Ogden, J and Flannagan, Z. (2008). Beliefs about the causes and solutions to obesity: A comparison of GPs and lay people. Patient Education and Counselling, 71; 72-78.

Beliefs about the causes and solutions to obesity:

A comparison of GPs and lay people

Jane Ogden and Zakk Flanagan

Department of Psychology, University of Surrey

Address for correspondence:

Jane Ogden
Professor in Health Psychology
Department of Psychology
University of Surrey
Guildford
Surrey
GU2 7XH
UK

Tel: 01483 686929

Email: J.Ogden@surrey.ac.uk

Abstract

Objective: To explore GPs' beliefs about the causes and solutions to obesity, to compare them to those held by a lay sample and to assess the role of beliefs about causes in explaining beliefs about solutions. Methods: Questionnaires regarding the causes and solutions to obesity were completed by GPs (n= 73) and a lay sample (n=311). Results: GPs generally believe that obesity is caused by psychological and behavioural factors and are ambivalent about the effectiveness of the majority of available solutions. When compared to a lay population, GPs show a greater endorsement of behavioural, structural, social and psychological causes of obesity whereas the lay population prefer a more biological model of causality. The present study also provides some evidence for the origins of such beliefs about solutions and indicates consistency between GPs' beliefs about solutions and causes. For example, GPs endorse a medical solution if they believe obesity is caused by biological factors and endorse policy change as a solution if they believe it is caused by social factors. The lay sample did not show such consistency in their beliefs. Conclusions: GPs believe that obesity does not belong within the medical domain. They hold a coherent model in terms of beliefs about causes and solutions which may limit their perspective on what constitutes a suitable solution to this ever common problem. Practice implications: If GPs are to take responsibility for the management of obesity they should be encouraged either to change their beliefs or to consider whether solutions need always address causality.

Key words: obesity; GPs' beliefs; lay beliefs; solutions; causes.

1. Introduction

The increase in both adult and child obesity has been well documented (1,2). As a means to explain this increase, researchers have focused their attention on the role of the obesogenic environment and have highlighted the importance of factors such as the food industry, food advertising, food labelling, the availability of energy dense foods and an environment which has been increasingly designed to encourage a sedentary lifestyle through the use of cars, computers and television (3). Obesity has been associated with a range of physical and psychological problems including cardiovascular disease, diabetes, joint trauma, cancer, hypertension, mortality and low self esteem, poor self image and depression (4,5). As a result of these problems psychologists, nutritionists, dietitians and endocrinologists have been involved in the development of treatment programmes for obesity. Recently, however, the management of obesity has become an increasing focus for primary care and members of the primary care team are involved in weight loss clinics, the provision of dietary and weight loss advice as part of diabetes clinics or new patient health checks, and the provision of weight related information given opportunistically as part of a consultation apparently unrelated to obesity. However, in spite of these efforts although short term weight losses have improved over the past forty years (6) the longer term success rates for obesity treatment whether in secondary or primary care remain poor (7).

There are several possible explanations for such poor outcomes in the management of obesity including the efficacy of the interventions used, the time available during a consultation and the commitment of the patients being offered help (7). In addition, General Practitioners (GPs) have been criticised for their part in the failure to manage

obesity and the primary care approach to obesity, particularly in the UK, has been described as uncoordinated and inconsistent (8). Further, some medical experts in the clinical field of obesity and professional bodies in medicine are concerned that health professionals, including GPs, are not taking the issue of obesity as seriously as they should (9). There is also evidence that GPs are negative about their own role in obesity treatment which in part reflects the problematic nature of obesity management. For example, one study of Israeli GPs by Fogelman and colleagues (10) found that although GPs believed it was part of their role to advise obese patients on the health risks of obesity, the majority of doctors thought they had not made any difference in getting their patients to make long-term changes in lifestyle. Similarly, a Glasgow based study by Mercer and Tessier (11) reported that doctors generally had 'little enthusiasm for weight management'. Further, the results from a qualitative study of GP's beliefs about treating obesity suggested that although GPs believe that patients want them to take responsibility for their weight problems, they also believe that it is not within their professional domain (12). Previous research has also explored GPs' attitudes to individual treatment approaches and have concluded that GPs have reservations about using anti-obesity drugs (11,12) and surveys show that only 3% of GPs would refer obese patients for behaviour therapy (13) and that only 23% of primary care physicians would refer morbidly obese patients, who met the criteria for surgery, to a surgeon specialising in surgery for obesity (14).

