
Addressing Vegetarians' Pessimistic Beliefs Towards Plant Oils to Override Consumer Behaviour - Theory of Planned Behaviour

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Abstract: Lipids are an essential part of the human diet affecting biological processes and reducing disease development. Plant-based oils, specifically sterols, are essential compounds for cellular composition and proliferation. As vegetarians refrain from consuming animal products, although many versions of this lifestyle exist, plant oils are their only source of fat intake. Extracted plant oils are an essential source of fats and fatty acids; hence this study aims to address vegetarians knowledge and pessimistic perceptions of fats and plant oils to understand the vegetarian consumer choice through the Theory of Planned Behaviour. Despite extensive research on the vegetarian lifestyle, a pessimistic approach to understanding consumer choice in plant-based oils has been less than satisfactory. A qualitative research design was selected to conduct one-to-one in-depth interviews with seventeen vegetarian participants that met the eligibility criteria. Recruitment was based on a purposive sampling drawn from social media groups to provide an insight into the pessimistic views of vegetarians on plant-based oils. A thematic analysis was conducted using the computer-assisted software package NVivo 12 Plus. Pessimistic views and lack of knowledge on the functionality of fats and fatty acids may lead to nutrient deficiencies. The study has identified three major themes related to vegetarians pessimistic views towards plant oils: 1) pessimistic misconceptions of fats and plant-based oils, 2) pessimistic views on plant-based oil harvesting and manufacturing, and 3) plant-based oil challenges and pessimistic health claims. These conflicts are affecting the nutritional status of vegetarians by either avoiding or lessening extracted plant oils in their diet due to a lack of misinformation and uninformative nutritional labelling. The present study highlights the vegetarians' pessimistic perceptions of extracted plant oils. It argues that vegetarians' are more prone to nutritional deficiencies due to a lack of knowledge on the functionality of fats and fatty acids and highlights the need for informative food labelling to enable consumers to make comprehensive food choices.

Keywords: Vegetarians, Plant-based Oils, Pessimistic View, Lipids, Fats, Theory of Planned Behaviour

1. Introduction

Lipids are an essential part of the macronutrients needed in our daily diet; however, saturated and trans-fatty acids hold a notorious reputation for contributing to cardiovascular disease when consumed excessively [1]. Moreover, socioeconomic changes due to expeditious living standards have altered dietary patterns, causing an increase in saturated fats consumption, which in developing countries is the leading cause of adults mortality [2].

Over the last ninety years, there has been ample research to determine the distinction of plant-based oils regarding fats

and fatty acids in human nutrition [3]. As lipidomic research is rising, certain fatty acids and their by-products have been attributed to exercise cancer, cardiovascular, metabolic and neurodegenerative protective purposes [4].

The vegetarian diet usually lacks meat and fish, although many variations exist and base their nutrients derived from plants [5]. Such plant-based diets still require lipids obtained from plant sterols [6].

This study investigates vegetarian views on fats, specifically extracted vegetable oil consumption in the vegetarian diet. This phenomenological study delves into the arguments regarding lipids to understand participants'

nutritional knowledge and negative perception of the functionality of oils by gaining a deeper understanding of their behavioural disposition towards plant-based oils. Therefore, this study offers a new pessimistic outlook on the perceptions of vegetarians towards fats and fatty acids, mainly plant-based oils, in their diet through a Theory of Planned Behaviour lens.

The following research question was proposed to gain an in-depth understanding of vegetarians' perceptions: *What negative perceptions keep you from including plant-based oils in your food choice?*

The theoretical framework of the Theory of Planned Behaviour (TPB) has been employed to drive this study. This framework is understood to predict and better understand the behavioural intentions driving the behavioural control [7] that can be applied to comprehend consumer behaviour.

2. Literature Review

2.1. Importance of Fats

Lipids are a crucial part of the human diet, essential for biological activities at a cellular level and more extensive tissue processes, whereas diseases manifestation may occur when the body is deprived of such nutrients [4]. Empirical evidence has supported the claim that fats and fatty acids are critical nutrients needed for embryonic and infancy development; moreover, certain fatty acids have been praised for their protective benefits against certain chronic diseases, a far cry from their original role to fuel the body [2].

2.2. Fats and Disease

A high fat intake can lead to abnormal lipid levels in the body, instigating interrupted blood flow that can forebear many diseases and conditions [8]. Consequently, high cholesterol, stroke, coronary and vascular disease are high risks to morbidity and mortality [6]. Many scholars and scientific associations have recommended changing eating habits to prevent cardiovascular disease, including the idea that the Mediterranean and plant-based diets are lower in saturated, trans and solid fats [1].

