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RESEARCH

General practitioners roles and experiences with functional foods containing probiotics and plant sterols

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Aim: The purpose of this research is to explore whether general practitioners have experiences with functional foods within their clinical practice. **Background:** Previous research and editorials have suggested that general practitioners should have more involvement and knowledge of functional foods. This is due to the thought that functional foods may be consumed by their patients that could lead to other issues, such as patients not taking their medication. Therefore, research into general practitioners involvement with functional foods needs to be conducted. **Method:** In all, 10 semi-structured open interviews were used with a topic guide. These interviews where digitally audio recorded and transcribed verbatim. The transcripts where analysed using thematic analysis. **Findings:** It was found that general practitioners believed they did not have a direct role with functional foods and should not be involved with discussing them with their patients. They felt that if they where to be involved with functional foods then they would need more training and information about them. They also felt that functional foods could be empowering for their patients.

Key words: cholesterol; functional foods; general practitioners; irritable bowel syndrome; plant sterols; probiotics

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General practitioners (GPs) are often the primary form of contact for people with a health concern who are seeking health advice. However, whether functional foods (FFs) are discussed as part of health advice to patients is unknown. Therefore, this study aims to explore the idea that FFs are being discussed within practice and whether GPs perceive themselves as having a role with FF, and what role that is. Using 10 academic GPs from the University of Manchester, semi-structured interviews were conducted and then analysed thematically.

'Functional foods are foods that have a potentially positive effect on health beyond basic nutrition' (Nelson, 2012: 1). This study focuses on probiotics and plant sterols. Plant sterols are food additives derived from plants that are believed to provide cholesterol-lowering qualities, which are commonly added to margarines. Research reviews have found that plant sterols will reduce low-density lipoprotein cholesterol (Abumweis *et al*., 2008; Amir Shaghaghi *et al.*, 2013) but other evidence suggests that plant sterols produces no difference on high-density lipoprotein cholesterol levels (Derdemezis *et al.*, 2010). In addition, another review study reported that no conclusions could be made about a cholesterol-lowering diet on hypercholesterolaemia owing to the lack of adequate data (Shafiq *et al.*, 2010).

Probiotics are a type of bacteria added to foods that are believed to be good for the stomach and digestive system and provides regularity of the bowels. Previous research into probiotics as FFs found that they may provide health benefits (Sarkar, 2013). One systematic review resulted in

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the author's moderate confidence in probiotics being safe and effective for preventing antibiotic associated diarrhoea (Goldenberg *et al.*, 2013). However, another review found that some case studies suggested that probiotic use produced infection (Whelen and Myers, 2010). Therefore, evidence for FF is unclear.

Research with Finnish consumers has found that if a medical professional had recommended a FF then they would be more likely to believe in their claims (Niva and Mäkelä, 2007). Therefore, the recommendation of FF by health professionals could have an impact on patient's consumption behaviour. Other health professionals believe that those who eat FF may alter their medication without consulting a doctor (de Jong *et al.*, 2007; Basulto *et al.*, 2012), which could lead to the patient's ailments not being managed effectively. Another suggestion has been made that a lower dose of statin can be more than compensated for by the addition of plant sterols to lower the consumer's cholesterol (Thompson, 2007). This could have implications for the prescribing and advice provided by GPs. Other professionals also think that FFs are in common usage by patients who do not know when they should be consumed (Wallace, 2007; Basulto *et al.*, 2012). However, research by Weiner (2010), which examines how health professionals view perceived users of FFs in the literature, has found that relatively little is known about the rationales and practices of actual users. De Jong *et al.* (2007) have gone on to suggest that doctors and health professionals should be informed about the results of FFs in order to inform and educate their patients.