But where do these negative beliefs about treating obesity come from? Research exploring the ways in which people make sense of illness suggests that both lay people and health professionals develop models about illnesses which centre around core illness representations (eg. 15,16). Central to these representations are beliefs

about treatment effectiveness. GPs' beliefs about the effectiveness of different solutions to obesity are consistent with these representations. People, however, also hold beliefs about the causes of the illness and recent research suggests that people's beliefs about causes and solutions are often consistent with each other. This has been termed coherence (15). For example, Ogden and Jubb (17) experimentally manipulated beliefs about causes to a range of health problems and showed that whilst biomedical causes about a problem tended to result in an endorsement of more biomedical solutions, a belief in behavioural causes was associated with beliefs in a more behavioural solution. Similarly, Ogden and Sidhu (18) suggested that when obesity medication works, it does so by creating coherence between the individual's beliefs about the causes of their weight problem and their beliefs about the solution. In addition research illustrates that such consistency relates to adherence to medication and behaviour change (19,20). In terms of GPs it is possible that their negative beliefs about the treatment of obesity relate to their beliefs about the factors that cause it; they are averse to the biomedical management of obesity through surgery and / or medication because they believe that obesity is caused by non biomedical factors. In line with this the present study aimed to explore the association between beliefs about the causes and solutions to obesity.

The failure of the management of obesity may therefore be due to the ineffectiveness of the interventions available, lack of commitment by the patients or by the beliefs and management practices of GPs. However, such an analysis focuses on the unidimensional nature of interventions which is very much in line with a hospital medicine perspective. Primary care research has also tended to focus on the multidimensional nature of the primary care intervention involving the

communication between doctor and patient. Central to this is the importance of agreement and the need for shared understanding and shared models. For example, Pendleton et al (21) argued that the central tasks of a consultation involved agreement with the patient about the nature of the problem, the action to be taken and subsequent management. Tuckett et al (22) likewise argued that the consultation should be conceptualised as a 'meeting between experts' and emphasised the importance of the patients' and doctors' potentially different views of the problem. Some research has explored the degree of agreement between doctors and patients in terms of beliefs about depression, the expression of uncertainty, beliefs about patient centredness and the meaning of health (23-26). Furthermore, Ogden et al (27) reported differences between doctors' and patients' beliefs about obesity and suggested that these differences may contribute to the poor rates of success of obesity management. This study however, did not explore the range of available treatments nor did it explore differences in beliefs about causes and solutions.

Research therefore indicates that the management of obesity remains fairly ineffective. Some research suggests that this may relate to GPs attitudes to obesity treatments although studies to date have explored attitudes to individual treatments for obesity rather than across the board. Furthermore, given the constantly changing availability of new approaches it is possible that attitudes have changed over recent years. In line with this, the present study aimed to explore GP's beliefs about a number of contemporary solutions to obesity. Research exploring illness cognitions also indicates that such negative beliefs about solutions to obesity may reflect beliefs about causes. Therefore the present study aimed to assess the relationship between beliefs about solutions and beliefs about causes. Finally, given the current emphasis

on shared models and agreement within the primary care consultation this study also aimed to assess the extent to which GPs and patients shared common beliefs about causes and solutions. The previous paper by Ogden et al (27) addressed some of these issues. The present study aims to build and develop this work with an additional focus on a breadth of solutions and an assessment the extent to which beliefs about the solutions relate to beliefs about causality.

2. Method

2.1. Design

The study used a cross sectional design with questionnaires concerning the possible causes and solutions of obesity being completed by GPs and members of the general public.

2.2. Sample

Postal questionnaires were distributed to all GPs (n=312) within one Primary Care Trust in the South of England. Responses were received from 73 (response rate = 43%). Questionnaires were also distributed to 724 members of the General Public through a range of outlets such as a health club, shopping mall and university from the same geographical location as the GPs. No incentives were offered. Completed questionnaires were received from 311 participants (response rate=43%). The study was approved by the University Ethics committee. The NHS ethics committee deemed that further ethical approval was not required.

