ORIGINAL ARTICLE

The influence of ethnic identity on peruvian quinoa consumption: a top lima and modern metropolitan lima approach

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Abstract

The International Year of Quinoa (IYQ) (2013) showcased quinoa to the world and generated a rapid expansion in international demand for quinoa. It also increased the level of consumption in Peru. Peruvian ethnic identity reflects the food culture of origin. This research aims to determine the relationship between ethnic identity and other Theory of Planned Behavior factors on quinoa consumption intention and frequency of consumers in Top Lima and Modern Metropolitan Lima, Peru. A survey of 381 respondents was conducted between April and September 2017, and structural equation modeling was used to analyze the data. Contrary to expectations, intention and frequency of consumption of quinoa were negatively affected by "ethnic identity" ($p < 0.05$). This result is related to the promotion by the IYQ and Marca Perú (brand name Peru) and the gastronomic boom.

Keywords: *Chenopodium quinoa* Willd., Quinoa, Consumption, Culture of origin, Gastronomy, Health, TPB, Ethnic identity, Peru

Introduction

Latin-America produces a wide variety of crop species, including quinoa, kañiwa, amaranth, chia seeds, maca root, acai, sacha inchi [34, 37], and legumes. There is a growing consumer interest in these exotic crops due to their contributions to health and nutrition [23, 34, 37]. They are commonly referred to as "functional foods," which are food items that have health benefits beyond those of basic nutrition [23, 34] as they are purported to improve health and well-being and reduce the risk of a range of diseases [23, 34, 37]. Quinoa (*Chenopodium quinoa* Willd.) is a food grain that originated in the Andean region of South America. This Andean grain has now become popular worldwide because of its ethnic qualities associated with historic-cultural traditions [15] and healthy image [18]. To promote consumption of this

nutritious grain around the world, the United Nations declared the year 2013 as the International Year of Quinoa (IYQ) [12]. Since then, significant promotion has been carried out to boost the consumption of Peruvian quinoa internationally [30]. The "Peruvian gastronomic revolution" [25] not only consolidated the visibility of Peruvian cuisine abroad [28], but also made a mean of national identity [28, p2]. Progressively, people who have never consumed ethnic food before have begun to take pride in Andean ingredients and their great potential [28, 29]. Because of the large advertising campaigns of Marca Peru (brand name Peru) [29] and IYQ, the "golden grain of the Incas" has been revalued and consumption by the ordinary consumer in Peru has increased [29, 32]. From 2000 to 2014, the per capita consumption of quinoa among Peruvian citizens increased around 129%, from 1.10 to 2.54 kg/person [30]. In Lima, the Peruvian capital, and Callao, 85.4% of households declared that they consume quinoa [4].

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Ethnic identity is increasingly recognized as crucial to the psychological well-being of members of a certain ethnic group [38]. Based on the social identity theory, it would be expected that ethnic identity would include ethnic attitudes and a sense of group belonging [36]. The concept of ethnic identity is that a self-identification process in language, religion, values, moral affairs, and behavior takes place at a personal level in relation to a given social group with which the individual shares similar values (or cultural affairs) [39]. People who belong to and identify themselves with a specific ethnic group would tend to incorporate the habits and traditions of their culture and differentiate themselves from other ethnic groups [10]. The research of Shoham et al. [41] confirms that migrants' ethnic identification conflicts may translate into positive or negative predispositions toward purchasing products because of the country with which they are associated.

Another important concept is "ethnic food," which refers to food that is typical of a region or culture [46]. Ethnic foods are often viewed as being particularly effective in satisfying consumers' demands due to their high nutritional value and authentic linkages with the culture of reference [10]. Almansouri et al. [3] explain a similar concept called "heritage food," which covers typical aspects related to agricultural products used in the preparation of food. Ethnic identity is strongly related to ethnic foods and reflects retention of the behaviors and attitudes of the culture of origin of the food consumed [24]. Thus, there is a strong relationship between ethnic identity and ethnic food consumption [40, 46]. The development of Peruvian cuisine has resulted in valuing of the biological and cultural diversity [5], as the cultural food practices are integral to the ethnic identities. In particular, social interactions around food are fundamental in the construction of a person's ethnic identity [38].

