Legumes and Well-Being in the Elderly: A Preliminary Study

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Abstract

There has been considerable recent interest in associations between diet and subjective reports of wellbeing (stress, mental health, cognitive and physical functioning). Such effects have been considered across the lifespan and benefits often observed in all age groups. Effects of diet are often easier to detect in the elderly, either because of the longer period of consumption or the decline in functioning associated with aging. The present paper reports results from surveys examining associations between frequency of consumption of peas and beans and wellbeing. No significant associations were observed in younger samples but in the elderly more frequent consumption of peas and beans was associated with reduced stress, emotional distress, anxiety, depression and somatic symptoms. Further research is now required to examine underlying mechanisms and assess the practical implications of these findings.

Keywords: Legumes, Well-being, The elderly

1. Introduction

Recent research suggests that diet influences wellbeing (Smith, 2005). Initial research has been based on epidemiological findings and shown that breakfast is associated with subjective reports of better mental and physical health and functioning across different age groups (e.g. Smith, 2001). Such research has also examined effects of macronutrients (e.g. fibre – (Smith, 2010)) micronutrients (Smith, et al., 1999) and whole diets (McMillan, et al. 2011). The aim of the present research was to examine whether frequency of consumption of legumes was associated with increased wellbeing in different age groups.

Legumes include all forms of peas and beans. They provide a range of essential nutrients including protein, low glycaemic carbohydrates, dietary fibre and minerals and vitamins (Munro 2007). Dietary guidelines recognize the favorable nutrient profile of legumes and they are considered both as vegetables and alternatives to lean meat, fish and poultry. Evidence is strengthening for the role legume consumption can play in disease protection. However, overall legume intake is low in many countries especially in children. This has limited research on legumes and health, and it is certainly the case that the scientific literature on this topic is not as extensive as that for cereal grains. The emerging picture is that eating legumes can play a role in preventing chronic diseases such as cardiovascular disease, diabetes and obesity (Kushi, et al. 1999).

The benefits of legumes may depend on them being part of other dietary profiles (e.g. the Mediterranean diet). Indeed, results from the ATTICA study show that the Mediterranean diet was associated with reduced levels of biomarkers associated with metabolic syndrome (Panagiotakos, et al., 2007). The EPIC study supports these findings with clinical data: the Mediterranean diet was associated with 14% lower mortality and high legume consumption was calculated to contribute about 10% of this protective effect of the diet (Trichopoulos, et al., 2009). A seven year longitudinal study of older people in different cultures (including Japan, Sweden, Greece and Australia) found a 7-8% reduction in the risk of death for every 20g increase in daily legume intake (Darmadi-Blackberry, et al., 2004). Similar benefits have been in epidemiological studies in the USA (e.g. NHANES – (Bazzano, et al., 2001). The reduced risk of cardiovascular disease associated with the consumption of legumes may reflect the hypocholesterolaemic effect of their fatty acid profile, dietary fibre, isoflavones and antioxidants. Indeed, legumes are good sources of saponins and phytosterols which may assist with decreasing absorption of cholesterol from the gut.

A systematic review and meta-analysis of randomized controlled trials of legumes and diabetes (Sievenpiper, et al., 2009) concluded that legumes lowered fasting blood glucose and insulin. Legumes may, therefore, reduce the risk of type 2 diabetes by effectively lowering the GI of diets through slowed absorption. Improved glycaemic control may also explain findings linking legume consumption with weight loss and obesity with low ingestion of legumes. Legume consumption has also been associated with reduced risk of certain cancers although the mechanisms underlying such effects are not clearly understood.

One mechanism through which diet may influence chronic disease is through wellbeing. Research shows that those with mental health problems are at a greater risk of developing subsequent chronic disease (Stansfeld, et al., 2002). The aim of the present research was, therefore, to examine associations between frequency of consumption of peas and beans and subjective reports of mental and physical health. This was done in three groups: young adults, a middle-aged working sample and a more elderly sample.

2. Method

A common methodology was used across the three studies. Consumption of peas and beans was assessed using a food frequency questionnaire (Yarnell, et al., 1983) with the participants being asked:

How frequently do you eat peas or beans?

Responses were measured using a 5-point scale with the following categories: Never; Less than once a week; once or twice a week; most days; and every day.

