

Development and Validation of a Questionnaire Assessing Knowledge, Attitude, and Practices about Obesity among Obese Individuals

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Abstract

Aim: The objective of this study was to develop and validate a knowledge, attitude, and practice (KAP) questionnaire about obesity among obese individuals. **Materials and Methods:** The questionnaire was developed following a standardized protocol that consisted of literature review, focused group discussions, and expert opinion. A cross-sectional survey on 100 obese individuals was carried out to validate the tool. Exploratory factor analysis was performed, using principal component with varimax rotation, to establish the construct validity of the questionnaire. Internal consistency of the questionnaire was tested using Cronbach's α coefficient. **Results:** KAP questionnaire with 42 items categorized under three domains knowledge, attitude, and practices was developed. The KAP sections have 14, 15, and 13 items, respectively. Independent Cronbach's α for KAP domains were 0.75, 0.75, and 0.63, respectively, indicating good internal consistency. **Conclusion:** The developed questionnaire will be helpful in achieving better understanding of the patients' KAP about obesity. It has satisfactory validity and good internal consistency.

Keywords: Attitude, KAP Questionnaire, knowledge, obesity, practices

INTRODUCTION

Obesity is a severe, yet neglected public health crisis across the globe.^[1] Despite the increased attention being given to this problem, its prevalence is increasing steeply in both developed and developing countries.^[2] As the prevalence of obesity poses an enormous clinical burden, innovative treatment and care-delivery strategies are needed.^[3]

Lifestyle modification in the form of dietary intervention and increased physical activity can treat obesity up to a large extent.^[4] However, attaining clinically significant weight loss is always challenging for patients as well as physicians.^[5] Awareness and motivation are the basic needs to affect a change in behavior. KAP surveys in lifestyle-related diseases have become common in the community settings.^[6] It is important for physicians and metabolic experts to understand the KAP of obese individuals so that the factors that support an obesogenic environment can be addressed adequately. However, there is lack of validated KAP instruments focusing on obesity in Indian population.

Therefore, the objective of this study was to develop and validate a tool that will help health practitioners and experts caring for obese patients to understand obesity-related KAP of these individuals. This will enable them in adopting better treatment strategies to tackle obesity in their routine clinical practice.

MATERIALS AND METHODS

Standardized methodology was followed in the process of development and validation of the questionnaire that included steps such as literature review, focus group discussion (FGD), expert evaluation, pilot study, validation of the questionnaire, etc.^[7] The study was approved by the Institutional Ethics Committee of All India Institute of Medical Sciences,

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New Delhi, India, and all the participants gave written informed consent before their participation.

Development of questionnaire

It consisted of the following steps [Table 1]:

Item generation

Comprehensive literature review was done to look for concepts necessary for inclusion in the KAP survey. “MeSH” terms such as “obesity,” “knowledge, attitudes, practice,” “surveys and questionnaires” were used in PubMed and other medical search engines to look for studies done over past 5 years. Relevant papers were selected, and questions were identified from previous related questionnaires.

Focus group discussions

Literature review was followed by FGDs for subsequent addition of questions related to each concept. FGDs helped us understand how the target population perceives the subject of interest. Three sessions involving six participants in each were conducted by the primary investigator. Following the collection of unprompted information from the participants, more focused questions were asked to see if the respondents agree with the way the construct was developed. The data were analyzed qualitatively and new items were included in the construct.

A final construct of questions was developed, ensuring that items were nonoverlapping. Survey items were written in simple English language, which could be understood by the participants, referring to a single concept, expressed in first person, and avoiding double negatives. A 5-point Likert scale was used as response options, assuming equal distance between response objects.

Expert evaluation

The developed questionnaire after literature review and FGDs was subjected to expert validation by a team of eight experts (that included faculties from the Departments

of Medicine, Gastroenterology and Human Nutrition, Endocrinology and Metabolism, Clinical Psychology, and Biostatistics from our institution) for critical appraisals, inputs, and content validity. On the basis of their feedback, some items were deleted and no new item was added to the questionnaire.

Pretesting

The final draft of the questionnaire was pretested on 15 obese (BMI >25 kg/m²) participants. It was done to understand if there was any ambiguity in the participant’s interpretation of the developed questions. These participants completed the questionnaire and also commented on its clarity, construction, and relevance. Minor changes were made in the questionnaire as per their comments.

Validation of questionnaire

A survey was conducted to validate the questionnaire.