2.3. Measures

All participants were asked to complete a questionnaire consisting of the following sections:

2.3.1. Demographics

Participants were asked to describe their age, sex, weight and height (to compute Body Mass Index (BMI)), their current occupation, highest educational achievement (no GCSE or equivalent, GCSE/ equivalent, A Level/ equivalent, Degree or Masters/ PHD).

2.3.2. Beliefs about causes of obesity

Participants were asked to rate 15 statements regarding the possible causes of obesity on a scale ranging from strongly disagree (1) to strongly agree (5). These items were selected as they varied in terms of personal responsibility and reflected the qualitative and quantitative literature which describes the dimensions of beliefs about causality (12,15,27). The reliability of the items was assessed using Cronbach's alpha:

Biological ('Genetics'; 'Hormones'; 'Slow Metabolism'; $\alpha=0.6$); Psychological ('Low self-esteem'; 'Depressive tendencies within the individual'; 'Lack of control'; $\alpha=0.5$); Behavioural ('Individuals eating too much'; 'Not doing enough exercise'; 'Eating too many unhealthy foods'; $\alpha=0.8$); Social ('Low income'; 'Unemployment'; 'Lack of education'; $\alpha=0.8$); Structural ('Fast food culture'; 'High price of good healthy food'; 'Driving culture'; $\alpha=0.7$);

The individual items were summated to create mean scores for each of these five forms of causal belief.

2.3.3. Beliefs about solutions to obesity

Participants were also asked to rate 3 items relating to the positive aspects of 6 different ways of managing / treating obesity ('useful', 'effective', 'valid use of resources'). These solutions were selected to reflect those currently available and to indicate variation in terms of the extent to which the obese person is perceived responsible for the solution to their problem. These were rated on a 5 point Likert scales ranging from strongly disagree (1) to strongly agree (5). The reliability of these items for each form of solution was assessed using Cronbach's alpha. The solutions chosen were: medication (alpha=0.8), surgery (alpha=0.7), counselling (alpha=0.8), policy change (alpha=0.8), consulting a general practitioner (alpha=0.6) and attending social support group such as Weight Watchers (alpha=0.7). Each set of individual items were summated to create a mean score for each of the six forms of solutions.

Higher scores for these rating scales indicated greater endorsement for the beliefs about the causes of obesity and greater endorsement of both the positive aspects of the solutions for obesity. The 5 point Likert scale responses were collapsed into 3 point responses for descriptive purposes.

3. Results

The results were analysed to describe the participants' demographic characteristics, to describe GP and lay beliefs about causes and solutions to obesity, to explore differences between GPs' and lay beliefs about the causes and solutions to obesity and to assess the role of beliefs about causes in predicting beliefs about solutions.

3.1. Demographic characteristics.

GPs' and lay participants' demographics are shown in table 1.

-insert table 1 about here –

The results showed that the lay participants consisted of slightly more women than men, their average BMI was within the normal weight range, that the majority were white and were educated to up to A level standard and that they showed a broad range of occupations. Their mean age was 37 years. The GPs consisted of slightly more men than women, showed a BMI within the normal range and were predominantly white.

3.2.GPs' beliefs about the causes and solutions to obesity

GPs' beliefs about the causes and solutions to obesity are shown in table 2.

-insert table 2 about here-

In terms of causes the results showed that nearly all GPs endorsed behavioural causes for obesity and a large majority endorsed a psychological cause. About one half believed that structural and social factors were to blame whereas only a minority believed that obesity was caused by biological factors. In terms of beliefs about solutions, the results indicated ambivalence about the different solutions with the majority of GPs stating that they were not sure about the benefits of medication, surgery, counselling, policy changes or seeing a GP. The only exception to this pattern was for support groups which the majority of GPs endorsed as being positive.

3.3. Lay beliefs about the causes and solutions to obesity.

Lay beliefs about the causes and solutions to obesity are shown in table 3.