Research on the TPB has made considerable progress since the theory was introduced more than two decades ago [2]. One of the main assumptions of the TPB is that people are rational in their decision-making processes and actions, so that cognitive approaches can be used to predict behaviors [2, 26]. The theory assumes that the likelihood of a certain behavior is a function of the individual's conscious intention to perform it, which in turn is assumed to be a weighted average of three conceptually independent variables: (a) attitude toward the behavior, which is determined by beliefs about its outcomes and evaluations; (b) subjective norms, which are determined by beliefs about the expectations of others and the motivation to comply; and (c) perceived behavioral control, which is determined by self-efficacy and beliefs about the controllability of facilitating and inhibitory factors [1, 2, 6]. Attitude toward behavior entails a consideration of the outcomes of performing that behavior, while subjective or social norms refer to the perceived social pressure to perform or not perform the behavior [2]. Finally, behavioral control is assumed to reflect past experiences and anticipated difficulties or facilitating conditions [45]. The TPB became one of the most frequently referenced and influential models for the prediction of human social behavior and most critics accept the theory's basic reasoned action assumptions; however, there is some debate about its suitability due to its limiting conditions [11], such as the explanation of human social behavior [2]. Despite this debate, the TPB is one of the most commonly used models in research related to human behavior in the food area.

Different factors beyond sensorial characteristics also affect consumer food choices, and the identification of these determinants would provide a better understanding of dietary behavior [9]. Research has been undertaken on other credence goods and associated theories, for instance, attitudes toward healthy eating and purchasing organic products [6, 26, 27], fish consumption [31, 44], or purchasing IP-certified beans [42]. As Ajzen [2 p199] mentioned, the TPB is open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been considered. Therefore, there is a need to extend theories such as the Theory of Planned Behavior (TPB), which is an attitude–behavior model that researchers have used to assess eating patterns [6, 26]. As far as we know, ethnic identity has not been considered a factor in consumer behavior related to Peruvian quinoa. To address this gap in the literature, the objective of this study is to determine the relationship between ethnic identity and other Theory of Planned Behavior (TPB) factors on quinoa consumption intention and frequency of consumers in Top Lima and Modern Metropolitan Lima, Peru. Consequently, the following twofold hypothesis were formulated:

H1   There is a relationship between ethnic identity and quinoa consumption intention and frequency of consumers in Top Lima and Modern Metropolitan Lima, Peru.

H2   There is a relationship between certain TPB factors and intention and frequency of quinoa consumption of consumers in Top Lima and Modern Metropolitan Lima, Peru.

Data and methods

Primary data were collected through a survey carried out between April and September 2017 near biostores and supermarkets located in Top Lima and Modern

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Metropolitan Lima [20] (Fig. 1). Top Lima and Modern Metropolitan Lima are in the west zone of Lima [20–22], which is on the Peruvian coast. The districts that comprise this area are Barranco, Jesús María, La Molina, Lima, Magdalena del Mar, Miraflores, Pueblo Libre, San Borja, San Isidro, San Miguel, Santiago de Surco, and Surquillo [22]. This area contains 12.9% of the population of Lima, and on average this group has the highest levels of education and income in the city [21]. These people tend to consume higher levels of quinoa and are also willing to buy more expensive products to maintain a healthy lifestyle [32]. There were 381 adult respondents between 18 and 85 years old (comprising 113 males and 268 females) in the survey sample who were approached randomly.

A high proportion of women were interviewed because in many households in Lima, they oversee the purchasing of food items for their families. Most of the respondents are highly educated, they are single but they are not living alone, and they have two children or less (Table 1).

A structural equation model was specified to operationalize and test the causal links posited by the proposed TBP theoretical model. This instrument was designed to provide a multidimensional measure of motives related to food choice, including ethnic identity, health, familiarity or past experience, attitudes, and subjective norms. The three constructs retained from the TPB framework were attitudes, subjective norms, and past experience [31]. Our model included a health construct as it had the potential to explain a substantial amount of variance in the quinoa purchasing intention [31, 44]. Items on motivations affecting quinoa consumption were drawn from Verbeke and Vackier [44] and Mitterer-Daltoé et al. [31], and for the ethnic identity construct in this study, the Multigroup Ethnic Identity Measure (MEIM) item from Phinney [35] was used (Table 2). Roberts et al. [38] used this scale developed by Phinney [35] in their factor analysis of a large sample of migrant teen members of ethnic minority groups.