Participants and survey procedure

A total of 100 participants, aged 18–60 years, and body mass index (BMI) >25 kg/m² attending Medicine Outpatient Department from January 2017 to March 2017 participated in the study. The questionnaire was administered by the chief investigator.

Statistical analysis

Content validity, face validity, and construct validity of the developed questionnaire were examined. Content validity and face validity were established by expert evaluation and FGDs. Construct validity was established by exploratory factor analysis with varimax rotation to test the hypothesized domain structure and examine its substructure.^[8] Items with correlation coefficient >0.7 were omitted. Internal consistency was examined, but test/retest reliability could not be performed because of paucity of time. The homogeneity of the question items in each domain was evaluated using Cronbach’s α coefficient.^[9] A coefficient of 0.7 or higher is preferred for a questionnaire to be internally consistent.^[10]

Table 1: Steps involved in questionnaire development

Phases	Nature of activity	Methods	Number of domain	Name	Number of items	Response range	Addition or subtraction
I	Development of construct	Literature review	–	–	65	–	–
II	Development of construct	FGD	–	–	78	–	Addition of 13 items
III	Development of construct	Synthesize literature review and FGD	–	–	60	–	Subtraction of 18 overlapping items
IV	Item generation	Develop items	3	KAP	60	–	–
V	Establishment of face validity and content validity	Expert validation	3	KAP	42	5-point Likert scale	Removal of 18 items
VI	Cognitive interviewing	Pretesting	3	KAP	42	5-point Likert scale	–
VII	Establishment of construct validity	Item analysis and factor analysis	3	KAP	42	5-point Likert scale	No

RESULTS

Development of the KAP questionnaire

Comprehensive literature search with the keywords yielded 255 articles, out of which 136 articles were found to be relevant for our study. Relevant papers were studied and 65 items were generated for the questionnaire. The FGDs with participants led to addition of 13 items. After expert evaluation and removal of overlapping questions, 18 items were deleted, and 18 more items were removed during subsequent steps of questionnaire development and validation.

Validation

A cross-sectional survey on 100 participants was conducted to validate this tool. General characteristics of the participants are included in Table 2.

Content validity and face validity were achieved with expert evaluation and FGD. Construct validity was established by factor analysis. The fully answered questionnaires were subjected to item analysis to determine the construct of the tool. Correlation matrix was developed to look for degree of correlation. Sampling adequacy was established by Kaiser-Meyer-Olkin value (0.579) and the Bartlett test of sphericity (Chi-squared, $df = 861$; P value < 0.001), following which factor analysis was done, using the principal factor and varimax rotation to examine domain structure. Kaiser's criterion was used to enter the 42 items into the analysis. A total of 14 domains were identified after the factor analysis.

For determining the internal consistency of the questionnaire, Cronbach's α coefficient for the whole questionnaire was calculated, which found to be 0.78. Independent Cronbach's α for KAP domains were 0.75, 0.75, and 0.63, respectively. These values indicate good internal consistency.

The final questionnaire is in Box 1. The score key of the developed KAP questionnaire is available in Box 2.

DISCUSSION

The successful management of obesity is highly influenced by patients' education and motivation, which is largely governed by adequate KAP of patients. KAP is an important component

of the knowledge–attitude–behavior model, which proposes that accumulated knowledge about a health aspect initiates change in attitude, and results in gradual behavior change.^[11] Experts believe that appropriate knowledge about the disease and modification in the attitude and perception is extremely effective in treating lifestyle diseases.^[12] We have developed an easy to use and practical tool to understand the KAP of obese people toward obesity.

Researchers in the field of lifestyle diseases have conducted many KAP surveys for major lifestyle diseases such as diabetes,^[13] hypertension,^[14] metabolic syndrome,^[15] etc., These surveys have found that gap lies in the knowledge and attitude of the individuals, which is even more pronounced in their practice. Couple of KAP surveys have been done in the field of obesity also. In a KAP survey from Karachi, it was found that although patients had insight about obesity and intention to lose weight, but their practices toward balanced diet and regular physical exercise were inappropriate.^[16] Another KAP study on obesity from Bangladesh that involved type 2 diabetic patients reported that majority of participants were lacking proper knowledge about the disease. Majority of them were unaware about ideal body weight, energy requirement and weight measurement techniques. A substantial proportion of the respondents considered fast food, soft drinks and mayonnaise as healthier foods.^[17] Both studies have stressed the necessity of improving patient education programs for empowering persons to transform their knowledge and attitude into practice.

