Waist circumference measurement: knowledge, attitudes and barriers in patients and practitioners in a multi-ethnic population

Alison J Dunkleya, Margaret A Stonena, Naina Patela, Melanie J Daviesb and Kamlesh Khuntia


Background. Currently, body mass index (BMI) is widely used to identify health risk due to overweight or obesity. However, waist circumference is considered by many to be a better indicator of health risk than BMI. The primary health care team are ideally suited to screen for people at high risk of glucose intolerance and increased cardiovascular risk using waist circumference measurement (WCM).

Objectives. To determine the knowledge and attitudes of patients and primary care practitioners concerning WCM, with particular reference to exploring barriers in a multi-ethnic setting.

Methods. A qualitative study using purposive sampling, semi-structured interviews and thematic analysis was conducted. Nine general practices were selected from Leicestershire, UK. The participants were 10 practitioners (four practice nurses, six general practitioners) and 18 patients (six south Asians).

Results. Two overarching themes were identified from patient and practitioner interviews: understanding of waist size measurement to assess or monitor risk and attitudes related to perceived barriers and facilitators to waist measurement. A few practitioners felt uncomfortable about carrying out WCM and some perceived that patients might feel embarrassed. Practical barriers raised by professionals included lack of time, extra workload and financial implications. In contrast, patients generally raised few barriers to WCM. Being given an explanation appeared to be what was most important to them. No clear differences emerged when comparing views of patients from different ethnic groups or general practitioners and practice nurses.

Conclusions. This study adds to our understanding of views on WCM in a multi-ethnic setting, highlighting factors for consideration if WCM is to be facilitated in routine practice.

Keywords. Abdominal obesity, body mass index, cardiometabolic risk, primary care, waist circumference.

Background

Obesity is associated with an increased risk of developing type 2 diabetes and cardiovascular disease (CVD), and it has been suggested that strategies to combat the predicted rise in incidence of diabetes and associated vascular complications should focus on screening and prevention. Currently, body mass index (BMI) is widely used in clinical practice to identify individuals with a health risk due to being overweight or obese. However, some studies have shown that waist circumference is a better indicator of future risk than BMI and waist-to-hip ratio. Waist circumference is the anthropometric measurement most closely correlated with visceral adipose tissue and central adiposity.

The primary health care team are ideally suited to identify risk using waist circumference measurement (WCM), but this assessment is not routinely carried out in general practices. A recent survey suggests that
only 12% of practice nurses (PNs) in England measure waist circumference in a typical week compared to 96% who measure BMI, but currently there is a lack of research evidence relating specifically to practitioner barriers to carrying out WCM. There is also a lack of knowledge about patients’ understanding of the importance of waist size. Evidence from a recent study suggests that very few people know what the cut-off point is at which waist size confers an increased health risk. However, this was a questionnaire survey and people’s knowledge and views were not explored in depth.

There is an increasing body of evidence that certain ethnic groups are at higher risk of developing diabetes and CVD, and that abdominal obesity may be an important contributing factor. In south Asian (SA) populations, abdominal adiposity is much higher compared with many other ethnic groups (including Caucasians) for a given waist size. Despite this, there is limited research evidence relating to the use of WCM to detect increased risk in migrant populations including SAs. This includes a lack of information regarding potential cultural barriers.

We aimed to elicit and explore the views of both patients and primary care health care professionals (HCPs) towards waist size measurement, including identification of possible barriers to carrying out this assessment in a multi-ethnic setting.

Methods

Design

A qualitative study using purposive sampling and in-depth, semi-structured interviews was conducted. We set a provisional quota of recruiting 10 HCPs and 20 patients to enable us to capture a range of views with the final number to be based on reaching saturation in terms of the emergence of new themes. All general practices in Leicestershire, UK, were sent an invitation to participate and general practices were selected from those who volunteered. The final sample of nine practices was based on including a range in terms of list size, urban or rural location, ethnic background of patients, teaching/training status and the number of GPs and PNs working at the practice. Subsequently, interviewees were recruited by letter or in person from the selected practices. At practices with a high proportion of people of SA ethnicity on their register, Gujarati translated versions of the recruitment documents were also supplied.