The survey consisted of questions based on the TPB about motivational factors for quinoa consumption, and they were measured on five-point Likert scales from 1 ("Totally disagree") to 5 ("Totally agree"). All items in the TPB questionnaire were recorded in the same direction; hence, a high score meant a positive attitude, subjective norm, or past experience [31].
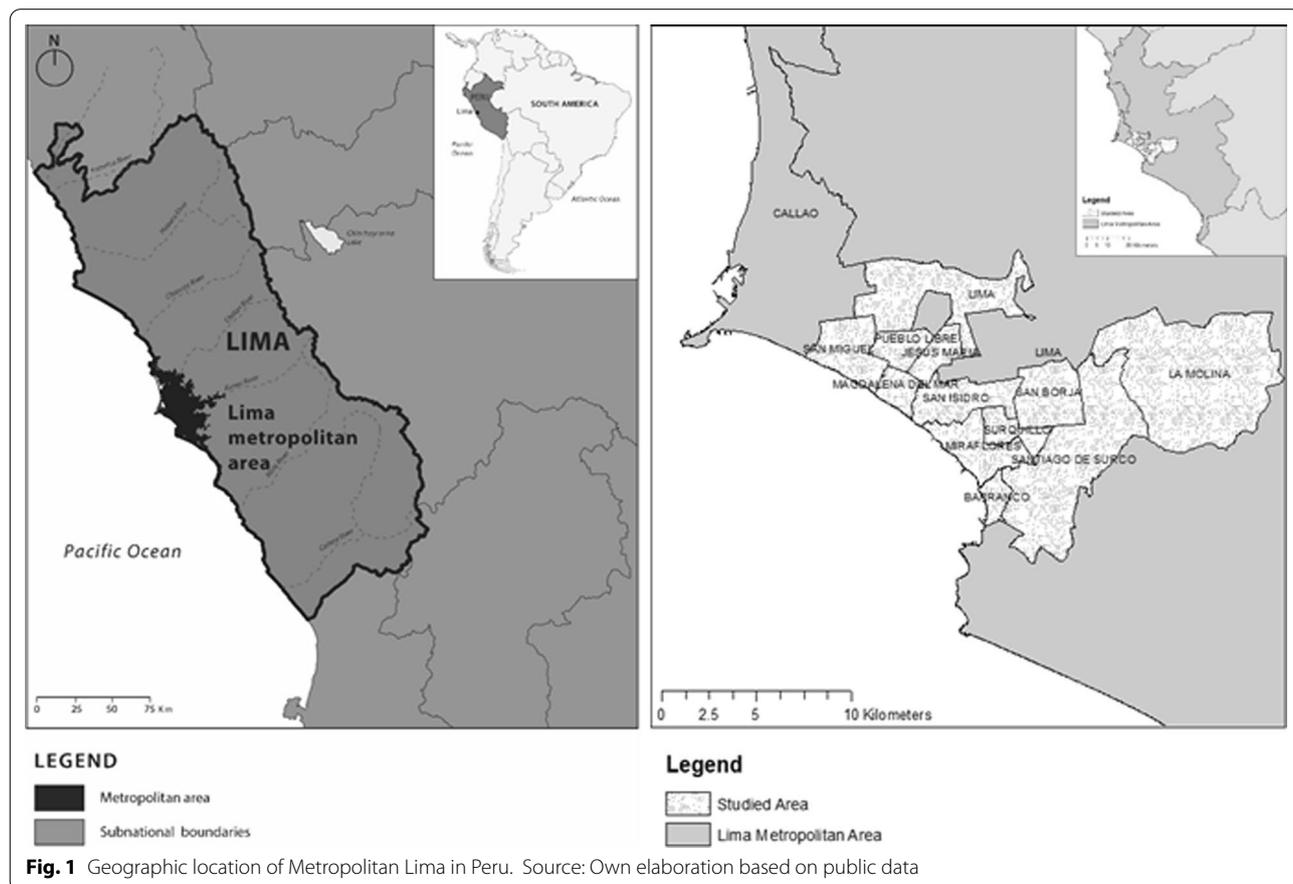

Fig. 1 Geographic location of Metropolitan Lima in Peru. Source: Own elaboration based on public data

Table 1 Sociodemographic characteristics of the sample respondents

Sociodemographic characteristic	N (n = 381)	%
Gender		
Women	268	70
Men	113	30
Marital status		
Single	224	59
Married/cohabiting	135	35
Divorced/Widowed	22	6
Single Household		
Lives alone	36	9
Not alone	345	91
Highest educational level		
Finished primary school	12	3
Finished secondary school	30	8
Technical education	54	14
Incomplete university	95	25
Finished university	160	42
Masters/PhD	30	8
Years of studies		
6–10 years	12	3
11–15 years	169	44
16–20 years	199	52
21–25 years	1	0
Age		
15–30 years old	185	49
31–46 years old	78	20
47–62 years old	90	24
63–78 years old	24	6
79 + years old	4	1
Family members		
1–3 members	182	48
4–6 members	177	46
7–9 members	18	5
10–12 members	4	1
Number of children		
0–2 children	319	84
3–5 children	55	14
6–8 children	7	2

Source: Own elaboration based on primary data

The items used were obtained from the relevant literature, as described in Table 2. The reliability of the TPB constructs was tested using the Cronbach's alpha coefficient. Lockie et al. [27] and Steptoe et al. [43] note that while the scales have high internal reliability, there are also strong enough correlations between a few of the scales to suggest that collapsing them into a smaller number of factors may be appropriate. Thus, a confirmatory factor analysis (CFA) was performed first, followed by structural equation modeling (SEM) with the diagonally weighted least squares (DWLS) method. The DWLS method was used because of the small size of the obtained sample and the violation of the normality assumption by the data. This estimator, for which the polychoric or polyserial correlation matrix serves as the basis for analysis, is a compromise between the unweighted least squares method and the full weighted least squares method [14]. These analyses were performed using lavaan R package for structural equation modeling.

