this study. A total of ten participants selected using purposive sampling technique were interviewed after which data saturation was reached. The analysis was performed through transcription, meaning condensation, and then establishing data driven themes and patterns. The data thus obtained was represented in tabular and narrative format.

**Results:** Each interview took 45 minutes on average. Twenty Four Hour Recall (24HR) was the most commonly used tool of dietary assessment recorded in 13 out of 14 responses (92.8%) followed by Food Frequency Questionnaire (FFQ) recorded in 10 out of 14 responses (71.4%). A total of six themes emerged for the gaps associated with the use of dietary assessment tools as perceived by interview respondents.

**Conclusion:** Interview data collected from local nutrition and dietetic experts regarding perceived problems in dietary assessment showed that the dietary intake data can be subject to information bias which affects the overall quality of data set. There is a need to acknowledge these errors and find out localized solutions to reduce these errors for improving data quality.

**Keywords:** Dietary assessment; nutritional status assessment; qualitative interviews, information bias

## INTRODUCTION

**Background:** Accurate estimation of dietary exposures is highly crucial to collect valid data for studying nutrition and diet related risk factors (Reber, Gomes, Vasiloglou, Schuetz, & Stanga, 2019). The flaws in dietary assessment methods can generate misleading information and thus may impact on the interventions planned based on such information (Naska, Lagiou, & Lagiou, 2017). There are several dietary assessment methods and tools used for gathering data related to dietary exposures in the fields of nutritional epidemiology, public health as well as in the clinical settings. Prospective food records, 24 HR and FFQs have been regarded among the top three commonly tested tools in the previous literature. Estimated as well as weighed food records are the prospective techniques to minimize recall and interviewer's bias and are usually considered as gold standard against which validity of other tools can be found out (Food and Agriculture Organization of the United Nations, 2018). Data sets involving dietary history are highly contextual as sociodemographic characteristics, including culture, play a vital role in defining them. Therefore, localization of tools allows for more valid, reliable and feasible methods. Contextual findings are useful to direct the resources towards more demanding and crucial preventive interventions rather than leaving the already burdened economies further indebted to just the mitigation responses. Thus, the current study was carried out to collect localized data as a baseline to future research for improving the dietary assessment tools and their validation.

## MATERIALS AND METHODS

Semi structured interviews were selected to collect the data. Participant led interviews are a preferred source of information for establishing new and emerging themes (King, Horrocks, & Brooks, 2018). Recruitment of participants for interviews followed purposive sampling technique. Informants were selected based upon their reputation and expertise in the field of nutrition. Clinical dietitians as well as researchers and academicians in the relevant field were contacted through telephonic conversation. A total of ten participants were interviewed after which data saturation was

reached. The interviews were conducted online over zoom video conferencing ([www.zoom.us](http://www.zoom.us)). All the questions were asked and recorded using a semi-structured interview guide by the researcher via video/ audio meeting using this software. Each interview started with greeting the participants and providing a brief introduction about basic objectives of the research. General information related to educational and work experience was gathered. After that a semi-structured interview schema was used to guide the interview questions. Data analysis was based on the interpretivist approach which entails that active involvement of informants determines the social structure of data set (Saqib et al., 2018). For this purpose, data driven categories were established.

## RESULTS AND DISCUSSION

There were a total of 8 responses for preferred dietary assessment tools in clinical settings and 6 responses for preferred tools in research settings (Table1). Rest of the respondents did not have either clinical or the research experience to share. Four out of ten respondents (n=4) described their preferred tools in both research as well as clinical fields. Therefore, there were a total of 14 responses for preferred dietary assessment tools used in clinical and research fields combined.

Twenty Four Hour Recall (24HR) was the most commonly used tool of dietary assessment recorded in 13 out of 14 responses (92.8%) followed by food frequency questionnaire (FFQ) recorded in 10 out of 14 responses (71.4%). The 24-hour recall (24HR) is a retrospective method of dietary assessment which is used to gather information regarding the foods and beverages consumed in the past 24 hours and hints at the dietary habits of a person (Fagúndez et al., 2015). In addition to 24HR and FFQs, usual day recall, food diary, in depth interviews, 7 day recall were mentioned as their preferred tools by the respondents but they were less frequently reported.

**Expert opinions regarding perceived gaps in the currently used dietary assessment tools:** The purpose of collecting data using one tool is quite different from the other. Also, these tools are susceptible to different types of biases and errors (Lovegrove, Hodson, Sharma, Lanham-New, & Krebs, 2015) which are inherent

to each type of tool. A total of six themes emerged for the gaps associated with the use of dietary assessment tools as perceived by interview respondents. This data has been summarized in Table 2. These themes were classified into two major domains and were further categorized into several subthemes.

**a. Recognition of errors in currently used dietary assessment tools**

The presence of errors in currently used dietary assessment tools was well- recognized by the interview participants.

Q-R1: It is a fact that this is a problem that exists and thankfully it is being addressed and we are doing something about it.... It is a challenge and I think so nobody would deny it..

**b. Biases in dietary assessment tools**

The major biases highlighted by the interviewees were memory bias, recall bias, reporting bias and interviewer's bias. The tools of dietary assessment which are commonly used have retrospective administration. Memory bias and recall bias are quite common in such tools as they are reliant on memory of clients or research participants (Heikkilä, Vanhala, Korpelainen, & Tossavainen, 2021; Polfuss, Moosreiner, Boushey, Delp, & Zhu, 2018; Prinz et al., 2019). Also, people may not be able to recall/ report the correct recipes, ingredients or portion sizes of what they have consumed. It was highlighted by one of the interview respondent as:

Q-R3: If you are not going for food diary or record then you must incorporate some aspects in other tools as well for example if I tell you that I just had a bowl of salad and I don't tell you that it has a dressing of cream or fat and it had more salt.. so telling a bowl of salad does not tell what exactly I have consumed.. high in fat, high in sodium.