All GPs and PNs in participating practices were eligible to take part. Patients were required to be able to speak and understand English and/or Gujarati, and to be aged 25–75 years, as this is the likely age range to be included in any screening programme. For both professionals and patients, a sampling frame was used to purposively select a diverse sample to be interviewed from those who volunteered, based on the characteristics shown in Tables 1 and 2.

Data collection and recording

Topic guides were developed through discussion within the research team and input from HCPs and patients (the latter being represented by administration and support staff from within our academic department). Both stakeholder groups consulted included people from a range of ethnic backgrounds.
including SAs. Draft versions of the topic guide were piloted and these were revised as any new issues emerged from the interviews. The topics included for discussion are outlined in Table 3. Interviews were conducted between October 2007 and April 2008. Written consent to participate in the study was obtained from participants immediately prior to the interview. All interviews were audio-recorded and conducted by AJD or NP, who additionally kept reflective diaries. Interviews were transcribed verbatim, with simultaneous translation from Gujarati to English where appropriate.

Data analysis
Transcripts from patient and practitioner interviews were analysed separately and the results subsequently compared. A constant comparative approach was adopted throughout. To develop an initial coding frame, three HCP interviews and three patient interviews were open-coded independently by two members of the research team (AJD, MAS), either manually or using QSR-N6 free nodes. Progressive focusing was then carried out in order to develop descriptive and conceptual (interpretive) categories. The coding scheme developed was then used as a guide to systematically code the other interview transcripts using QSR-N6. In line with our constant comparative approach, as transcripts were analysed, the coding frame was modified in response to new data. Exploration and interpretation of the coded data involved two researchers (AJD, MAS) to ensure validity and included comparison of themes and concepts. We purposively examined whether the views of GPs were different from those of PNs and whether there were differences between SA and white European (WE) patients.

Results
Characteristics of the sample
Interviews were conducted with 18 patients (three SAs) and 10 HCPs, in line with our quota sampling frame. The SA patients interviewed were all from the local Gujarati Hindu community, of whom two opted to be interviewed in Gujarati, suggesting a lesser degree of acculturization. Tables 1 and 2 show additional details of characteristics of the sample interviewed.

We identified varying experiences of the types of patients targeted for WCM by HCPs, the method used and the frequency of measuring waist size. Only one practice routinely carried out WCM for all patients but a few practices measured waist size in specific patient groups, usually for people with diabetes or for obesity management. Most patients had no experience of WCM by an HCP but some had been measured by a family member or a tailor in relation to buying or fitting clothes. Generally, patients had limited experience of measuring their own waist.

Themes identified from the interviews
Two overarching themes were identified from the patient and HCP interviews: understanding of waist size measurement to assess or monitor risk (Theme 1) and attitudes related to perceived barriers and facilitators to waist measurement (Theme 2). Overall, no clear differences emerged when comparing the views of SA and WE patients or GPs and PNs. Quotations to illustrate Themes 1 and 2 are shown in Tables 4 and 5, respectively.

1. Understanding of waist size measurement to assess or monitor risk

Generally, PNs and GPs demonstrated, without specific prompting, an awareness of the link between a large waist size and risk of diabetes. A link with CVD was less frequently mentioned spontaneously but was generally acknowledged after prompting. However, the concept of central obesity and its association with risk was less commonly raised. Most HCPs suggested specific values for a healthy waist size but there was a high level of variation (74–88 cm cited