Finally, this model was specified with a dichotomous dependent variable that represented the final choice of quinoa in terms of consumption frequency. Sociodemographic characteristics were used as control variables on the Peruvian frequency of quinoa consumption by means of a binary logit model where the dependent variable was the quinoa consumption frequency [32] variable. The quinoa consumption frequency takes values of 1 for "daily to weekly" consumption and 0 for "fortnightly to monthly."

Results and discussion

Consumption frequency is first explained by a set of sociodemographic determinants [33] as specified in Table 3. The interviewees reported different frequencies of quinoa consumption, with 9% consuming quinoa daily, 16% consuming quinoa three times per week, 41% consuming quinoa less than three times per week, 19% consuming quinoa twice a month, 9% consuming quinoa once a month, and 5% who did not indicate the frequency of consumption.

In this case, it was expected that education would be reasonably homogeneous within the small residential areas and that it would have a positive effect on quinoa consumption [32]. Nevertheless, all socioeconomic variables were not significant (Table 4). R-squared was 1%, and none of the socioeconomic variables were significant in the frequency of quinoa consumption at a 10% significance level (Table 4).

To analyze the factors that affect the intention to consume quinoa, an SEM approach was applied to examine the general fit of the proposed model and to test the hypothesis. First, a CFA was applied (see "Appendix") to assess the measurement model and the SEM analysis was undertaken to review the general relationships among the constructs [43].

Overall, the model fit and measurement model fit assessments were considered in the model fit examination (Table 5). The chi-square statistic is high and significant (348.67; d.f. 172; *p*-value = 0.00). Considering that the implied null hypothesis of the SEM is that the observed sample and SEM estimated covariance

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Table 2 Constructs and items used in the model and Cronbach's alpha coefficient (*a*)

Dimension	Items	Definition	Previous studies
Subjective norms (*a* = 0.78)	SN1: I buy quinoa to give my family a nutritious meal	Social pressure perceived by an individual to show a specific behavior	Verbeke and Vackier [44]
	SN2: I buy quinoa to give my family a healthy meal		
	SN3: Doctors and nutritionists think I should eat/buy quinoa		
Attitude (*a* = 0.86)	A1: It is reliable to eat quinoa	Degree in which a person has a favorable or unfavorable evaluation of the behavior	Verbeke and Vackier [44]
	A2: Eating quinoa is wholesome		
	A3: Eating quinoa is nutritious		
	A4: Eating quinoa is safe		
Past experience (*a* = 0.78)	PE1: I have a lot of experience in buying quinoa	Way of anticipating difficulties or facilitating conditions that influence on the behavior	Verbeke and Vackier [44]
	PE2: I am familiar with quinoa preparation		
	PE3: It is easy to prepare quinoa		
	PE4: I am familiarized with quinoa consumption		
Health (*a* = 0.78)	H1: Eating quinoa stimulates brain development	Inherent role of the diet in the well-being of the person	Carrillo et al. [9]
	H2: Eating quinoa prolongs the years of life		
	H3: Eating quinoa makes me strong		
Intention to eat quinoa (*a* = 0.81)	I1: There's a high probability that I will eat quinoa in the following two weeks	Willingness of people to perform a behavior. To what extent they are planning to make an effort with the aim of performing a behavior	Verbeke and Vackier [44], Ajzen [2]
	I2: I'm planning to eat quinoa in the following two weeks		
	I3: My willingness to eat quinoa is high (I want to eat quinoa)		
Ethnic identity (*a* = 0.70)	EI1: I feel proud that quinoa is Peruvian	Includes ethnic attitudes and a sense of group belonging. The strength and valence of ethnic identity, termed affirmation and belonging, is represented by items that assess attachment, pride, and good feelings about the person's ethnicity	Roberts et al. [38], Phinney [35]
	EI2: I feel proud to be Peruvian		
	EI3: I am interested in the culture of the indigenous people of Peru		