It has been suggested that patients favour health education in consultation with their GP and that patients accept that their GP may talk to them about diet (Truswell *et al.*, 2003). However, GPs viewed this as being part of a practice nurse's responsibility as a lack of time and excessive workload allows for limited health promotion and prevention (Williams and Calnan, 1994; Calderón *et al.*, 2011). Furthermore, GPs were concerned that the 'worried well' patients were using the preventative services rather than those who were at highest risk. GPs may be reluctant to discuss health behaviours and dietary roles with their patients as it may not be them who are at most risk of needing a health change (Williams and Calnan, 1994). This could have an impact on the discussion of FFs within consultations with GPs. In addition, as the sales of FFs is increasing globally (Granato *et al.*, 2010) with a probiotic-based yoghurt drink selling at 219 000 bottles a day in the United Kingdom (Yakult Annual Report, 2013), it is apparent that FFs are being consumed in large quantities and may be a rising concern for GPs and their patients.

One study, which was conducted in Sweden, examined health professionals (dietitians, registered nurses and physicians) willingness and trust in recommending FFs (Landström *et al.*, 2007). Neither the nurses nor the physicians believed that FFs had any additional benefits over other healthy foods, suggesting that other dietary adjustments would be needed (eg, reduce fat intake). They did not feel confident in recommending FFs but dietary advice did seem to be part of their practice. However, these physicians and nurses did not describe whether they had previous experience with FFs (Landström *et al.*, 2007).

Overall, it is clear that there are concerns about FFs being consumed by patients and that there is a relatively small amount of research about clinical practice in relation to these foods. Commentary by health professionals has suggested that GPs should be involved in discussing FFs with patients. However, little is known about the thoughts of GPs in the United Kingdom and whether patients discuss FFs in practice. Although suggestions have been made, this research will highlight GP's current practice experiences, their professional views and their role concerning FFs.

Method

A sample of 10 academic GPs were recruited from the University of Manchester. The sample was chosen by emailing all the academic GPs within the University who were on the online database. The 10 participants were the individuals who responded with interest in the study. Therefore, the sample was opportunistic with an age range from 28 to 56 years old with equal males to females. These GPs worked in a variety of practices throughout the Manchester area and had a range of practice experience, from trainees to 25 years. All interviews took place between March and July 2011. The interviews were all recorded

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on a digital audio recording device and lasted between 20 and 60 min. A topic guide, prepared before the study and based on the research questions, was used to assist the researcher during the interviews. The opening question on the topic guide was 'What do you understand by the term "functional food"?'. Depending on the flow of the interview, further questions/probes could be made (eg, 'Please can you give some examples?', 'What effects are they reported to have?').

During some of the interviews some packaging of FFs was shown to the participants for them to browse, which aided the discussion. When the packaging was introduced varied with each participant as it was unclear when the most appropriate time would be. Some saw this at the beginning (GPs one to four), some saw no packaging (GPs five and seven) and some saw the packaging during the interview, after they had described what they thought a FF was (GPs 6 and 8–10). The audio recordings were then transcribed verbatim. These transcripts were then analysed by the author, using thematic analysis as described by Braun and Clarke (2006). A theme was captured if it was prevalent. However, data were still noted if it was unexpected or unusual (Weiner, 2009). This method was conducted to produce themes because it allows for flexibility and a wide array of themes to be explored. An inductive approach has been used to identify the themes. This method was chosen because the themes emerged from the data without trying to fit the data into any preconceptions. However, some deductive methods were used owing to the specific research questions that were being explored. The stages to discover the themes were first to become familiar with the data. The second stage was to generate initial codes. The third phase was to search for themes and then to review the themes. Then finally define and name the themes. Three themes were identified: (i) knowledge of FFs, (ii) users of FFs and (iii) practice issues.

Results

Knowledge of FFs

GPs were sceptical of the research about FFs and claims that the products made. In order for the claims, which were described as 'overstated', to be believed then more research would need to be conducted. One GP described his knowledge of how FFs could be used and misused:

> A lot of this work on [cholesterol lowering functional food] is on controlled groups, whereas really what we need to do now is … do it in their settings of their homes because they might drink a pot of [cholesterol lowering functional food] and then go and have, you know, a bacon sarnie, which just destroys the impact of it
>
> (GP 4).