These studies have not provided KAP questionnaires for use by other researchers. It appears that the questions selected for interview from respondents were arbitrary and lacked scientifically approved procedure in its development and validation. The KAP questionnaire developed by us is well validated by following a standard protocol involving required medical and metabolic experts along with bio-statisticians. The questionnaire has 42 items under three domains; KAP consisting of five options designed on a Likert scale. The knowledge part of the questionnaire contains 14 items which emphasizes mainly on participants' knowledge regarding risk factors and complications associated with obesity. The attitude part of the questionnaire consisted of 15 questions designed to assess aspects such as perception of obesity and motivation to lose weight. The practice part of the tool with its 13 questions focused on their dietary habits and physical activity levels in their day-to-day life. It takes around 15 min to administer this questionnaire.

The strength of this tool is that it contains questions from all aspects that affect obesity such as diet (intake of sweets, refined foods, fried foods), eating patterns (meal frequency, meal skipping), physical activity (exercise duration, exercise frequency), lifestyle habits, motivation to lose weight, etc., Each question has five response items (a to e). The best possible response gets a score of 5 and the wrong response gets a score of 1. By analyzing the score of individual items, the physician or metabolic experts can

Table 2: Baseline characteristics of the participants involved in validation phase

Variables	Mean \pm SD
Age (years)	39.4 \pm 10.0
Gender (males:females)	51:49
Pulse rate	86.6 \pm 5.2
Blood pressure	
Systolic	127.1 \pm 10.7
Diastolic	77.9 \pm 8.6
Height (cm)	165.6 \pm 8
Weight (kg)	81.4 \pm 11.8
BMI (kg/m ²)	29.7 \pm 3.8
Waist/hip ratio	0.9 \pm 0.1

Box 1: Final version of the questionnaire

Questionnaire for assessment of KAP of obese individuals about obesity

Knowledge

1. Obesity can be assessed by an entity called BMI
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
2. More fat over abdomen is dangerous than overall increase in the distribution of fat in terms of causing increased cardiovascular problems
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
3. Obesity is associated with heart diseases, such as heart attack, increased blood pressure, increased cholesterol levels, etc.
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
4. Obesity is associated with diabetes
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
5. Obesity is associated with osteoarthritis (joint problems)
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
6. Fasting/skipping meals is a good way to lose weight
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
7. Excess sugar consumption in the form of sweets; additional sugars in coffee/tea/milk etc., is an important risk factor which leads to overweight/obesity
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
8. Frequent consumption of sugar-sweetened beverages (pepsi/coca-cola/sweetened juices, etc.) leads to weight gain
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
9. Frequent fried food consumption (samosa, fries, wafers, etc.) leads to weight gain
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not

Contd...

Box 1: Contd...

Questionnaire for assessment of KAP of obese individuals about obesity

- e) Don't know
10. Excessive consumption of refined foods (bread/biscuits/momos, etc.) leads to weight gain
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
11. Constant stress is a risk factor which leads to weight gain
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
12. Regular aerobic exercises, such as running, jogging, swimming, playing outdoor sports, etc., is an important way of losing weight
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
13. Anti-obesity drugs are the preferred way of reducing weight
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
14. Meal replacers/supplements are a healthy way to lose weight
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
- Attitude
15. I consider myself obese
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
16. I consider my current weight to be harmful for my health
- a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
17. I am motivated to lose weight
- a) Always
 - b) Very often
 - c) Sometimes
 - d) Rarely
 - e) Never
18. I find it difficult to keep my weight steady
- a) Always
 - b) Very often
 - c) Sometimes

Contd...

Box 1: Contd...

Questionnaire for assessment of KAP of obese individuals about obesity

- d) Rarely
- e) Never
- 19. I consider regular breakfast intake to be a part of healthy lifestyle
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
- 20. I consider small and frequent meals help in weight reduction
 - a) Definitely
 - b) Probably
 - c) Probably not
 - d) Definitely not
 - e) Don't know
- 21. I am confident that I would reduce sugars/sweets in my diet
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 22. I am confident that I would avoid fried foods
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 23. I am confident that I would prefer salads/low calorie snacks instead of sweets/fried foods/refined foods in my diet
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 24. I am satisfied of my current physical activity level
 - a) Very satisfied
 - b) Satisfied
 - c) Neither
 - d) Dissatisfied
 - e) Very dissatisfied
- 25. I am confident that I would do physical activities such as jogging, bicycling, swimming, competitive sports, or any other activity that makes me healthy
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 26. I am confident that I would engage in some sort of household activities when I am free
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 27. I am confident that I would use stairs instead of lift
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident

Contd...