Source: Own elaboration based on primary data

Table 3 Descriptive statistics of sociodemographic variables

Consumption Frequency	1 = Daily to weekly		0 = Fortnightly to monthly		Total	
	Mean/Frequency	S.D./Percent	Mean/Frequency	S.D./Percent	Mean/Frequency	S.D./Percent
Sex (Female = 1)	98	71.01%	170	69.96%	268	70.34%
Civil Status (Married/cohabiting = 1)	52	37.68%	83	34.16%	135	35.43%
Single Household (Lives alone = 1)	17	12.38%	19	7.82%	36	9.45%
Education (years)	14.69	2.36	14.81	2.37	14.77	2.36
Age	38.07	15.94	36.68	15.91	37.19	15.9
Family members	3.67	1.77	3.68	1.73	3.67	1.77
Number of children	1.28	1.45	1.05	1.46	1.13	1.46
N	138		243		381	

Source: Own elaboration based on primary data

matrices are equal, these results are in a different direction. In humanities and social sciences, data that perfectly respect normality are rarely available [14]; thus, additional rates must be verified to support this general impression of the goodness of fit, as the chi-square is sample size sensitive [43].

Table 4 Logit model for sociodemographic characteristics of the Peruvian frequency of quinoa consumption

Variables	Coefficient	Std. Error	Z	Significance
Sex (Female = 1)	0.03	0.24	0.14	N.S
Civil Status (Married/cohabiting = 1)	0.12	0.28	0.42	N.S
Single Household (Lives alone = 1)	0.67	0.42	1.59	N.S
Education (years)	− 0.02	0.05	− 0.48	N.S
Age	0	0.01	− 0.23	N.S
Family members	0.03	0.07	0.36	N.S
Number of children	0.11	0.1	1.07	N.S

Source: Own elaboration based on primary data

Table 5 Model fit summary

Measures	Estimated Model	Acceptable values
Robust χ^2 (d.f., *p*-value)	348.672 (172, *p*-value = 0.00)	***
Robust SRMR	0.046	≤ 0.08
Robust RMSEA	0.031	≤ 0.06
90 Percent confidence interval-lower	0.027	≥ 0.00
90 Percent confidence interval-upper	0.036	≤ 0.162
Robust CFI	0.983	> 0.95
Robust TLI	0.979	> 0.95

Source: Own elaboration based on primary data

The comparative fit index (CFI = 0.95) indicates a discrepancy between the data and the hypothesized model. The Tucker-Lewis index (TLI) shows that values close to 0.95 for large samples are indicative of goodness of fit. In our case, the TLI is 0.943. Moreover, the standardized residual covariance matrix can be used in an ultimate analysis. According to Byrne [8], values less than 2.58 suggest a consistency between the hypothetical values modeled and the data, which matches with the results presented in this study.

Given that the root mean square error of approximation (RMSEA) point estimate is 0.05, the upper bound of the 90% interval is 0.07, the lower bound is 0.04, and the probability value associated with this test of close fit is 0.383; hence, we can conclude that the initially hypothesized model fits the data well [8].

Figure 2 shows the structural model, the hypothesis tests results, and the SEM analysis.

The general structure of the conceptual model supports the TPB theory, as attitude and past experience all had direct effects on the intention to consume quinoa, and this in turn was directly associated with quinoa consumption behavior (Table 6). The positive coefficients indicate a direct relationship between all of these factors and behavioral intention; therefore, the more favorable the factors are, the greater the intention of consumers to consume.

Hsu et al. [17] mention that the country of origin transmits the national identity of a product, which has positive significant effects on product perception and purchase intention. Nonetheless, in our study, the construct "ethnic identity" was independently a negative predictor of the intention to eat quinoa ($p < 0.05$) and consumption frequency ($p < 0.05$). This means that the non-standardized factor loading of ethnic identity, that is -0.26 and -0.08 (both with *p*-value < 0.05), indicates that an increase of one unit in the latent variable is associated with a decrease in the intention of consuming quinoa and also being a non-frequent quinoa consumer (biweekly or monthly). Franco Lucas et al. [13] also showed a significant but negative relationship between the predictor of tradition factor and superfoods consumption. Thus, it can be said that there is a counterintuitive relationship between ethnic identity and quinoa consumption intention and frequency of consumers in Top Lima and Modern Metropolitan Lima.