The GPs also had different experiences that were because of the type of practice in which they have been working.

> What I know most about is, because I used to do an IBS clinic as a house officer, was probiotics and as I've said I've been to a few [functional foods brand] sponsored events
>
> (GP 9).

This GP was more inclined towards the effectiveness of probiotics owing to his experience of working in an irritable bowel syndrome clinic, something for which probiotics was thought to be effective. These GPs felt more comfortable with certain FFs if they had more experience of their effects or with patients that may use them. This may influence the way they talk about them to patients within their consultations.

With regard to the discussion around probiotics, there was a mixed opinion as to their efficacy, this was expressed in relation to the view that other foods can be as effective and because the effects of FF are not easily measurable. Some GPs considered the cholesterol-lowering foods as having more evidence because a measurable difference may be seen.

> GP – I will probably be more persuaded by [cholesterol lowering functional food]…
>
> Interviewer – So how come you will be more persuaded by the [cholesterol lowering functional food]?
>
> GP – Perhaps because it might be easier to see an effect, a measurable effect, somebody's lipids
>
> (GP 3).

From these perspectives even though the GPs were able to give an opinion about the lack of evidence for FFs, seven of them stated that they did not know much about the evidence 'But I've not read the evidence for it so well, not directly' (GP 3). They could be producing an opinion purely because they have been asked for one within the interview process, rather than based on pre-existing knowledge. However, they also felt that they needed to know more about the research on effectiveness of FFs.

Although the GPs mainly viewed the evidence of FFs quite negatively, they did mention how FFs could result in some beneficial factors. One of these was that FF were viewed as a health food and do not cause any harm.

> I know particularly in some European countries they will prescribe a probiotic to replenish the gut bacteria… I don't see any harm in it
>
> (GP 4).

Some of the GPs discussed how FFs would be better than unhealthy foods; however, it was felt that without an overall lifestyle change these benefits would be very limited.

> So if you think that you just take this and it will lower your cholesterol then you're in cuckoo land really. But I think if you take it as part of an overall attempt to be fitter and healthier…
>
> (GP 4).

One of the biggest benefits expressed by GPs was the ability for FFs to bring empowerment for the patient. A patient may feel empowered when taking a FF because they would be taking control over their own health and may not feel the need for health professionals to be telling them what they should do.

> I think it's more empowering than to come to the doctor to get it so I think that it is a good thing because I think it puts it very much in the patients control
>
> (GP 3).

This idea of empowerment was expanded further by some to include an influence of health behaviour change and to explore new foods.

> Well actually if this helps people to feel like they're doing something positive about their health and looking at their diet for example, and beginning to explore using foods or having foods that perhaps they haven't had before and are potentially more healthy than what they have been eating, then there may be benefit in them (GP 6).

Another perceived benefit to FFs, with reference to the probiotics, was that it could cause some possible symptom relief for those who have irritable bowel syndrome. While they recognised that this could be because of a placebo effect, if it gave their patients some relief then this was a definite benefit.

> If it gives them benefit be it placebo, be it real physical effect, and be it real psychological effect. If it helps them then that's okay
>
> (GP 10).

However, some saw FFs as medicalising normal symptoms. This was an issue with some of the GPs because it was felt that the food industry was influencing people into believing that normal stomach reactions are actually a medical problem.

> It's almost like a medicalisation situation. The normal gurgling of your tummy; the normal aches and pains suddenly become an illness
>
> (GP 5).

Contrary to this, another GP discussed that there could be a medical problem that does need a consultation. If a person is choosing to consume a FF instead of seeing their GP then a situation could be missed, for which a different intervention, such as drugs or an overall lifestyle change, could be more beneficial.

> I think it's marketed as patient making the decision to start them on their own, which is fine, but I think we are missing opportunities to consult with their GP to get a more holistic review of what their lifestyle is at the moment
>
> (GP 9).