Box 1: Contd...

Questionnaire for assessment of KAP of obese individuals about obesity

- d) Slightly confident
- e) Not at all confident
- 28. I am confident that I would go to nearby places by walk
 - a) Extremely confident
 - b) Very confident
 - c) Moderately confident
 - d) Slightly confident
 - e) Not at all confident
- 29. I feel sad/depressed considering that I am obese/overweight
 - a) Always
 - b) Very often
 - c) Sometimes
 - d) Rarely
 - e) Never
- Practice
- 30. I add additional sugars in my coffee/tea/buttermilk
 - a) Always
 - b) Very often
 - c) Sometimes
 - d) Rarely
 - e) Never
- 31. I take sweet dish after meals
 - a) Always
 - b) Very often
 - c) Sometimes
 - d) Rarely
 - e) Never
- 32. I use helpers for my household activities
 - a) Always
 - b) Very often
 - c) Sometimes
 - d) Rarely
 - e) Never
- 33. I eat in response to stress
 - a) All the time
 - b) Most often
 - c) Some of the time
 - d) Seldom
 - e) Never
- 34. I drink sugar sweetened beverages
 - a) Never
 - b) Rarely
 - c) 1-2/week
 - d) 2-3/week
 - e) >3/week
- 35. I consume fried foods
 - a) Never
 - b) Rarely
 - c) 1-2/week
 - d) 2-3/week
 - e) >3/week
- 36. How often do you take three major meals and two minor meals in a week?
 - a) All 7 days a week
 - b) 5-6 times a week

Contd...

Box 1: Contd...**Questionnaire for assessment of KAP of obese individuals about obesity**

- c) 3-4 times a week
 d) Once a week
 e) Never
37. Apart from the three major meals and two minor meals, how many snacks do you usually consume in a day?
 a) 0
 b) 1
 c) 2
 d) 3
 e) More than 3
38. I include fruits/salads in my diet
 a) More than once a day
 b) 4-6 times a week
 c) 1-3 times a week
 d) Once in 15 days
 e) Never
39. How frequently do you exercise?
 a) Everyday
 b) 4-6 times/week
 c) 1-3 times/week
 d) Once a month
 e) Never
40. For how long do you exercise in a day?
 a) Not at all
 b) <15 mins
 c) 15-30 mins
 d) 30-60 mins
 e) >60 mins
41. I consult my doctor/dietitian for weight reduction
 a) Always
 b) Very often
 c) Sometimes
 d) Rarely
 e) Never
42. Which of the following statements best applies to you.
 a) I currently exercise regularly and have done so for more than 6 months
 b) In the last 6 months I have started exercising regularly
 c) I currently exercise but not regularly
 d) I currently do not exercise and intend to start regular exercise in the next 6 months
 e) I currently do not exercise and do not intend to start regular exercise in next 6 months

identify the areas which need to be addressed while counseling the patient to make the treatment more effective.

This questionnaire can also be used by researchers to assess KAP at community level. The findings from subsequent studies can be helpful in developing strategies to modify the risk factors, and hence controlling this overgrowing epidemic. Besides, at individual level, this questionnaire will help practitioners to counsel their patients in a better way, making sure that the gaps in patients' KAP are addressed appropriately.

However, in studies of this kind, the items generated and the questions are affected by the responses of the participants. Since the study was done in North Indian setup, the questionnaire is affected by the habits of the local population. So, there may

be concerns regarding its applicability in other population groups that have an entirely different lifestyle. Besides, despite our effort to maintain balance between understandability, simplicity, and response bias, some questions are still oversimplified and somewhat leading in nature.

CONCLUSION

This study presents a new analysis of knowledge and attitudinal data on physical activity and dietary intake in obese individuals and investigates the factors that may be mediators of behavior change in these people. This KAP tool will be helpful in designing clinical and education interventions in Indian scenario in the field of obesity. It has satisfactory validity and internal consistency.

Box 2: Score key of the questionnaire

Score key

Questionnaire for assessment of knowledge, attitude and practice of obese individuals about obesity

Scores range from 1 to 5

Each question has five options (a, b, c, d, e)

For questions 6, 13, 14, 18, 24, 29, 30, 31, 33, 40

a=1

b=2

c=3

d=4

e=5

For questions 1,2,3,4,5,7,8,9,10,11,12,15,16,17,19,20,21,22,23,25,26,27,28,32,34,35,36,37,38,39,41,42

a=5

b=4

c=3

d=2

e=1

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Conflicts of interest

There are no conflicts of interest.

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