-insert table 3 about here –

In terms of beliefs about causes the results show that the majority of lay participants believed that obesity was the product of behaviour and just under a half also endorsed biological, structural and personal factors as causes. In terms of solutions the results showed that the sample tended to be unsure about the benefits of medication, policy change and seeing the GP whereas almost the majority believed that counselling, surgery and support groups were positive.

3.4. Differences between GPs and lay beliefs about the causes and solutions of obesity
Differences for the beliefs about causes and solutions between GP and the lay sample are shown in figures 1 and 2

-insert figures 1 and 2 about here -

The results showed that the GPs reported greater endorsement of behavioural ($t=-9.9$, $p=0.0001$), structural ($t=-4.57$, $p=0.0001$), social ($t=-5.26$, $p=0.0001$) and psychological factors ($t=-4.79$, $p=0.0001$) as causes of obesity, whereas the lay sample reported greater endorsement of biological causes ($t=4.37$, $p=0.0001$). In terms of beliefs about solutions the results showed no difference between GPs and lay participants in terms of beliefs about medication, surgery, counselling or policy change (all $ps>0.05$). However, GPs were more positive about the benefits of visiting the GP ($t=-2.24$, $p=0.03$) and attending a support group ($t=-8.96$, $p=0.0001$).

3.5. Predicting beliefs about solutions: the role of causal beliefs

The results were finally analysed to explore the role of causal beliefs (biological, psychological, behavioural, social, structural) in predicting beliefs about solutions (medication, surgery, counselling, policy change, consulting a general practitioner, attending social support group such as weight watchers) using linear Multiple

Regression analysis. Data were analysed for GPs and lay participants separately. It is recommended that there be approximately 10-15 participants for each independent variable entered into a Multiple Regression analysis. The GP (n=73) and lay (n=311) are therefore sufficient to support 5 independent variables.

3.6.1. Predicting GPs' beliefs about solutions

Medication as a solution: The results showed the partial regression coefficients were statistically significant for a belief in a biological cause ($B [df=67]=0.28; p<0.05$) and a social cause ($B[df=67]=0.24; p<0.05$) which accounted for 11.7% of the variance in a positive belief about the effectiveness of medication.

Visiting the GP: The results showed that none of the beliefs about causes significantly predicted a belief that visiting the GP would be effective.

Having surgery: The results showed that none of the beliefs about causes significantly predicted a belief that surgery would be effective.

Having counselling: The results showed that none of the beliefs about causes significantly predicted a belief that counselling would be effective.

Policy change: The results showed that the partial regression coefficients were statistically significant for a belief that obesity was caused by structural factors ($B[df=67]=0.3; p<0.05$) only. This accounted for 3% of the variance of the belief that policy change would be an effective solution.

Attending a support group: The results showed that the partial regression coefficients were significant for the belief that obesity was caused by the person's own behaviour ($B[df=67]=0.3$; $p<0.05$) only. This accounted for 3% of the variance in the belief that attending a support group would be effective.

3.62. Predicting lay participants' beliefs about solutions

Medication as a solution: The partial regression coefficients were significant for a stronger endorsement of biological causes ($B[df=301]=0.21$; $p<0.0001$), psychological causes ($B[df=301]=0.2$; $p<0.005$) and social causes ($B[df=301]=0.3$; $p<0.0001$) and a lower belief in behavioural causes ($B[df=301]=-0.33$; $p<0.0001$). These accounted for 26.5% of the variance in a more positive belief about the use of medication as a solution.

Visiting the GP: The partial regression coefficients were significant for a greater endorsement of psychological causes ($B[df=301]=0.19$; $p<0.01$). This accounted for 3% of the variance in a more positive belief about visiting the GP as a solution.

Having surgery: The partial regression coefficients were significant for a higher belief in structural causes ($B[df=301]=0.25$; $p<0.0001$) and a lower belief in social causes ($B[df=301]=-0.3$; $p<0.0001$). This significantly predicted a belief in surgery as a solution accounting for 10.9% of the variance.