Users of FFs

There was a wide opinion among the GPs about who they thought FFs were consumed by. A regular occurrence within these interviews was that GPs felt that FFs were mainly aimed at and

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consumed by the wealthy middle class owing to their high cost.

> Most the people where I'm from that buy it are mostly the middle class richer ones
>
> (GP 10).

Another GP believed that these products were aimed at everybody, male, female, old and young.

> I think they are aimed at everyone. A couple of years ago I lived with a flat mate who used to drink [probiotic functional food] and he was a man, my next door neighbour is 70, so an old lady, they do seem to go to everyone
>
> (GP 8).

Another GP saw these FFs as being aimed at the vulnerable. This implies that advertising may be targeting those that are ill and vulnerable who do not know what else to do.

> That's probably those who are vulnerable who don't quite assess all of the information and will just go for the first thing that's available
>
> (GP 9).

This GP had experience with irritable bowel syndrome patients who, as a group, tend to be quite vulnerable with limited medications. The GP could be drawing upon experiences he has witnessed of vulnerable patients wanting to try something else to ease their symptoms.

It was also believed that FFs may be consumed by those who are anxious about their health, but are actually fit and healthy. The term 'worried well' was used by two GPs and described indirectly by four. These GPs expressed how FFs were seen as more of a treatment for the mind and a person's perceived risk of health, rather than for those who had been told they are at risk. However, some of the GPs did recognise that consumers of these products may be people who have a particular illness and perhaps think these will be an added benefit or because they do not like to take formal medication.

Practice issues

Overall it appeared that GPs do offer dietary advice, although somewhat basic. As one GP mentioned, GPs as a group received limited training on dietary advice. Perhaps this is due to prevention of illness through lifestyle and a diet being a fairly new concept within the medical institutions (Williams and Calnan, 1994). However, it could also be because GPs may not see this as being part of their role, rather that of a nurse instead.

> Dietary advice but very, very simplistic, pending on them having more information and advice over a period of time, again usually through practice nurses
>
> (GP 6).

This could also explain why most of these GPs seemed to have a limited knowledge and experience with FFs. In all, nine of the GPs saw their roles as being information givers to the patients and being able to inform them of whether products worked and what lifestyle changes they need to make. A few of the GPs talked of providing patients with leaflets and printing off information from the internet.

Another aspect that nearly all the GPs mentioned occurring within their practice was that the consultation was led by patient query. If patients did not ask about dietary advice or FFs then it was unlikely that they would be brought up at all.

> Recent patients with high cholesterol have wanted to know more about tablets; therefore I have spoken about the tablets and referred them to a dietitian
>
> (GP 8).

Although these GPs mostly discussed how they do not recommend FFs, it was viewed as being their role to give patients all the information about their effectiveness in order for their patients to make the informed choice to consume these products. These GPs went on to discuss how other lifestyle moderations may be of more benefit to the patients or to recommend medication instead.

GPs felt the need to negotiate with their patients rather than to tell them what to do. They believed that most patients want to make a decision for themselves and it is their choice whether to follow the GP's advice or not. One GP discussed the use of trial periods as a form of negotiation. For example, one GP talked about this in relation to a patient wanting to consume cholesterol-lowering

FFs instead of statins and the implications that not taking their statin could have.

> As long as they understand the implications and that it does put them at a greater risk of having a high cholesterol in itself, all the evidence says it puts them at a greater risk of a stroke, but then you know the numbers are quite big and if they're happy to take that risk then that's their choice
>
> (GP 8).

GPs expressed a preference towards giving out medication rather than alternative therapies. This could be due to having limited time to discuss health promotion and expecting nurses or dietitians to discuss alternative therapies instead. It appears that they were more comfortable with something that they could prescribe, which may explain their reluctance to recommend FFs.

> I think I've always had the opinion that you can have a healthy diet and as a doctor probably jump into giving a statin because you are more familiar with it and familiar with prescribing it and having some control over it
>
> (GP 8).