2.3. Vegetarian Diet

Vegetarian and vegan diets are rising for several reasons, including improved overall health [5, 9, 10]. The vegetarian diet, consisting of abstaining from animal products, has been linked to a positive health outcome [5], including reduced BMI and risk of cardiovascular diseases, such as stroke, myocardial infarction and coronary artery disease [1]. The current literature on the effects of plant-based diets on plasma lipids suggests that abiding by a vegetarian diet reliably reduces the plasma cholesterol levels due to the lack of animal products compared to those following an omnivore diet [6]. Baswedan, Roslaeni & Suwarma (2021) [8] drew parallels between plant-derived diets and good lipid levels, suggesting that vegetable products contain fewer fats and cholesterol, reducing "bad" low-density

lipoprotein (LDL) cholesterol and triglycerides levels, and not the "good" high-density lipoprotein (HDL) levels. However, their empirical work did not find a significant difference in good lipid profile between vegetarian and non-vegetarian subjects. These findings are less surprising if we consider that most of the vegetarian subjects (95%) included in this study consumed some animal products, including milk and eggs and that the participants' age ranged between 18 and 23 years. Saintila et al. (2021) [11] also conducted a cross-sectional study comparing vegetarians and non-vegetarians to determine their overall anthropometric profile. Here, correlations between vegetarianism and lower average weight, lower BMI, lower waist circumference and lower total cholesterol levels were statistically significant. Although this study included a vaster age range (18-59 years) compared to the latter, both studies lacked to disclose the duration the vegetarian subjects had been following this diet, which could have been helpful for this correlation.

A meta-analysis focusing on five studies examining the role of vegetarian and vegan diets on plasma lipids argue in favour of plant-based diets owing to the significant lower blood lipids and overall reduced risk for cardiovascular disease [6]. The data provides convincing evidence demonstrating the mechanisms of plant-based diets to reduce plasma cholesterol by reducing fat intake, an increased intake of viscous fibre, and the effect of plant sterols on cholesterol binding.

2.4. Lipids Consumed in a Vegetarian Diet

Lipids are a range of natural biomolecules, including fatty acids and their by-products, distinguished by their chemical structure [4]. Although fat is an essential part of the diet, trans-fat causes LDL cholesterol to rise, increasing the risk for cardiovascular disease [12]. Vegetarians following a plant-based diet have lower cholesterol levels due to reduced saturated and total fat intake, replacing these with plant sterols, which diminishes cholesterol through absorption [6]. Extracted plant-based oils are mainly triacylglycerides; however, they vary in fatty acids (saturated and unsaturated), vitamins D and E, and sterols according to the oil type [13]. Such oils are essential to vegetarian diets, especially vital fatty acids that cannot be synthesised in the body; omega-3 (alpha-linolenic acid) and omega-6 (linoleic acid) [3, 14]. Vegetarians need to acquire oils from a plant source as part of the human diet, including sterols: sitosterol, stigmasterol and campesterol, all supplied by plant-based oils [15].

Previous research has largely overlooked the possibility that vegetarians may hold pessimistic views towards fats in their diet leading to unbalanced eating habits. Despite decades of research on nutrition in vegetarians, understanding specific macronutrient knowledge and perceptions of plant-based oils have been less satisfactory. Hopefully, understanding vegetarian perceptions on their dietary intake of fats and how they perceive the functionality of this nutrient could be critical in understanding the misconception of plant-based oils and their functionality.

3. Methodology

A qualitative research study was conducted between May and August 2021 with a purposive sample to understand the pessimistic perspectives of extracted plant-based oils in vegetarian nutrition. Phenomenology was chosen as a research method to gain a deeper understanding of participants' experiences and real-life perceptions of the functionality of fats within this dietary lifestyle through interpreting narratives to yield the pessimistic relationship. Vegetarians were explicitly chosen for this study as their lipid intake is limited due to the lack of animal fats. Collecting vegetarians pessimistic views is essential to reorientate an accurate perception that can shine a light on overlooked realities to overturn the negative into a constructive mindset once we are willing to address the negative, thus hopefully creating a positive outcome.

Proposing pessimism as a philosophy driving the study is a fundamental purposeful approach to understand in a more original form the underpinning of participants' planned behaviour towards using extracted oils in the vegetarian diet. Dienstag (2006, p. ix) [16] draws attention to how pessimism can be a liberating philosophy as it provides a new position, thus a robust underpinning for research.