This result for quinoa consumption with this counterintuitive sign can occur for different reasons. First, the sample we used for this study consisted of members of the urban upper class (primarily upper-class European descendants) [28], whereas ethnic identity and heritage foods like quinoa are particularly associated with highlands food productions, where the culinary heritage reflects a shared memory and origins and support
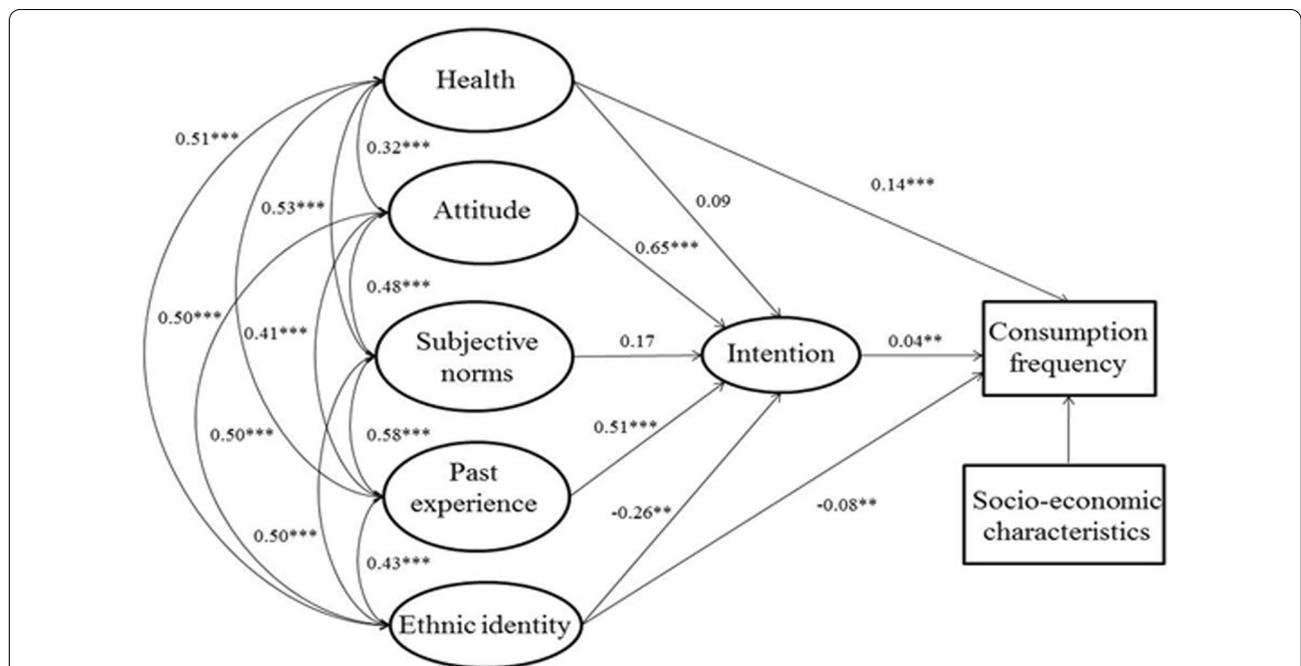
Fig. 2 TPB applied to quinoa consumption in top Lima and Modern Metropolitan Lima. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$. Chi-square test of model fit p-value $= 0.00$

a feeling of belonging to a territory [3]. Even though the main consumer attribute is associated with quinoa's nutritional properties [15], consumers in Lima, which is located in the coastal region, mentioned that they do not consume quinoa frequently [7] due to the high price, the increasing number of health-conscious consumers [23], and because they do not know how to prepare it [16].

Second, the sentiment of pride in Peruvian traditional products began in 2011 with Marca Perú [25], was reinforced in 2013 by the IYQ, and has been enhanced by the Peruvian gastronomic boom [5]. Peruvian chefs know that gastronomic motivations and the culinary experience of tourists play a fundamental role in tourist behavior [19, 39]. Gastronomy in Lima was initially elitist and progressively became a top-down phenomenon [28], with the valorization of Peruvian food gradually being internalized by this elite, who gathered ingredients for their daily food "from low social classes" that required limited preparation techniques. This re-appropriation of Andean products such as quinoa was achieved first by minimizing the modest origin of this grain and the lower-class "Indianness" characteristics, then identifying the desirable or positive attributes and adapting them to the suit the taste of the urban elite [28]. This process of making quinoa part of the daily food habits is different from the way the indigenous local people acquire their food

Table 6 Structural model and hypothesis testing

Variable	Estimate	S.E	*z*-value	*p*-value
Intention <--- Health	0.09	0.13	0.68	n.s
Intention <--- Attitude	0.65	0.15	4.29	***
Intention <--- Subjective norms	0.17	0.14	0.19	n.s
Intention <--- Past experience	0.51	0.14	3.68	***
Intention <--- Ethnic identity	− 0.26	0.12	− 2.19	**
Consumption frequency <--- Health	0.14	0.04	4.05	***
Consumption frequency <--- Ethnic identity	− 0.08	0.04	− 1.98	**
Consumption frequency <--- Intention	0.04	0.02	2.05	**

n.s. not significant; ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$

Source: Own elaboration based on primary data

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habits, as they grow up with this traditional ingredient being part of their daily food [28].