<table>
<thead>
<tr>
<th>Table 3 Areas for possible discussion included in the interview topic guides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics for discussion with patients</td>
</tr>
<tr>
<td>Previous experience of body shape/size assessment</td>
</tr>
<tr>
<td>Knowledge of the importance of waist size and associated health risks</td>
</tr>
<tr>
<td>Emotional feelings related to being measured</td>
</tr>
<tr>
<td>Potential barriers</td>
</tr>
<tr>
<td>Perceived usefulness of measurement</td>
</tr>
<tr>
<td>Topics for discussion with HCPs</td>
</tr>
<tr>
<td>Assessment of obesity related health risks</td>
</tr>
<tr>
<td>Knowledge of waist size as a risk factor</td>
</tr>
<tr>
<td>Feelings related to measuring patients</td>
</tr>
<tr>
<td>Perceived barriers</td>
</tr>
<tr>
<td>Usefulness of waist measurement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4 Quotes for Theme 1: understanding of waist size measurement to assess or monitor risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 1: understanding of waist size measurement to assess or monitor risk</td>
</tr>
<tr>
<td>• ‘I do know that as you get older your fat sort of settles here, okay, and that’s as much as I know, I don’t know how dangerous it is or whether you should be aware of it’ (PT, 08, F).</td>
</tr>
<tr>
<td>• ‘Only what’s coming up on the, in the, media now about heart disease’ (PT, 16, F).</td>
</tr>
<tr>
<td>• ‘I have been in contact with a lot of fat people, they’ve never had no problems and I mean not just fat, but fat as in fat. They’ve never had no problems so the two don’t connect’ (PT, 01, M, SA).</td>
</tr>
<tr>
<td>• ‘Well I know some blokes who have got big stomachs and that, and they’re as fit as fleas, you know what I mean’ (PT, 07, M).</td>
</tr>
</tbody>
</table>

Interviews are coded as follows for patients: PT, interview number, gender (M/F), SA if south Asian.
TABLE 5 Quotes for Theme 2: attitudes related to perceived barriers and facilitators to waist measurement

Theme 2: attitudes related to perceived barriers and facilitators to waist measurement

Standardization and training needs

′I mean it sounds quite easy on the face of it but some people, it can be quite difficult in some patients . . . so a written instruction and standardisation of how to measure it will be helpful′ (HCP, 07, GP).

′If I get a patient that moves in, how do I know that their waist measurements from the previous surgery are conducted the same way we’re doing here′ (HCP, 08, PN).

Perceived usefulness

′BMI is just a figure, it doesn’t tell their right risk factor . . . if you are going to target obesity without waist circumference what are you looking at?′ (HCP, 02, GP).

′Yeh, well I think the BMI is important but that’s not everything. I think you should take (it) in context with the BMI′ (HCP, 07, GP).

′Take your clothes off and stand in front of a mirror if you want to know whether you’re fat or not′ cos that’s all you need to do really. It’s pretty damned obvious normally′ (HCP, 03, GP).

′I don’t think people are as aware of waist circumference measurement as they are of weight′ (HCP, 06, GP).

′Not a lot of patients know that it is important . . . you have to sell it′ (HCP, 14, GP).

′They go oh my goodness I used to be a thirty-six, you know. It sometimes can bring them up short and make them think actually I should do something about this. We’ll chat about what it is a healthy diet and what goals to make′ (HCP, 13, PN).

′The earlier I can find something that’s wrong with me and start treatment to get it put right, the better. So yeah, the more examinations the better, so far as I’m concerned′ (PT, 13, M).

′Well it might get me to look at my diet . . . and try to lose some weight you know′ (PT, 04, F).

′They can assess your health, what you are or what problems it can create in the future′ (PT, 19, M, SA).

Personal feelings

′It’s personal to go up and start putting your arms around a patient′ (HCP, 10, PN).

′I think it’s less invading for a patient to have them standing on a scale than to measure their waist circumference′ (HCP, 06, GP).

′All your women that have babies and have ended up with massive stretch marks . . . even those with normal weight don’t like revealing themselves′ (HCP, 13, PN).

′Not many will say no but if they are really obese they won’t feel nice so . . . you have to make them comfortable and if I am in their place I won’t feel comfortable, I won’t come to my clinic again because it’s very embarrassing′ (HCP, 01, PN).

′A big Asian lady, . . . I mean it would be easier to weigh her and she wouldn’t mind that. To ask her to remove her clothes, well . . . she would need to ring the husband to get permission for you to do that′ (HCP, 14, GP).

