



Scientific paper

We want to be normal! Perceptions of a group of Brazilian consumers with coeliac disease on gluten-free bread buns[☆]



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ABSTRACT

Background: A gluten-free diet is the only available treatment for coeliac disease. Adherence to the strict diet may be compromised by social, economic and sensory aspects. This qualitative study interviewed adult individuals with coeliac disease to identify perceptions on characteristics of available and ideal gluten-free breads. Gathered information could inform the development of an experimental product with optimal sensory characteristics.

Methodology: Individual interviews, thematic analysis of transcripts.

Results: Available gluten-free bread options were unanimously criticised. Ideal characteristics matched the ones of the savoury French bread roll traditionally consumed in Brazil by the general population. Convenience and social life were the main verbalised concerns. Nutritional composition and price were considered secondary to optimal sensory characteristics in a gluten-free bread bun.

Conclusion: Participants had strong views on not being able to eat what they considered normal bread, and a gluten-free bread bun with the right sensory qualities meant more than just food. It represented the possibility of returning to the social routine they had previous to diagnosis. Identifying such expectations can not only contribute to the development of better products intended for their consumption, but also to gain insight on the daily difficulties faced by a good part of the population.

Introduction

Coeliac disease (CD), an immune-mediated systemic disorder elicited by gluten and related prolamins in genetically susceptible individuals, affects around 1% of the world population (Husby et al., 2012). Brazil is a country of more than 200 million people, representing approximately 52% of the South American population and 3% of the world's population. In general, Brazilians trace their origins to the original Amerindians and two main sources of immigration: Africans and Europeans. Northern Brazilians are mostly of Amerindian ancestry while Southern and South eastern Brazilians are mostly of European origin, namely Portuguese, Germans and Italians (Giolo et al., 2012). This probably explains why prevalence of CD in Brazil is around 1%, similar to European countries (Crovella et al., 2007; Oliveira et al., 2007).

To date, the only available treatment is the adoption of a gluten-free

diet on a permanent basis. Adherence to the strict diet however, has been found to be compromised by social, economic and sensory aspects (Green et al., 2015).

An audit-type study conducted in a Brazilian state's capital identified only 188 varieties of gluten-free products (fifteen breads, 9%) available at the few stores certified by the Brazilian Coeliac Association. Products were 26–85% more expensive than gluten-containing similar counterparts available in regular stores. Gluten-free breads were 33% more expensive ($p < 0.01$) (do Nascimento et al., 2014a). Scarce availability and high cost of gluten-free options may difficult regular consumption and compromise the treatment of CD (Estévez et al., 2016; Singh and Whelan, 2011).

Gluten contributes to unique and essential qualities of dough, such as water absorption, cohesiveness, elasticity and viscosity (Wieser, 2007). Its absence from gluten-free formulations results in liquid batters, compromising both texture and colour after baking

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(Gallagher et al., 2004). Gluten replacement in baked products has proven a challenge for the food industry over the years, hence the high number of academic studies on the evaluation of technological properties and development of gluten-free products (Sciarini et al., 2010).

Arendt et al. (2008) report after extensive worldwide market research, that the majority of gluten-free breads currently on the market are of very poor quality, and that good-quality gluten-free bread can only be produced if a range of flours and polymeric substances which mimic the viscoelastic properties of gluten are included in the gluten-free formulation.

It is not enough for a product to present excellent chemical, physical or microbiological characteristics if it does not meet the expectations and needs of the final consumer (Tzia et al., 2015). Although appearance, aroma, taste and texture also play a key role in the appreciation and consumption of foods in general, not much attention has been given to the opinion (e.g. availability and expectancies) of individuals with coeliac disease on products intended for their consumption (Laureati et al., 2012).

Bread, usually made of yeast-fermented wheat dough, is eaten worldwide as a staple food (Hager et al., 2012). As an important source of gluten, regular bread must be avoided by individuals with coeliac disease (Gallagher et al., 2004). A survey-based study regarding availability of gluten-free processed products identified that Brazilian individuals with coeliac disease were very critical of the available gluten-free foods in general, but especially bread (do Nascimento et al., 2014b).

Therefore, the present study's aim was to gather information and insight from coeliac consumers on the ideal characteristics of gluten-free bread, to inform research on the development of a gluten-free bread formulation. After conducting a systematic search to review the international literature on the topic, we were not able to identify studies employing the same design.

Methods

Participants from a convenience sample ($n=91$, 88% women) who took part in a previous survey study employing a questionnaire regarding availability of gluten-free processed products in general (do Nascimento et al., 2014b) were contacted and invited to share their ideas on characteristics of gluten-free breads in the present study.