3.1. Participants and Data Collection

The participants included vegetarian adults residing in Malta, following this lifestyle for longer than one year. A vegetarian diet was categorised for this study as avoiding meat and fish consumption. Recruitment occurred through an online social media page dedicated to vegetarians to reach the purposive sample. Twenty vegetarians responded to the initial call, where the interviewer contacted each by email to attend a focus group. Two initial focus groups were held to explore vegetarian beliefs on the importance of fats in a vegetarian diet and their perspectives on plant-based oils in their diet. The focus groups yielded information regarding participants' knowledge on fats functionality; however, they did not provide rich descriptive data about their beliefs and use of plant-based oils in their daily diet. Thus, in-depth interviews were carried out to explore their situations and practices, being the primary data collection source for this study.

3.2. The Interviews

As two participants denied further participation, in-depth semi-structured interviews were performed with seventeen participants via an online platform that permitted the meetings' audio recording transcription. All interviews lasted between 45 and 55 minutes that were conducted in English. The interviewer was trained and experienced in qualitative interviewing and asked open-ended questions related to how fats were integrated with their vegetarian diet and their life experiences with purchasing and consuming plant-based oils. Probes were utilised to gain descriptive information on participants' pessimistic views regarding their life experiences concerning plant-based oils. The foremost topics and questions for this study were:

1. Importance of fats in the vegetarian diet:
Could you discuss your perception of the importance of fats as part of a diet?
2. Use of plant-based oils in the vegetarian diet:
How do you integrate plant-based oils into your diet?
3. Challenges integrating plant-based oils in the vegetarian diet:
Looking back at your experiences purchasing and using plant-based oils, what challenges did/do you face?

The interviewer concluded each interview by asking each participant whether they had any concluding comments or observations. Authenticity and credibility were enhanced by member checking, where participants were later contacted by telephone to verify the information.

3.3. Analysis

The interviews were fully transcribed and analysed using the computer-assisted data analysis software (CAQDAS) package NVivo 12 Plus, a qualitative software created by QSR International (Melbourne, Australia), where transcriptions were classified and group-specific codebooks emerged from the data analysis. Data were further analysed in a data-driven manner rather than a structured method; hence findings emerged in iterative patterns guided by the comparisons found in the discourse resulting in logical and coherent practicable portions, where categories emerged by distributing similarities into manageable headings according to grouped concepts [17].

Themes extracted show definitive perceptions to emphasise the pessimistic views that inhibit the inclusion of plant-based oils further discussed in rich data sets theoretically supported by the Theory of Planned Behaviour to explain the behaviours or lack of including oils in vegetarian diets.

3.4. Ethical Considerations

Ethical approval was sought by MCAST ethical board prior to starting the project. Potential participants received information about the aim of the study on the social media platform page and were made aware that participation was voluntary and confidential. Participants had an option to leave their email address if they would like to be contacted to further participate in the one-to-one interview. An invitation was sent to those willing to participate with an explanation of the study, informed consent, and permission to audio record the interview beforehand.

To safeguard authenticity, a second independent researcher, familiar with the field of study, was brought on board to read, interpret and code the interviews for emergent themes related to pessimistic views, using an audit trail for debriefing. Both researchers analysed the data independently and met to compare the coding and interpretations before emerging the themes. The researchers discussed any inconsistencies and eventually arrived at a mutual agreement. The analysis focused on the negative aspects of plant-based oils and fats within the vegetarian diet, drawing attention to their eating practices' pessimistic and genuine boundaries.

3.5. Theoretical Approach

A basic theoretical framework for this study was adopted to address the vegetarian views on vegetable oil consumption to understand this population's nutritional knowledge on the importance of lipids. Exploring the negative perception may positively affect vegetarian consumer views on the functionality of oils by gaining a deeper understanding of their behavioural disposition towards plant-based oils. As this theory states, the final behaviour is based on the three belief combinations (see Figure 1): attitude towards the behaviour, subjective norms, and perceived behavioural control [7].

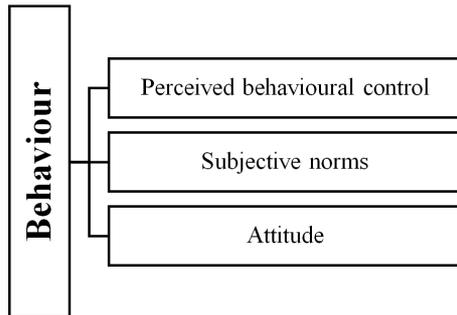


Figure 1. Three belief combinations.