′Depends on the individual circumstances. Some patients don’t care, but if you’re a Muslim woman and very strict about it you wouldn’t want anybody other than a woman touching you so it depends on your individual ethnic preferences and your personal preferences as well′ (HCP, 03, GP).

′Depends on their person . . . and their culture you know er . . . some of the women not wanting to expose themselves all the time but erm . . . I would still be able to do it′ (HCP, 13, PN).

′I wouldn’t feel anything about it, wouldn’t think about it cos they are doing their job and that’s it′ (PT, 19, M, SA).

′Wouldn’t bother me . . . Don’t have a problem with it at all′ (PT, 08, F).

′I wouldn’t be happy if I’d gotta take a skirt or trousers too far down . . . I don’t mind it being on my waist but I’m not sure I’d want to strip off for that′ (PT, 10, F).

′A bit embarrassed . . . I’m a bit podgy round the waist now′ (PT, 04, F).

Table 5 continued

Theme 2: attitudes related to perceived barriers and facilitators to waist measurement

′I’d be more comfortable with a female, but it wouldn’t matter if there was just you know a male available, but I would prefer a female′ (PT, 10, F).

′I would expect them to tell me that without me having to ask, you know. I’d like to measure your waist because, you know, and this is how we’ll do it′ (PT, 08, F).

′I’d agree as long as they were telling me why they were doing it . . . you know, so there was a reason′ (PT, 16, F).

Practical considerations

′Time constraints in consultations if you wanted to do it in consultations′ (HCP, 03, GP).

′I wouldn’t mind but it’s extra work for me . . . there’s so much pressure of work . . . workload will increase a lot you know′ (HCP, 01, PN).

′You don’t just take the measurement, you have to explain what it means so in itself it doesn’t take a moment does it, but then you’ve got quite a good length of topic of conversation to explain it′ (HCP, 06, GP).

′Well if it ends up as a QoF point no doubt it will be done because they’re worth a lot of money . . . I don’t think it would be done voluntarily′ (HCP, 06, GP).

Interviews are coded as follows for patients: PT, interview number, gender (M/F), SA if south Asian. Interviews were coded as follows for health care professionals: HCP, interview number, profession (GP/PN). for females and 90–100 cm for males). Awareness of ethnic specific recommendations for waist size due to increased health risks in certain groups was poor.

Around half of all patients interviewed demonstrated no knowledge of the importance of waist size or of any associated health risks. Additionally, some patients remarked that people who have a large waist size or who are overweight are not necessarily unhealthy. In some cases, this perception appeared to lead to denial of the link between body size and health.

2. Attitudes related to perceived barriers and facilitators to waist measurement

Issues emerging from the patient and HCP interviews in relation to perceived barriers and facilitators were categorized as a number of subthemes as presented below.

Standardization and training needs. Most HCPs indicated that they had not received any specific training in how to carry out WCM. Concerns related to the need for training included difficulties in positioning the tape, lack of repeatability, operator variability and interpretation of results. A commonly raised issue was the need for a standardized and nationally accepted method.

Perceived usefulness. The majority of HCPs felt that WCM was more useful than BMI or that it was
advantageous to carry out this assessment as well as BMI. However, the view was also expressed that there may be no need to measure body size at all. Differing views were expressed by HCPs regarding the perceived usefulness of waist measurement to patients. Some felt that patients are not familiar with waist size and may not understand how it relates to risk, while others thought that a waist measurement was something that could motivate patients to make lifestyle changes.

When the topic of using WCM to predict risk was raised with patients, the majority felt that having their waist size measured would be useful for themselves in terms of identifying health problems, getting advice and facilitating positive lifestyle changes. Overall, patients also thought that it would be beneficial for their doctor/nurse to know their waist size.

**Personal feelings.** For some HCPs, the perceived intimate nature of WCM appeared to present a barrier, although for others this was not an issue. The degree to which HCPs felt comfortable about WCM appeared to be positively related to the increased experience of measuring waist size and to routine rather than ad hoc use of this measurement and negatively associated with patients being overweight or obese. HCPs also perceived that patients might feel uncomfortable or be embarrassed about having their waist measured. Furthermore, a few HCPs demonstrated preconceived ideas about cultural groups, specifically SA women, for example in relation to removal of clothing.