Having counselling: The partial regression coefficients were significant for a greater belief in biological causes ($B[df=301]=0.18$; $p<0.005$), behavioural causes

($B[df=301]=0.23$; $p<0.0001$) and structural causes ($B[df=301]=0.14$; $p<0.05$). This significantly predicted a belief in counselling accounting for 19.1% of the variance.

Policy change: The partial regression coefficients were significant for a greater belief in biological causes ($B[df=301]=0.18$; $p<0.005$) and behavioural causes ($B[df=301]=0.35$; $p<0.0001$) and a lower belief in psychological causes ($B[df=301]=-0.26$; $p<0.01$) and social causes ($B[df=301]=-0.16$; $p<0.01$). This accounted for 11.2% of the variance of an endorsement of policy change as a solution for obesity.

Attending a support group: The partial regression coefficients were significant for a greater endorsement of psychological causes ($B[df=301]=0.23$; $p<0.005$) and a lower endorsement of social causes ($B[df=301]=-0.26$; $p<0.05$). This accounted for 5% of the variance in a positive belief about attending a support group as a solution to obesity.

4. Discussion and conclusion

4.1. Discussion

Research indicates that although the management of obesity often occurs within the primary care setting the effectiveness of primary care based interventions remains poor. There are a number of possible explanations for this relating to the efficacy of the treatment approach and the commitment of the patients (7). In addition, such poor outcomes may also relate to aspects of the interaction between GP and patient including GPs' beliefs about obesity and the mismatch between their beliefs and those of the general public. In line with this, the present study aimed to explore GP and lay people's beliefs about the causes and solutions to obesity. The results showed that in

general the GPs were ambivalent about the majority of solutions for obesity including medication, surgery, counselling, policy changes and seeing the GP. This supports previous research which indicates that doctors have little faith in the management approaches available for obesity and are often reluctant to refer patients for further treatment (11,12,14). The majority of GPs however, did endorse the use of support groups which is in line with previous evidence indicating that GPs do not believe that obesity falls within their professional domain (12). In terms of causes, the results indicate that the majority of GPs endorsed behavioural and psychological causes, whereas some regarded structural or social factors as important and only a minority considered obesity to be a biological problem. This supports previous research indicating that GPs conceptualise obesity as the patient's responsibility (12,27). It also suggests that they also locate the problem within the broader social context which may reflect the recent emphasis on the obesogenic environment (3). Research indicates that the management of obesity is often unsuccessful. In part this may reflect GP's beliefs about the effectiveness of available solutions and their beliefs about the causes behind obesity.

It has also been suggested that the failure of primary care based interventions may also reflect a mismatch between the beliefs of GPs and those of the lay population. The present study provides evidence for this mismatch and illustrates that GPs show a greater endorsement of behavioural, structural, social and psychological factors as causes of obesity whereas the lay population in this study showed greater endorsement of biological causes. In addition, GPs also showed a more positive belief about the role of the GP and a support group in managing obesity. Previous illustrates indicates that GPs and patients hold different beliefs concerning a number

of health related issues including depression, the meaning of health, patient centredness and the expression of uncertainty (23-26). The present study illustrates that they also hold different beliefs about the causes and solutions to obesity. This supports previous research (27) but further illustrates rather than these views differing about the effectiveness of solutions per se they differ according to each different solution. In particular, whilst GPs hold a more behavioural model of obesity, the general public seem to endorse a more biological approach.

GPs therefore report a lack of faith in most available solutions for obesity and report a more behavioural model of obesity compared to the general public who endorse a more biological approach. The present study finally aimed to explore where beliefs about solutions come from and to assess the relationship between beliefs about solutions and beliefs about causality. For GPs, although beliefs about cause were unrelated to beliefs about visiting a GP, having surgery or counselling associations were found for other available solutions. In particular, for beliefs about the effectiveness of medication, policy change and attending a support group, beliefs were consistent with appropriate beliefs about causality. For example, a belief in a biological cause predicted a positive belief in medication, a belief in a structural cause predicted a belief in policy change and a belief in a behavioural cause predicted an endorsement of support groups. Research exploring both professional and lay beliefs about illness illustrates that people hold beliefs about both the causes and solutions to illness and that these are often consistent with each other. For example, Ogden and Jubb (17) experimentally manipulated beliefs about causes and reported consistent shifts in beliefs about solutions. Furthermore, research indicates that such coherence between beliefs relates to a number of outcomes including adherence to medication

and behaviour change (18-20). The results from the present study support this literature and illustrate coherence within GPs' beliefs about obesity and consistency between their beliefs about causes and solutions. Accordingly, GPs' beliefs about the effectiveness of a number of available solutions reflect beliefs about the factors behind obesity in the first place. In line with this solutions are deemed appropriate and effective if they are also deemed to address the cause of the problem.