Implementing the TPB may clarify the link between one's behaviour and the implications of their action by considering four main components; action (a specific action performed), the target (the targeted behaviour), context (in which situation) and time (when the behaviour occurs). As to answer the research question at hand, this theory can extend the investigation through the four components by understanding the behaviour to be accurately predicted and understood as shown in the following example: consuming plant-based oils (action), vegetarians (target), vegetarian diet (context) preparation of meals (time).

Using TPB may shed light on vegetarian behaviours towards using plant-based oils in their diet, or in this case, taking on a pessimistic stance, to understand the lack of inclusion of plant-based oils, gaining a further productive perspective.

4. Findings

The present study employed a qualitative approach to investigate pessimistic perspectives to understand vegetarian consumers' beliefs towards fats and extracted plant-based oils. The sample for this study included twenty vegetarians; however, 17 participants completed the focus group and the interview. Ten females and seven males participated in the study, ages ranging from 22 to 51 years old (mean of 32), all following a vegetarian diet for more than one year (mean five years).

The findings indicate that 70.5% (n=12) of the vegetarians participating in the study did not perceive fats as an essential component in their diet; furthermore, from these participants, 47% (n=8) stated that fats have no nutritional value

whatsoever. In addition, less than half of the total participants added extracted plant oils to food, whereas 59 % (n= 10) avoided extracted oils entirely due to negative associations. Through the data-led analysis, the following three themes emerged, highlighting the perspectives of the study's participants.

Theme 1: Pessimistic misconceptions of fats and plant-based oils

Contrary to the researchers' expectations, the data provided convincing evidence that most participants in the current study have the false impression that all fats, including plant-based oils regardless of the amount, are harmful to our health and need to be avoided in their diet. The data provided preliminary evidence that participants include fat in their diet from whole vegetables and seeds; however, extracted plant oils are associated with weight gain and illness, even in small to moderate amounts. When exploring further to clarify differences in plant-based culinary oils and how these affect choice, the general picture emerged that participants held negative views towards extracted oils in favour of 'healthier' alternatives. Representative texts to such data are shown below:

'Oils have no value to humans whatsoever. They are high in calorie intake, and even adding some olive oil makes me consume empty calories that I could include from elsewhere that are filling' - P3

'Healthy fats are okay, but oils (extracted) are not healthy fats. If they (fats) come from whole foods like nuts, seeds, and avocado, they are valuable, but added oil fats are not nutritionally valuable' - P16

Theme 2: Pessimistic views on plant-based oil harvesting and manufacturing

Some participants expressed their concern over the production process of plant-based oils and how such manufacturing supports human exploitation, deforestation and loss of biodiversity. Participants expressed reservations about using certain oils due to the ethical conflict and plastic packaging. Representative responses were:

'I am concerned with global impacts, apart from meat, fish and dairy, I avoid palm, almond and soy oil, as they are unsustainable.' - P2

'Some oils, for example, palm oils, are quite unsustainable and some rely on cheap/slave labour to be viable/profitable' - P12

Those with ethical issues voiced reservations regarding the production and processing of plant-based oils. Palm oil was discussed negatively due to species endangerment. Several participants articulated not wanting to buy products sold in plastic packaging and look for glass packaging instead.

Theme 3: Plant-based oil challenges and pessimistic health claims

A common theme that permeated most of the interviews was the lack of knowledge on different oil types and the quantity when adding plant-based oils into the vegetarian diet. Negative comments were surrounding plant-based oils and unwanted side-effects such as weight gain and gastrointestinal problems, including nausea and loose stools.

The dislike in texture and taste were also apparent. The criticisms regarding plant-based oils in the vegetarian diet also criticised the manufacturer for not including basic information on the packaging. Examples include:

'I am scared of weight gain, and the packaging does not help, as I never find the recommended amount on the packaging.'-P5

'Lots of junk out on the shelves being repackaged with new buzz words to make it seem healthier when its the same artery-clogging food'- P8

5. Discussion

Justifying behavioural disposition is a complex task, where social attitudes, personality traits and environmental factors play an essential role in human behaviour [18]. The study analysed the relationship between vegetarians and their views on fats, specifically plant-based oils, providing convincing evidence against the use of plant-based oils in their diets for the claim of health and ethical reasons. The findings suggest that the participants in the study had little knowledge of the functionality of oils and fats as a macronutrient.