In contrast, most patients, including SAs, said that they did not think that they would be embarrassed or feel uncomfortable about having their waist measured. Two patients, both WE females, expressed concerns when they were asked specifically about loosening or removing any clothing, although there was no indication that this would lead to them refusing to have their waist measured. In addition, a few women, both SA and WE, cited a preference for being measured by a female HCP but this was not seen as essential, and the need for a chaperone was not perceived as important. Overall, what appeared most important to patients was that the HCP should provide them with an explanation of what the measurement involved and why it was being conducted.

**Practical considerations.** Time was specifically mentioned as a barrier by the majority of HCPs in relation to the length of appointments and the extra workload involved if measurements and associated discussions were to be carried out regularly. The topic of finance was frequently raised by HCPs either as a barrier in terms of cost implications for the practice or when asked about possible methods of encouraging the use of WCM. Three people, all GPs, specifically mentioned inclusion of this assessment in the Quality and Outcomes Framework (QoF)\textsuperscript{15} as a potential incentive. In addition, some HCPs suggested organizational incentives for carrying out WCM. These included the addition of waist circumference to all patient templates, targeting new patients, or policy changes at practice or primary care trust (PCT) level.

Practical considerations mentioned by patients were generally related to concerns about having their waist measured when they were not expecting to have this assessment. These concerns included perceptions about hygiene, for example in terms of showering before the appointment; the need to wear appropriate clothing; time implications if the assessment added to the length of the appointment and a perceived need for the opportunity to consider whether it would be appropriate to bring children to the appointment.

**Discussion**

**Summary of main findings**

In the sample we interviewed, no clear differences emerged when comparing the views of patients from different ethnic groups or GPs and PNs. Health professionals were generally aware of a link between a large waist size and health risks but had not received specific training in how to carry out WCM and did not routinely carry out this assessment. Most felt that there were advantages to using WCM alongside or instead of BMI but a few felt uncomfortable about carrying out WCM and some perceived that patients might be embarrassed. Practical barriers suggested included lack of time and extra workload. Financial implications were seen as both a barrier and a potential incentive.

Around half of all patients interviewed had no previous knowledge of the importance of WCM, although during the discussion the majority indicated that having their waist size measured would be useful for both themselves and their doctor or nurse. Generally, patients perceived a lack of embarrassment about WCM although a few women expressed a preference for a female to measure them. What appeared most important to patients was being provided with an explanation of what the measurement involved and why it was being carried out. Practical barriers for patients were related to having the measurement carried out without prior warning.

**Comparison with other studies**

A small number of quantitative studies have considered knowledge and experience of WCM, but there is a lack of qualitative evidence. A large survey which included the UK suggested that only 58% of primary care physicians recognize that abdominal obesity is a significant risk factor for heart disease.\textsuperscript{9} Although an association between a large waist size
and CVD was not frequently mentioned spontaneously by the HCPs we interviewed, this link was generally acknowledged after prompting. However, the concept of central obesity was not commonly raised by our HCPs and results from a survey of practitioners in Scotland similarly suggest that GPs’ and PNs’ awareness of the link between waist size and intra-abdominal obesity is poor. In addition, around half of the patients we interviewed demonstrated a lack of any understanding of the importance of waist size in relation to health risks. Previous cross-sectional evidence also suggests that few patients know what the cut-off point is at which waist size confers an increased risk.9

Other authors have highlighted patient concerns about other physical examinations such as breast,17 rectal18 and genital examination15 and cervical screening,17,19,20 but there is a lack of literature related directly to patient attitudes to WCM. In our study, patients did not perceive the need for a chaperone for WCM and this is consistent with a questionnaire study conducted in primary care in the USA which found that although patients indicated a preference for a chaperone for some examinations, it was not seen as necessary for examination of the heart/lungs and abdomen.21