For lay people, however, a much less consistent pattern was found. For example, although a belief in a biological cause was related to an endorsement of medication and a belief in psychological causes was related to an endorsement of support groups other associations reflected much less coherence. In particular, an endorsement of counselling and policy change was related to a belief in biological causes and an endorsement of surgery was related to a lower belief in social causes. Perhaps this reflects a difference in the ways in which health professionals and the public develop beliefs about effectiveness. It is possible that GPs develop beliefs about effectiveness by mapping beliefs about solutions onto beliefs about causes. In contrast, a non medical sample may prefer to draw upon types of evidence other than their beliefs about causality including their own and others' experience and the information they have gathered from a multitude of sources. For GPs it would seem that a solution is deemed likely to be effective if it addresses the cause of the problem. Perhaps for the general public, the need to address causality is less important.

4.2. Conclusion

To conclude, the present study indicates that GPs are ambivalent about the effectiveness of the majority of available solutions for obesity and only show an

endorsement for support groups. When compared to a lay population, GPs show a greater endorsement of behavioural, structural, social and psychological causes of obesity whereas the lay population prefer a more biological model of causality. This supports previous research and indicates that whereas the public believe that obesity may have a medical cause, GPs believe that obesity does not belong within the medical domain. The present study also provides some evidence for the origins of such beliefs about solutions to obesity and reports that although at times the association between beliefs about causes and solutions is relatively small there is a consistency between GPs' beliefs about solutions and causes.

4.3. Practice implications

Much research indicates that the effectiveness of primary care based management of obesity remains poor. In part this may reflect the beliefs of the GPs and the mismatch between these beliefs and those of the general public. It may also reflect GPs' lack of faith in available solutions and a need for consistency between their beliefs about causes and solutions. In particular, GPs appear to have beliefs about the efficacy of a given solution if the solution maps onto their beliefs about what has caused obesity in the first place. Such coherence between beliefs about causes and solutions has been shown to relate to positive outcomes such as adherence to medication and behaviour change. Coherence, however, may not always be of benefit as it underestimates the potential contribution of solutions which do not directly address the cause. For example behavioural problems may be solved by medical solutions or those involving change in policy and medical problems may benefit from behavioural approaches. A need for coherence may therefore limit a GP's perspective on what constitutes a suitable solution. If GPs are to be encouraged to take responsibility for obesity

management and to improve the effectiveness of their management approaches then they either need to change their beliefs or to consider whether solutions need always address causality. This may involve the GPs who endorse a more medical model of causality accepting that behavioural solutions can be useful, or those who believe obesity is caused by the patient's behaviour considering offering a more medical approach to management.

References

1. Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A., Tabak, C.J., & Flegal, K.M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. Journal of the American Medical Association, 295, 1549-55.
2. Chinn, S. & Rona, R.J. Prevalence and trends in overweight and obesity in three cross sectional studies of British children, 1974-94. British Medical Journal, 2001; 322, 24-26.
3. Hill, JO & Peters, JC. Environmental contributions to the obesity epidemic, Science, 1998; 280: 1371-4.
4. Ashton, W, Nanchahal K, & Wood, D. Body mass index and metabolic risk factors for coronary heart disease in women. European Heart Journal. 2001; 22, 46-55.
5. Wadden, T,A., Butryn, M,L., Sarwer, D,B., Fabricatore, A,N., Crerand, C,E., Lipschutz, P,E., Faulconbridge, L., Raper, S,E., & Williams, N,N. (2006). Comparison of psychosocial status in treatment seeking women with class 111 vs class 1-11 obesity. Obesity. 14, suppl 2: 90S-98S.
6. Wadden, T.A. Treatment of obesity by moderate and severe calorie restriction: Results of clinical research trials. Annals of Internal Medicine, 1993; 119, 688-693.
7. NHS Centre for Reviews and Dissemination. Systematic Review of Interventions in the Treatment and Prevention of Obesity. York: University of York. 1997.
8. Kopelman, P.G. and Grace, C. New thoughts on managing obesity. Gut, 2004; **53**, 1044-53.
9. Moore, H., Summerbell, C.D., Greenwood, D.C., Tovey, P., Griffiths, J., Henderson, M., Hesketh, K., Woolgar, S. & Adamson, A. Improving management of obesity in primary care: cluster randomised trial. British Medical Journal, 2003; **327**, 1085-8.