5.1. Lack of Nutritional Knowledge

The findings are consistent with previous results showing how both vegetarians and non-vegetarians hold misapprehensions towards dietary needs and nutrition, resulting in unbalanced diets [11]. As Leitzmann (2014) [9] points out, vegetarians may be prone to nutrient deficiencies when their motivation to follow such a diet is based on ethical, ecological, moral, and religious/spiritual motives rather than a health incentive.

Although the vegetarian diet runs less risk for cardiovascular disease [1], sufficient dietary requirements are needed to maintain a balanced diet [11]. As the vegetarian movement increases [5], barriers to following a plant-based diet, including lack of knowledge of preparing vegetarian foods and nutritional deficiencies, have been identified [19]. Although edible oils are unequal and mainly composed of triacylglycerides, the primary source, plant sterols, provides a range of health benefits incorporated in various dishes [13]. Moreover, understanding that not all oils are equal within nutritional importance is the first step to maintaining optimal health [15]. The existing literature emphasises that vegetarians may reduce the value of their nutritional status and succumb to nutritional deficiencies when uninformed on nutrients, which is more likely in those with ethical and cruelty-free ideologies [9]. Contrary to what the participants in this study believe, vegetable oils, which play an essential role in cell structure and function, were consuming 2g day⁻¹ have been found to reduce plasma cholesterol effectively [15]. Ferdowsian & Barnard (2009) [6], in their study on the effects of plant-based diets on plasma lipids, openly acknowledge that long-term adherence to a vegetarian diet reduces the plasma triglycerides level, compared to non-vegetarians that obtain fat from animal products.

5.2. Ethical and Health Perceptions

The data provides convincing evidence of a strong association between negative attitudes towards plant-based oils and their avoidance in the diet. Ethical reasons for avoiding oils due to plastic packaging, deforestation, and species loss were expressed. In vegetarianism, moral and environmental justifications for omitting meat to reduce climate change are described [11, 20]. Thus, such consumers could avoid unsustainable products through excess farming in developing countries, causing ecosystems to collapse. As participants expressed plant-based oils as unhealthy, science-based health claims on food package labels could aid the consumer make supported decisions between different oils on the market, reducing coronary heart disease [21].

Godfray et al. (2018) [20] have put forward the hypothesis that health and environmental issues can alter purchase and consumption behaviour and suggests nutritional labelling for consumers to make conscious choices and also raised tax, that could result in economic motives to avoid saturated oils compared to oils high in oleic acid.

5.3. Attitudes Towards Plant-based Oils

Ajzen (1991) [18] carried out extensive research on the TPB, highlighting the person's perception (perceived behavioural control) to have a direct impact on the intention to carry out a behaviour. Highlighting the functionality and health benefits gained from plant-based oils, including fatty acids, vitamins, and bioactive compounds [13], could tackle the pessimistic health perceptions analysed in the data. In light of the findings, a few conclusions can be drawn from the pessimistic views towards plant-based oils, indicating negative behavioural predictors in vegetarian consumers. A further complication for the present hypothesis is that there is still doubt about what can be done to change participants attitudes and intentions, and ultimately their behaviour towards including plant-based oils in their diet. Especially considering that previous studies using TPB indicate that past behaviours affect future behaviour and predict future intentions and attitudes subjective to perceived behavioural control [18].

Kan & Fabrigar (2017) [7] remind us that subjective norms govern behaviour; thus, what is essential to that person determines motivation and beliefs. The idea that vegetarianism is based on different ideologies, ranging from environmental, ethical, health or religious reasons [5], if the individual perceives plant-based oils to interfere with one of these motivations, their intention to perform a behaviour is hindered or ceased [7].

The research illustrates the vegetarians' perceptions of plant-based oils, highlighting a pessimistic view that cannot be generalised beyond the subset examined. The findings suggest a need for future research on a larger population to assess the extent to which vegetarians perceive plant-based oils negatively and possibly correlate the nature of their diet choice. Future studies will have to take the ethics of processing into account to address this phenomenon in more detail.

6. Conclusion

Maintaining the right amount of nutrients is tedious enough; however, vegetarians are more prone to nutrient deficiencies [11]. Lack of knowledge regarding plant-based oils and the importance of fats for nutrition was the most evident finding in this study, followed by ethical considerations for harvesting and manufacturing these culinary oils and undesirable side effects. These findings would suggest a pessimistic view towards plant-based oils, and when considering the TPB, that examined predictive behaviours of this population and projected a negative behavioural intention to use plant-based oils. Considering the results, plant-based oils could be promoted by addressing health and ethical concerns, hopefully shifting pessimistic perceptions to healthy positive dietary patterns.

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