The following questionnaires were administered to measure mental and physical health:

Stress :	Perceived Stress Scale (Cohen & Williamson 1988)
Depression :	Beck Depression Index (Beck 1967)
Anxiety :	Spielberger Trait-State Anxiety Inventory (Spielberger et alk., 1970)
Emotional Distress :	Emotional distress scale of Profile of Fatigue Related States (Ray et al., 1992)
Somatic symptoms:	Somatic symptoms scale of Profile of Fatigue Related States (Ray et al., 1992)

All studies were carried out with the informed consent of the volunteers and approval of the local ethical committee.

Study 1:

This study used a student sample (N=189; 49% Female; age range: 18-30 years). There were no significant associations between frequency of legume consumption and the wellbeing measures (see Table 1).

(Table 1)

Study 2:

This study used a general population sample (N= 126; 63% Female; age range: 25 to 55 years). There were no significant associations between frequency of legume consumption and the wellbeing measures (see Table 2).

(Table 2)

Study 3:

This study used an older sample (N=205; 55% Female; age range: 60 to 80 years). There were significant associations between frequency of legume consumption and the wellbeing measures (see Table 3). Those with more frequent consumption of peas and beans reported lower levels of stress, emotional distress, anxiety, depression and somatic symptoms

(Table 3)

3. Discussion

The present studies demonstrated that higher consumption of legumes is associated with increased wellbeing in the elderly but not younger samples. Such a result, suggesting a cumulative benefit of a higher frequency of consuming legumes, could be explained by a number of the mechanisms underlying other health effects (Smith, 2005; Munro 2007; Kushi et al., 1999; Sievenpiper et al., 2009). Further research is now required to exclude other possible explanations of the findings. For example, consumption of peas and beans may be associated with other dietary features and it may be these correlated attributes that are responsible for the observed effects. The next step, therefore, is to conduct multi-variate analyses considering many aspects of diet, both alone and in combination (Smith, 2005). A second requirement is for better measures of consumption. Food frequency clearly gives no indication of amounts consumed and this needs to be rectified in further research. It is also important to obtain

better information on causality. In cross-sectional analyses there is always the possibility that it is wellbeing that is influencing diet rather than the other way around (Smith, 2005). Intervention studies are now required to investigate this further (Smith, 2010). It is also important to extend the research by considering other outcomes. Reduced wellbeing is related to chronic disease and it is important to determine whether the effects observed here are an initial part of a diet-health pathway. Aging is also associated with cognitive decline and it is important to investigate both acute and longer term effects of consuming legumes on cognitive functioning. Legumes are often considered in the context of whole grains. The methodology used here can now be used to investigate associations between frequency of consuming whole grain foods and wellbeing.

In conclusion, the present studies demonstrate that a higher frequency of consumption of peas and beans is associated with less stress, anxiety, depression and physical symptoms in the elderly but not in younger groups. Further research is required to extend these findings and elucidate underlying mechanisms and practical implications of the effects.

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Table 1. Associations between legume consumption and well-being measures (scores are means, s. e. s in parentheses) (Study 1. Students)

	Low consumption (once or twice a week at most)	High Consumption
Perceived Stress	20.3 (0.6)	21.2 (0.9)
Emotional Distress	30.0 (1.2)	30.6 (1.5)
Anxiety	37.1 (0.7)	37.3 (1.0)
Depression	4.4 (0.4)	5.0 (0.7)
Somatic Symptoms	22.1 (0.7)	22.2 (0.7)

Table 2. Associations between legume consumption and well-being measures (scores are means, s. e. s in parentheses) (Study 2. General Population)

	Low consumption (once or twice a week at most)	High Consumption
Perceived Stress	23.2 (1.0)	21.5 (1.1)
Emotional Distress	32.6 (1.8)	32.3 (2.2)
Anxiety	31.2 (1.0)	30.6 (1.1)
Depression	7.3 (0.7)	7.4 (0.9)
Somatic Symptoms	22.3 (0.7)	25.1 (1.6)

Table 3. Associations between legume consumption and well-being measures (scores are means, s. e. s in parentheses) (Study 3. Elderly Population)

	Low consumption (once or twice a week at most)	High Consumption	
Perceived Stress	16.0 (0.6)	13.6 (1.0)	$p<0.05$
Emotional Distress	28.0 (1.0)	24.6 (1.2)	$p<0.05$
Anxiety	31.2 (0.7)	28.6 (1.0)	$p<0.05$
Depression	6.3 (0.3)	4.7 (0.5)	$p<0.05$
Somatic Symptoms	23.2 (0.6)	20.8 (0.6)	$p<0.01$

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