One situation which arose was that it would seem harmful to use FFs as a medication when replacing a statin for those at a high risk of heart disease or high cholesterol. GPs realised that if patients chose to consume cholesterol-lowering FF instead of a statin then they may not be reducing their risk.

> The main concern is that people would see that as an alternative to a more effective intervention
>
> (GP 3).

However, some also expressed that using a FF instead of medication could be a benefit because statins are a long-term medication and they can have some negative side effects. Therefore, if a patient chose to consume FFs instead of a medication it may give them a better quality of life and way of living, but perhaps not reduce their risk as much as medication would.

Another topic that was brought up with FFs being taken alongside a statin was the concern of interactions. This was the main concern that most of the GPs expressed with regard to patients who were on medication and consuming these foods.

> That might mean that there is possibly an interaction with statins and I would have to look that up and again go through that with them
>
> (GP 8).

However, only one GP discussed a concern that patients might think they no longer needed medication and would therefore stop taking it, without consultation.

> As I say it was a factor that may lead to patients to stopping their medication without taking advice, which would be my concern
>
> (GP 6).

Another GP also mentioned that if a patient was on a statin then they would not need to consume a cholesterol-lowering food because the statin would be doing that job, and the food would be adding no extra benefit.

> But you wouldn't need it, if you were taking a statin you wouldn't need it because it would make only the tiniest proportion of difference
>
> (GP 5).

Discussion

With regard to this study, three main themes emerged; (i) knowledge of FFs, (ii) users of FFs and (iii) practice issues.

(i) These GPs demonstrated a lack of knowledge when it came to FFs particularly concerning their effectiveness. Similar to the findings by Landström *et al.* (2007), GPs seemed sceptical of claims of effectiveness. However, unlike previous research these GPs differed among themselves with regard to which types of FFs they were most likely to believe were effective. This difference seemed to stem from the experiences each of the GPs had from their clinical practices.

Similar to the suggestions made by de Jong *et al.* (2007), these GPs did feel as though they needed to know more information about FF in order to advise and inform their patients. These GPs also felt they should not be asking their patients about

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FFs as they did not see it as their role or a common occurrence within consultations.

Overall, the GPs viewed FFs as being healthy foods rather than alternative medicines, but foods that could offer their patients empowerment towards improving their health. However, as GPs feel they have limited knowledge with FFs and limited training within health promotion, then perhaps they need some guidance on the relative effectiveness of different FFs to be able to advise their patients.

(ii) For those patients who did mention FF, GPs saw other lifestyle changes as more important (Hamer *et al*., 2005). One concern that GPs did have was that consumers of FFs may be ignoring the other lifestyle changes that are needed and seeing these foods as a 'quick fix', which will not lower their risk of disease. Research conducted into the perceived users of cholesterol-lowering foods within biomedical journals also found that consumers were sometimes 'configured' as being lazy or busy and as consuming these foods instead of a healthy lifestyle (Weiner, 2010). This is inconsistent with research involving Finnish consumers that discussed healthiness as meaning the whole diet (Niva, 2007). However, this does not confirm whether some consumers who have a health risk, consume FFs instead of an overall healthy lifestyle.

The GPs thought FFs were aimed at the vulnerable and the 'worried well', who were anxious about their health but otherwise healthy. This is similar to the thoughts of Lang (2007) who suggested that FFs were aimed at the 'worried well' and were a burden on poor people's expenses. The presumed 'worried well' consumer is consistent with Williams and Calnan (1994) who report that GPs perceive patients who used preventative services as the 'worried well', rather than those who are at high risk.

(iii) Within the consultations, GPs would negotiate if their patient wanted to consume a FF instead of medication but only if the patient mentioned it. They would discuss the possible effects of not taking medication and offer a trial period for the FF. GPs are aware that some of their patients consume these products because they have a health problem or risk even without consultation, which is consistent with research conducted with consumers (Niva, 2006).