Some of the practical considerations raised as potential barriers to carrying out WCM by the HCPs we interviewed show similarities with the results of two previous cross-sectional studies examining implementation of evidence-based recommendations, that is lack of time,22 including time limitations associated with a heavy workload and lack of reimbursement.23

Strengths and limitations

Our use of sound qualitative methodology, including purposive sampling and a flexible topic guide, ensured that we collected data from a range of people and enabled us to explore in depth their views and experiences. We acknowledge that the group of administration and support staff used to represent patients’ perspectives during the development of a topic guide was a non-representative group. However, this opportunistic sample enabled us to test the appropriateness of the proposed lines of questioning on people without a HCP background and the actual sample of patients interviewed for the study itself was drawn widely from people attending general practices.

A further strength of our study is inclusion of the views of both practitioners and their patients, although we involved only GPs and PNs rather than a wider range of HCPs. Previous cross-sectional evidence suggests that dieticians are more aware of the importance of waist size to intra-abdominal obesity than GPs and PNs.16

By including patients from different ethnic groups, our study provides insight into relevant attitudes in a multi-ethnic setting. However, it is acknowledged that people from minority ethnic backgrounds living in the UK are not a homogenous group. Our sample of Gujarati Hindus represent a specific subgroup of migrant SAs and the transferability of our findings to other subgroups of SAs and other ethnic groups would need testing through further research. For example, it may be surmised, though it should not be assumed, that Muslim women might have different attitudes to having their waists measured. Indeed, one of the HCPs interviewed in our study suggested that Muslim women might not want anybody other than a woman touching them (HCP, 03, GP). However, as our study has shown in relation to potential embarrassment, HCPs’ perceptions about the attitudes of their patients are not necessarily an accurate reflection of the views expressed by patients themselves.

Implications for clinical practice and future research

Recent guidelines on vascular risk assessment published by the National Screening Committee recommend including WCM in risk assessment both for population-based screening and screening those at risk.3 The National Institute for Clinical Excellence also recommends that WCM may be useful in addition to BMI for obesity management in some people.24 Additionally, recent research suggests that people who are overweight are increasingly likely to fail to recognize their body size as a cause for concern.25 Waist measurement and discussion of associated risks as part of appropriate consultations could provide an opportunity to address this issue. This is an area of research focus for some current trials looking at primary prevention of diabetes and CVD.26

Despite this interest in waist measurement, WCM is not routinely carried out in primary care. If the use of WCM is to be facilitated in routine practice, barriers and facilitators highlighted by our patient and HCP interviews should be considered. There is a clear need for training in how to carry out WCM, and if HCPs feel embarrassed or uncomfortable about this assessment ways of addressing, this should be included. Further considerations include adopting a standardized method for WCM, increasing the length of patient appointments and recognition of workload implications at both practice and PCT level. Potential facilitators include the use of financial incentives and/or possible inclusion in the QoF. Implications for practice that relate directly to patients include the need for HCPs to provide patients with an explanation of the importance of WCM and what it involves. Additional concerns are ensuring that patients feel comfortable about being measured, possibly providing them with a choice of the gender of HCP, and planning when the measurement is to be carried out so that patients can address any barriers related to the measurement being unexpected.
Acknowledgements

We would like to thank the general practices and the individual doctors, nurses and patients who contributed to this study. All authors contributed to the drafting and revision of the manuscript and approved the final version for publication.

Declaration

Funding: Royal College of General Practitioners, Scientific Foundation Board (SFB/2006/09).

Ethical approval: The study was conducted in accordance with the approval granted by Leicestershire, Northamptonshire and Rutland NHS research ethics committee and the Leicestershire, Northamptonshire and Rutland Primary Care Research Alliance.

Conflicts of interest: KK and MJD are authors of the UK National Screening Committee ‘Handbook for vascular risk assessment, risk reduction and risk management’.

References

14 Misra A, Wasir JS, Vikram NK. Waist circumference criteria for the diagnosis of abdominal obesity are not applicable uniformly to all populations and ethnic groups. Nutrition 2005; 21: 969–76.