10. Fogelman Y, Vinker S., Lachter J., Biderman A., Itzhak B., & Kital E. Managing obesity: a survey of attitudes and practices among Israeli primary care physicians. International Journal for the Study of Obesity. 2002; **26**, 1393-7.
11. Mercer SW, & Tessier S. A qualitative study of general practitioners' and practice nurses' attitudes to obesity management in primary care. Health Bulletin. 2001; 59(4): 248-53.
12. Epstein, L., & Ogden, J. A qualitative study of General Practitioners' views of treating obesity. British Journal of General Practice, 2005; **55**, 750-754.
13. Cade, J. & O'Connell, S. Management of weight problems and obesity: knowledge, attitudes and current practice of general practitioners. British Journal of General Practice, 1991; **41**, 147-150.
14. Foster, G.D., Wadden, T.A., Makris, A.P., Davidson, D., Swain Sanderson, R., Allison, D.B. & Kessler, A. Primary care physicians' attitudes about obesity and its treatment. Obesity Research, 2003; **11**, 1168-1177.
15. Leventhal, H., Benyamini, Y., & Brownlee, S. Illness representations: theoretical foundations, in K.J. Petrie & J.A. Weinman (eds), Perceptions of Health and Illness, pp. 1–18. Amsterdam: Harwood. 1997.
16. Weinman, J., Petrie, K.J., Moss-Morris, R. & Horne, R. (1996) The illness perception questionnaire: a new method for assessing the cognitive representation of illness, Psychology and Health, 11: 431–46.
17. Ogden, J., & Jubb, A. (in press). How consistent are beliefs about cause and solutions to illness: an experimental study. Psychology Health and Medicine
18. Ogden, J., & Sidhu, S. (2006). Adherence, behaviour change and visualisation: a qualitative study of patient's experiences of obesity medication. The Journal of Psychosomatic Research. 61, 545-552.

19. Horne, R & Weinman, J. Self regulation and self management in Asthma: exploring the role of illness perceptions and treatment beliefs in explaining non adherence to preventer medication. Psychology and Health, 2002; 17, 17-32.
20. Llewellyn, C.D., Miners, A.H., Lee, C.A., Harrington, C. & Weinman, J. The illness perceptions and treatment beliefs of individuals with severe haemophilia and their role in adherence to home treatment, Psychology and Health, 2003; 18, 185–200.
21. Pendleton, D., Schofield, T., Tate, P., Havelock, P. The consultation: an approach to learning and teaching. Oxford Medical Publications: Oxford. 1984.
22. Tuckett, D., Boulton, M., Olson, C. & Williams, A. (1985) Meetings Between Experts. London: Tavistock Publications.
23. Ogden, J et al. (1999). You're depressed, no I'm not: GPs' and patients' different models of depression. British Journal of General Practice. 49, 123-124.
24. Ogden, J. et al. (2002). Doctors' expressions of uncertainty and patient confidence. Patient Education and Counselling, 48, 171-176.
25. Ogden, J., Ambrose, L., Khadra, A., Manthri, S., Symons, L., Vass, A., & Williams, M. (2002) GPs' and patients' views of aspects of patient centredness. Patient Education and Counselling, 47, 223-227.
26. Ogden, J., Baig, S., Earnshaw, G., Elkington, H., Henderson, E., Lindsay, J., & Nandy, S. What is health?: and where GPs and patients worlds collide. (2001). Patient Education and Counselling. 45, 265-269.
27. Ogden, J., Bandara, I., Cohen, H., Farmer, D., Hardie, J., Minas, H., Moore, J., Qureshi, S., Walter, F., & Whitehead, M. GPs' and patients' models of obesity: whose problem is it anyway? Patient Education and Counselling. 2001; 40, 227-233.