Finally, the reason these consumers who are very proud of being Peruvian have a low intention and consumption of quinoa is the public's preference for eating tasty food such as ceviche (raw fish "cooked" with lime juice), which is the Peruvian national dish, chifa (Chinese-Peruvian cuisine), anticuchos (grilled beef heart pieces on a skewer), or grilled chicken [5], which are considered to be more palatable than quinoa dishes. All of these dishes are consumed in restaurants (or street stalls for lower classes). Reddy and van Dam [36] mention that there is a difference between regular cooking practices and tastier dishes with ingredients for special occasions or celebrations where social interactions around food can be experienced.

There is a relationship between certain TPB factors and intention and frequency of quinoa consumption of consumers in Top Lima and Modern Metropolitan Lima. In the survey, health considerations had no significant effect on the intention of purchasing quinoa ($p > 0.10$), which shows that respondents did not seem to be interested in their well-being when considering eating this grain. A similar non-significant relationship was found between health and Brazilian fish consumption [31]. However, the construct "health" was a predictor of regular consumption (daily to weekly) ($p < 0.01$). Product healthiness and wholesomeness is one of the key consumer perceptions, especially in the case of a functional food like quinoa that contains a high level of essential amino acids [7], which increases the probability of consumption [15]. Consumers who know that quinoa is a nutritious cereal have a healthy home-consumption food pattern, which results in more frequent quinoa consumption. This finding is supported by Franco Lucas et al. [13], who observed that consumers who understand nutritional properties increase their consumption of superfoods. Additionally, Reddy and van Dam [36] found that Singaporeans adopt foreign-based culinary patterns over their native cultural food habits when these are influenced by health factors.

The latent variable of attitude had the highest coefficient (0.65) and a positive impact on the intention to consume quinoa. Consumers of this superfood have very favorable attitudes toward the grain, and their beliefs strongly influence their choices. Morales and Higuchi [32] also found that a positive sensory appeal has an increasing effect on expenditure on quinoa. On the other hand, the subjective norms construct did not have any significant effect on the intention to consume quinoa ($p > 0.10$). Past experience was the construct with the second highest coefficient (0.51) related to the intention to consume quinoa.

Conclusions

This research provides important insights into the application of the TPB to the context of Peruvian quinoa intake. It can be confirmed that there is a counterintuitive relationship between ethnic identity and quinoa consumption intention and frequency of consumers in Top Lima and Modern Metropolitan Lima, Peru. This result is associated with the recent valorization of Peruvian food that has been progressively internalized in the upper class of Lima. Additionally, there is a relationship between certain TPB factors and intention and frequency of quinoa consumption of consumers in Top Lima and Modern Metropolitan Lima, Peru. The latent variable of health was significant for the frequency of quinoa consumption. Thus, observed consumer knowledge of the nutritional and health properties of the super grain is translated into more frequent quinoa consumption. Finally, the variables attitude and past experience also had significant effects on the intention to purchase quinoa in Top Lima and Modern Metropolitan Lima.

The Peruvian Government could develop campaigns that highlight the valuable contribution of quinoa to a healthy diet, taking advantage of the developing "pride for the Peruvian food." Food marketing campaigns could be advertised through media and events that highlight key information on nutritional content and recipes recommended by nutritionists, doctors, and chefs. In addition, the government could subsidize quinoa for low-income families to allow all citizens to improve their diets and benefit from the nutritional and health properties of quinoa [32]. It is also highly recommended to target young children in public campaigns, such as introducing quinoa in schools and universities as potential and advised meals and making parents aware of the benefits of exposing their children to this functional food during the early stages of childhood. Lastly, the food industry could take the opportunity to develop new products based on quinoa in order to make quinoa production sustainable and profitable by providing a permanent market for this crop.

With regard to the limitations of this study, it is important to highlight that the results of this study are relevant only for consumers interviewed in Top Lima and Modern Metropolitan Lima and cannot be generalized for all Peruvian consumers. We suggest performing similar studies in other sociodemographic segments and other geographical zones to broaden the scope of this research, with the aim of exploring the impacts of cultural identity on consumer behavior.