**c. Cultural differences in eating patterns**

Another theme about cultural differences in usage of dietary assessment tools emerged. Dietitians have to probe differently while dealing with people coming to them from different regions. Sometimes language barrier inhibits direct conversation with the client that may introduce a gap during history taking. Other times, there are differences in food items and habits of intake in people coming from different regions (Foster & Bradley, 2018). Such people need to be probed again and again in order to ensure that the dietary patterns are fully and accurately understood and recorded by the dietitian. This takes even longer time and more effort to execute a proper dietary assessment in such cases. Interviewer's skills form a major part of successful intake data collection.

Q-R7: in my hospital people come from far flung areas.. language barrier.. they don't know urdu or there is a translator for Pashto and siraiki speaking people.. I had much difficulty at that time.. Their foods are different and method of cooking too.. different combos.. They had large portion sizes. For a few times

children from another country. They also had different portion sizes, cooking methods and combos.

**d. Resource intensiveness of dietary assessment**

It was indicated by the respondents that out of the total time of interaction with the patient, majority of time is taken by history taking. Dietary assessment makes up most part of history taking. The dietitians were of the view that knowing the patient as much as possible before suggesting anything is a key to successful dietary recommendations and counseling. Some people may be already receptive and require less time for counseling than others. This information about readiness of patients, their general attitude and paradigm about life, habits and lifestyle is essential.

Q-R2: Most of time.. 45 minutes session 20-30 minutes (is spent on history taking), half of the time. Counseling takes more time sometimes when I talk to kids. Adults are more receptive. History taking takes much time.

**e. Problem in interpretation of dietary intake data**

The gaps are not only inherent in the tool themselves but are present throughout the process of administration till the time data is interpreted (Labonté et al., 2016). The tools of data collection are easy to understand and use but their interpretation becomes a challenge when nutritionists lack statistical knowledge. In addition, the interpretation and representation of dietary assessment data becomes challenging when the reference points are to be highly quantified when in actual the data set lacks the exact values. The reference points for differentiating household and standard measures are quite different. Converting household measures into standard measures sometimes becomes difficult through strict quantification.

Q-R9: the dietary assessment methods we learn about and we teach, they are very easy to understand.. 24HR, FFQ, Usual day recall.. but when we sit as a researcher.. how am I going to interpret this information. The biostats people get a solution, they ask what is the reference point against which it was measured and that is the same question we don't have an answer to.

**CONCLUSION**

Interview data was collected from local nutrition and dietetic experts to find out the perceived problems in dietary assessment tools in local context. It was found that the dietary intake data can be subject to information bias which affects the overall quality of information. Improvement in dietary assessment tools and methods can be helpful to establish better and more accurate nutrition-disease links for larger good.

**Competing Interests:** There is no conflict of interest

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Table 1: Interview responses on commonly used and preferred dietary assessment tools in the clinical and research settings (n=10)

Respondent	Preferred dietary assessment tools	
	Clinical settings	Research settings
1	a. 24HR b. Usual day recall	i. Used: FFQ ii. Preferred: a. In depth interviews on small sample b. Food record
2	i. Outdoor patient department a. Usual day recall b. Individualized FFQ for probing ii. Indoor department a. 24HR b. Past 7 days history	Not experienced public health/ epidemiological study in nutrition
3	i. Before consultation a. FFQ based questionnaire ii. After consultation a. 24HR b. Image assisted food diary to be sent to the counselor	Not experienced public health/ epidemiological study in nutrition
4	a. 24HR b. FFQ c. History about habits	a. Longer/ detailed version of 24HR b. FFQ depending upon objectives
5	No clinical experience	a. Interviewed 24HR b. Interviewed FFQ

6	a. 24HR with general lifestyle pattern b. Meal patterns questionnaire	a. 24HR b. FFQ
7	a. 24HR b. FFQ c. Usual day recall	a. FFQ b. 24HR
8	a. Usual day recall (lifestyle changes) b. 24 HR (acute problems)	No research experience
9	No clinical experience	a. 24HR b. FFQ based on objectives of study
10	a. Food diary for follow up patients b. 24HR	Not experienced public health/ epidemiological study in nutrition

Table 2: Problems and gaps associated with the use of dietary assessment tools as perceived by interview respondents (n=10)

Domain	Themes	Sub themes
Problems in data collection	Memory or recall Bias	<ul style="list-style-type: none"> <li>- Portion sizes</li> <li>- Food items</li> <li>- Recipe (ingredients and cooking methods)</li> </ul>
	Reporting bias	<ul style="list-style-type: none"> <li>- Client uncomfortable to tell certain things</li> <li>- Underreporting of certain items</li> </ul>
	Interviewer bias	<ul style="list-style-type: none"> <li>- Lack of interviewing skills</li> <li>- Difficulty in assessing emotions and attitude towards food</li> </ul>
	Cross cultural differences	<ul style="list-style-type: none"> <li>- Language barrier</li> <li>- Different recipes</li> <li>- Different food combinations</li> <li>- Different portion sizes</li> </ul>
	Resource intensive	<ul style="list-style-type: none"> <li>- Time</li> <li>- Effort</li> </ul>
Problems in data processing	Misinterpretation	<ul style="list-style-type: none"> <li>- Serving sizes</li> <li>- Household measures vs standard measures</li> <li>- Ingredients of food</li> <li>- Preparation methods</li> <li>- Application of biostatistics</li> </ul>

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