Fig 1: GP's and lay beliefs about the causes of obesity

Fig 2: GP's and lay beliefs about the solutions to obesity

Table 1: Lay and GPs' demographics.

Variable	Lay (n=311)	GP (n=73)
Age	Mean=37.4 SD = 13.9 Range = 16 – 78	Mean=47.7 SD = 9.1 Range = 29 – 65
Sex	Male = 138 (45%) Female = 169 (55 %)	Male = 41 (56.2%) Female = 32 (43.8%)
BMI	Range = 15.3 – 42.0 Mean=24.7 SD=4.6	Range = 18.2 – 37.8 Mean=24.8 SD=3.4
Ethnicity	White = 201 (65.5%) Asian=60 (19.5%) Black = 35 (11.4%) Other = 11 (3.6%)	White = 51 (66.9%) Asian=16 (21.9%) Black = 4 (5.5%) Other = 2 (2.7%)
Education	No GCSE = 19 (6.2%) GCSE = 73 (23.8%) A Level = 127 (41.4%) Degree = 66 (21.5%) Masters/ PHD = 22 (7.2%)	No GCSE = 0 GCSE = 0 A Level = 0 Degree = 49 (67.1%) Masters/ PHD = 24 (32.9%)
Occupation	Professional = 23 (7.5%) Intermediate = 36 (11.7%) Skilled non-manual = 74 (24.1%) Skilled manual = 58 (18.9%) Semi skilled = 21 (6.8%) Unskilled = 27 (8.8%) Student = 54 (17.6%) Retired = 13 (4.2%) Unknow1 (0.3%)	Professional (GP) = 73 -100%

Table 2: GPs' beliefs about the causes and solutions for obesity

Variable	No	Not Sure	Yes
Causes			
Biological	21 (28.8 %)	31 (42.5 %)	21 (28.8%)
Behavioural	0 (0 %)	2 (2.7 %)	71 (97.3 %)
Structural	3 (4.1 %)	27 (37 %)	43 (58.9 %)
Psychological	1 (1.4 %)	20 (27.4 %)	52 (71.2 %)
Social	4 (6.1 %)	36 (49.3 %)	33 (45.2 %)
Solutions			
Medication	18 (24.7 %)	27 (37.0 %)	28 (38.4 %)
Surgery	9 (12.3 %)	35 (47.9 %)	29 (39.7%)
Counselling	11 (15.1 %)	34 (46.6 %)	28 (38.4 %)
Policy	24 (32.9 %)	24 (32.9 %)	25 (34.2 %)
GP	11 (15.1 %)	34 (46.6 %)	28 (38.4 %)
Support group	1 (1.4 %)	5 (6.8 %)	67 (91.8 %)

Table 3: Lay beliefs about causes and solutions for obesity

Variable	No	Not Sure	Yes
Causes			
Biological cause	31 (10.1 %)	134 (43.6 %)	142 (46.3 %)
Behavioural cause	16 (5.2 %)	48 (15.6 %)	243 (79.2 %)
Structural Cause	56 (18.2 %)	115 (37.5 %)	136 (44.3 %)
Personal Cause	14 (4.6 %)	148 (48.2 %)	145 (47.2 %)
Social cause	100 (32.6 %)	108 (35.2 %)	99 (32.2 %)
Solutions			
Medication	94 (30.6 %)	113 (36.8 %)	106 (32.6 %)
Surgery	46 (15.0 %)	114 (37.1 %)	147 (47.9 %)
Counselling	73 (23.8 %)	85 (27.7 %)	149 (48.5 %)
Policy	82 (26.7 %)	115 (37.5 %)	110 (35.8%)
GP	94 (30.6 %)	88 (28.7 %)	125 (40.7 %)
Support group	20 (6.5 %)	110 (35.8 %)	177 (57.7 %)