Appendix: Confirmatory Factor Analysis (CFA)

Latent variables

Factor/ items	Estimate	Std. Err	z-value	P(>|z|)	Std. lat. var	Std. all
Health						
H1	0.73	0.06	12.29	0.00	0.73	0.82
H2	0.69	0.06	12.57	0.00	0.69	0.67
H3	0.65	0.06	11.02	0.00	0.65	0.64
Attitude						
A1	0.65	0.05	13.16	0.00	0.64	0.84
A2	0.57	0.06	9.83	0.00	0.57	0.77
A3	0.61	0.05	11.31	0.00	0.61	0.75
A4	0.57	0.06	9.82	0.00	0.57	0.73
Past experience						
PE1	0.66	0.06	11.74	0.00	0.66	0.66
PE2	0.73	0.05	14.82	0.00	0.73	0.80
PE3	0.61	0.07	9.04	0.00	0.61	0.56
PE4	0.57	0.06	9.00	0.00	0.57	0.55
Subjective norms						
SN1	0.64	0.06	10.15	0.00	0.64	0.63
SN2	0.78	0.06	13.59	0.00	0.78	0.84
SN3	0.66	0.06	11.41	0.00	0.66	0.76
Ethnic identity						
EI1	0.53	0.06	8.97	0.00	0.53	0.55
EI2	0.67	0.06	11.74	0.00	0.67	0.78
EI3	0.54	0.06	9.14	0.00	0.54	0.69
Intention						
I1	0.58	0.05	11.07	0.00	0.82	0.82
I2	0.56	0.05	11.48	0.00	0.80	0.80
I3	0.47	0.05	10.36	0.00	0.67	0.69

Covariances

	Estimate	Std. Err	z-value	P(>|z|)	Std. lat. var	Std. all
Health						
Attitude	0.264	0.058	4.552	0	0.264	0.264
Past experience	0.448	0.056	7.954	0	0.448	0.448
Subjective norms	0.435	0.052	8.283	0	0.435	0.435
Ethnic identity	0.442	0.055	7.967	0	0.442	0.442

	Estimate	Std. Err	z-value	P(>|z|)	Std. lat. var	Std. all
Attitude						
Past experience	0.42	0.055	7.617	0	0.42	0.42
Subjective norms	0.458	0.049	9.292	0	0.458	0.458
Ethnic identity	0.471	0.052	9.075	0	0.471	0.471
PBC						
Subjective norms	0.55	0.05	11.114	0	0.55	0.55
Ethnic identity	0.401	0.06	6.712	0	0.401	0.401
Subjective norms						
Ethnic identity	0.471	0.052	8.985	0	0.471	0.471

Variances

Factor/ items	R-Square	Estimate	Std. Err	z-value	P(>|z|)	Std. lat. var	Std. all
Health		1				1	1
H1	0.67	0.26	0.08	3.3	0	0.26	0.33
H2	0.45	0.57	0.08	6.78	0	0.57	0.55
H3	0.41	0.6	0.08	7.53	0	0.6	0.59
Attitude		1				1	1
A1	0.71	0.17	0.04	4.24	0	0.17	0.29
A2	0.6	0.22	0.03	6.71	0	0.22	0.4
A3	0.57	0.28	0.05	5.25	0	0.28	0.43
A4	0.54	0.28	0.05	5.44	0	0.28	0.46
Past experience		1				1	1
PE1	0.44	0.56	0.07	7.91	0	0.56	0.56
PE2	0.64	0.3	0.05	5.78	0	0.3	0.36
PE3	0.31	0.82	0.08	10.55	0	0.82	0.69
PE4	0.3	0.74	0.08	9.46	0	0.74	0.7
Subjective norms		1				1	1
SN1	0.39	0.64	0.07	9.86	0	0.64	0.61
SN2	0.7	0.26	0.06	4.37	0	0.26	0.3
SN3	0.58	0.32	0.05	6.4	0	0.32	0.42

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Factor/items	R-Square	Estimate	Std. Err	z-value	P(>|z|)	Std. lat. var	Std. all
Ethnic identity		1				1	1
EI1	0.3	0.65	0.07	9.37	0	0.65	0.7
EI2	0.61	0.28	0.07	4.31	0	0.28	0.39
EI3	0.48	0.32	0.07	4.85	0	0.32	0.53
Intention	0.51	1				0.5	0.5
I1	0.67	0.33	0.07	4.81	0	0.33	0.33
I2	0.64	0.35	0.07	5.37	0	0.35	0.36
I3	0.47	0.5	0.06	8.81	0	0.5	0.53
Consumption frequency	0.1	0.21	0.01	22.07	0	0.21	0.91

Author contributions

Higuchi designed the research, interpreted the results, triangulated the data, and provided the qualitative and quantitative descriptions. Morales and Sánchez interpreted the results and contributed to the literature review of the theoretical framework and the discussion from the economics and sociological fields, respectively. Maehara depurated the data and conducted the analysis in R software. All authors contributed to critical revisions and read and approved the final manuscript.

Availability of data and materials

The dataset used in the paper was presented conjointly with the paper submission.

Declarations

Competing interests

All contributing authors declare no conflicts of interest.

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