Ethical approval for the study was obtained from the institution's research committee, and participants were recruited via the Brazilian Coeliac Association. All were aged 18-plus, with confirmed diagnosis of coeliac disease. All lived in the capital city of a southern Brazilian state, inhabited by over 400,000 people. Only three supermarkets and six natural product stores were listed by the Brazilian Coeliac Association as reliable gluten-free product retailers in the city (do Nascimento et al., 2014a).

Face-to-face interviews were conducted and audio recorded by the same trained researcher (first author) in a place, date and time set by each participant. No time limits were established. A piloted open-ended question guide was employed. The first question was 'Let's talk about bread... what you can say about the gluten-free breads you know? Following questions were designed to get individuals thinking about and describing characteristics of the bread they would like to eat (Fig. 1). Questions were based on literature-reported issues found to hamper the consumption of gluten-free products and the health of individuals with coeliac disease. Recordings were transcribed verbatim and evaluated by thematic analysis method, using systematic and objective procedures (Braun and Clarke, 2013).

Repeated careful readings of the transcribed material were carried out by the interviewer (first author) while listening to the audio feature to assess intonation and inflexion of speeches. This enhanced familiarity with the transcript's content. The material was then coded so that raw data (words or phrases) were flagged according to their meaning. Identification of patterned meanings across the dataset led to central

concepts which were revised and refined to generate themes (Braun and Clarke, 2013) (Fig. 1).

Results

Twenty-one individuals (18 women) aged 24–78 years old were interviewed. Time of diagnosis ranged from 11 months to 20 years, none of the participants had been diagnosed in childhood. Participants' characteristics are described in Table 1.

Thematic analysis of the interview transcripts led to the creation of four general themes. "Physical characteristics" and "social impact" were the ones with the highest number of comments. The "social impact" theme emerged voluntarily from participants speeches. Other two themes were nutritional value, and economic aspects.

When generally talking about available gluten free breads, participants mentioned mostly derisive characteristics. Texture received the highest number of negative comments. All participants, but especially those more recently diagnosed, described it as *crumbly, rubbery, hard, heavy, dry, and doughy*. Other aspects mentioned were that most breads available were sweet-tasting, mostly sold frozen, had high energy and fat content, and possibly contained great amounts of additives and preservatives.

There was general agreement among participants that the ideal gluten-free bread should have a crispy crust and a soft crumb. The French bread roll traditionally consumed in Brazil was often mentioned as the best example, and reported as a much missed staple food.

"Probably because [bread] is the worst gluten-free product available... because it is awful most of the time... I think the ones I eat are not so bad if I purchase them fresh or toasted... if not, it is quite impossible to eat. Not to mention that at breakfast it is what we're culturally used to eating..." (Female, 30 years, 5 years of diagnosis).

"Oh I think if I had to choose one it would have the texture of French bread, meaning a crunchy crust and soft crumb, because the only type of bread we see around is in fact rubbery looking bread. I think if I had to choose the ideal bread it would be the traditional French bread, crunchy on the outside and soft on the inside". (Male, 39 years, 2 years of diagnosis).

Participants stressed the need of a practical, versatile savoury bun, suitable for sandwich making – and again mentioned the French bread roll as a reference. Easy access to a ready-to-eat freshly baked product was also considered important, preferably from a good number of establishments, in order to avoid the need for heating or toasting bread before consumption.

"Most gluten-free breads I know [...] are sold frozen, and I want fresh bread. I do not want frozen bread, which I will take out of the freezer, microwave and it will taste like micro waved rubber". (Female, 37 years old, 5 years of diagnosis).

Regarding taste and smell, once again French bread was the example. Because of the wider variety of gluten-free sweet products in the market, according to the interviewees there is a greater need for savoury breads, not stuffed or seasoned, suitable for sandwich-making. Convenience and versatility were highly praised. It was also mentioned that sliced bread could be sold in small packages with few slices, due to the fact that in many households there is only one person with coeliac disease.

"Shape is very important, it is essential... to make a sandwich... a roll or a bun to make a hamburger or a hot dog"(Male, 39 years, 2 years of diagnosis).

Although no questions addressing specific social issues were asked, participants spoke passionately about not being able to eat the same bread as the population in general. Such comments were voluntarily shared, mentioning the importance of socialisation among people with and without coeliac disease. At various times participants mentioned the word "normal" or expressed a desire for "normality" to describe and express the difficulties regarding food intake and food's social aspects.

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