A benefit was that FFs could assist in empowering people and encourage them to make health behaviour changes (Arvanitoyannis *et al*., 2005). This overall lifestyle change was seen as being the most important form of prevention. However, it was felt that GPs have limited training involving diets and they would refer onto a nurse or a specialist if a dietary or lifestyle intervention was needed. GPs did not seem to view health education as their responsibility, which is consistent with Williams and Calnan (1994) who found that GPs felt preventative work, was the role of nurses. This does not confirm the suggestions made by de Jong *et al*. (2007) that GPs should be involved with health education of their patients when it involves FFs. Information about diets was basic, limited and often in the form of leaflets. However, this was only given when needed and on patient request. In relation to cholesterol-lowering foods, some of the GPs preferred to provide patients with medication, such as a statin, rather than talk about dietary changes because this was what they are most familiar with and have most control over.

Contrary to de Jong *et al.* (2007), only one GP had any concerns that a patient may stop taking their medication without consultation. Some had the opinion that as long as patients knew the risks of taking a FF instead of medication (ie, a statin) then they could try it if they wanted because the medication may have some negative side effects. The only concern that seemed prominent within the discussions was that FFs may interact with medication. These GPs were more concerned with their patients knowing the risks but giving them a better quality of life.

In relation to FFs being consumed along with medication, by some it was seen as beneficial in the case of side effects of diarrhoea from antibiotics or irritable bowel syndrome. Whereas, unlike the views of Thompson (2007) it was felt that cholesterol-lowering foods would not be needed if on a statin, as it would have a limited, if any, extra benefit. Another issue that the GPs had was the concern that FFs could be medicalising normal symptoms. Therefore, they may have difficult consultations with the 'worried well' patient, rather than the high risk patient. However, it seems that GPs use their role to persuade and influence patients into having medication because the GP thinks that is the most effective. These findings imply that GPs view FFs with some scepticism, and view an overall healthy lifestyle as a more important preventative method.

Limitations

The FF packaging was utilised in the interviews to aid discussion and was presented at a different time for each participant. The participants who saw the packaging at the beginning of the interview may have had their ideas of FFs pre-shaped; however, it did aid the discussion, resulting in more themes emerging. Those who saw no packaging expressed only their own views of FFs, however, the discussion was limited, with less themes emerging compared with the other participants. The participants, who saw the packaging part way through the interview, were able to describe their initial views of FFs. Upon seeing the packaging, further ideas, thoughts and topics emerged. This strategy was useful to find the appropriate time to introduce the packaging. However, by introducing the packaging at different times there was a lack of consistency, which means some data could have been missed or misconstrued.

Other issues with this study are that owing to only one person conducting the analysis, the data could have been subjective. However, the researcher attempted to keep the data as objective as possible by reporting only what the participants said, and not their supposed meaning. In addition, the analysis was conducted as part of an M.Sc.; however, the themes were discussed and agreed upon by the research team. A final issue is that this study only involved academic GPs. Although these GPs may have been more knowledgeable, they may also have less day-to-day experiences in practice and limited experience of FFs.

Conclusion

The implications for this study are that it demonstrates the current views and concerns of GPs towards FFs, which have not been explored before in the United Kingdom. This research has illuminated the issues around FFs that need to be addressed for GPs to be able to discuss such products within practice. It appears that GPs do not see FFs as being relevant to discuss unless they are brought up by their patients. Even then they feel as though they have limited knowledge of these products. Therefore, training on health promotion and FFs for GPs could be addressed.

Further research could be conducted with a similar method but with nurses and dietitians, similar to the research by Landström *et al.* (2007). In addition, this research could be expanded to GPs who primarily work in irritable bowel syndrome clinics and cardiac care units, where FFs may be discussed by patients more often. A comparison could be made among health professions to see if they have any concerns about patients consuming FFs.

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Conflicts of Interest

None

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation (NHS Sunderland Research Ethics Commitee) and with the Helsinki Declaration of 1975, as revised in 2008.

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