Mapping the Landscape of Natural Food Consumption Barriers: A Bibliometric Analysis of Academic Publications

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ABSTRACT

In recent decades, the number of scientific publications on natural food consumption has increased significantly, and part of this work addressed the phenomenon of customer resistance to natural foods. Despite these studies having broad implications for understanding the mechanisms of barriers to natural food consumption, they have produced fragmented streams of knowledge. Therefore, this paper seeks to conduct a comprehensive review by using a bibliometric analysis approach to assess the historical development and design future agenda for upcoming research in this field. Consequently, 155 Scopus publications from 1989 to 2023 were included based on the inclusion criteria. Furthermore, the analysis tools (e.g., VOSviewer and Harzing's Publish or Perish apps) are used in analysis phase to visualize the conceptual framework of the study. The findings unveil the publications' production related to the impact of consumption barriers in the natural food context is still in its early stages. In addition, the main gaps (i.e., number of publications, research design, and contextual gaps) in the published literature are identified. The findings offer several meaningful insights for scholars and marketers in the natural food setting.

1. INTRODUCTION

Recent decades have witnessed a growing rate of individuals' consumption unprecedentedly which in turn significantly contributed to the exacerbation of ecological problems, as unsustainable consumption accounted for 30-40% of environmental crises [1]. Since environmental degradation and its consequences are a global concern, international institutions like United Nations called for sustainable consumption and production to safeguard the environment (Goal No.12) [2]. Consequently, scholars have paid much attention to promote environmental behaviours through encouraging individuals to switch to consuming green products instead of conventional products in order to support sustainability goals [3].

Natural food, a common example of green and sustainable products, has gained importance because of its benefits for both humans and environment [4]. Despite the significant benefits of natural food, the growth rate of natural food demand is not the same in all countries [5]. In this vein, the value of the natural food market reached around $ 129 billion in 2020 [5]. An accelerated growth of the natural food market is attributed to consumers in developed nations consumed more than developing markets, such as USA, Germany, France, and Canada shared around 68% of global retail sales [5].

Admittedly, the limited purchase of natural food has posed significant challenges to the market and producers [6]. Extensive research has reported that consumers decreased their purchasing because of one or more barriers related to natural food [7]. Such barriers, high price of natural food [8] and lack of availability [9]. These obstacles played significant role in inhibiting consumers' intention and behavior to buy natural food [10]. Empirically, high prices and unavailability are negatively associated with consumers' purchase intentions [10, 11].

Although published literature has explored how buying natural food decisions are critically influenced by related barriers [3, 12-15], these studies provided fragmented knowledge in this discipline. Moreover, Kushwah et al. [16] recommended to conduct quantitative studies, such as bibliometric analysis in the context of organic food-related barriers. Yet, there are still no scientific attempts to provide a comprehensive overview using a bibliometric approach. Given the above-mentioned gap, this paper aims to apply bibliometric techniques to assess the current state of published studies in this area. Thus, we believe that our study may be helpful in shedding light on what is going on with the literature interested in natural food consumption to provide useful insights for scholars and also practitioners. The following research questions are therefore:

RQ1: What historical developments are there in published studies on resistance to natural food consumption?
RQ2: Who are the significant contributors (authors, institutions, and countries) in the published literature in this area?

RQ3: What are the most influential studies regarding resistance to consumption of natural food?

RQ4: What are the central themes that were addressed in this area?

RQ5: What future research opportunities are there in natural food consumption?

2. LITERATURE REVIEW

Natural foods are the type of products produced according to organic farming standards [17]. Natural food is characterized by the fact that it has an environmentally friendly and health-promoting effect due to its natural content. It is therefore produced without chemicals and artificial materials. On the other hand, certain inhibitors have been associated with natural food consumption such as other green products (e.g., high price) [3]. These barriers played a significant role in inhibiting consumer intention and behaviour to buy this type of product [10]. Consequently, scholars were inclined to carry out studies in this field, resulting in the provision of valuable bibliometric data.

Bibliometric analysis approach is a quantitative methodology that incorporates bibliometric data to reveal literature trends [18]. According to Wallin [19], this approach has been widely applied in management, business, social sciences, and economics fields. In this regard, Aria and Cuccurullo [20] referred to bibliometric approach is suitable for scientific mapping in a certain field. Thus, bibliometric analysis approach helps to highlight emerging directions to provide researchers with useful insights regarding productivity, contributors, and the impact of research in particular areas [19]. Moreover, the availability of analysis tools (e.g., VOSviewer)

and databases (e.g., Scopus) led to the popularity of this technique among researchers [21].

Recently, numerous bibliometric reviews regarding natural and organic food consumption are performed as displayed in Table 1. Upon probing the past bibliometric publications, several gaps are observed, which in turn provides significant opportunities for more elaboration. Firstly, previous bibliometric analyzes have focused primarily on documenting previous studies on organic food consumption in general for example [22-24]. Secondly, the previous bibliometric reviews covered short periods such as the study [24-26], which may result in limited consideration of the main factors associated with organic food consumption in their study. Third, some studies focus on specific regions such as developing nations [27-29]. Additionally, Azizan et al. [24] were interested in only including empirical studies in their work.

To address those gaps, the present bibliometric review conducted an analysis for published literature interested in customer barriers to natural food. In addition, our analysis includes various types of documents from around the world. Based on the time coverage, our study covers the long period from 1989 to 2023. The main reason for choosing this time span (1989-2023) is that the barrier concept was supported by innovations resistance theory (IRT) [30]. The IRT model was developed by Ram and Sheth [30] to understand the role of barriers in the context of new innovations such as natural food products. Thus, the novelty of our bibliometric review is that it provides full streams of knowledge of the barriers to natural food consumption by identifying the gap in past literature to assist upcoming researchers in producing more knowledge. This requires adopting various methods to evaluate the contribution of sciences (subject area) and the collaboration among authors, institutions, and countries in this domain.

Table 1. Summary of past bibliometric studies

Author(s)	Objective	Indicators	TDE
Kristia et al. [23]	To evaluate the historical of sustainable food consumption related research.	Annual production, geographical analysis, keyword analysis, top cited documents, co-citation analysis, thematic evolution, country and author collaboration	2265
Cramarenco et al. [25]	To identify published articles that addressed organic food consumption during Corona Vires period.	core journals, top sited paper, co-dependences analysis, keywords co-occurrence analysis, types of research	98
Azizan et al. [24]	To review scientific research in organic food filed.	Yearly publication, author's production, geographical analysis, highly cited paper and cluster analysis	82
Nagy et al. [26]	To review credibility variables of organic food based on articles selected.	Co-word analysis, co-authorship analysis and yearly publication	55
Öğretmenoğlu et al. [27]	To explore the publications of British Food Journal in the Food filed.	Number of publications, highly-cited documents, productive authors, organizations and countries, co-citation of authors, co-authorship and co-occurrence analysis	1892
Painuly and Pachaury [28]	To examined the scientific production in the organic food products area.	Relevant journals, citation analysis, highest publication (countries, affiliations and authors) and co-occurrence analysis	140
Muñoz-Sánchez and Pérez-Flores [22]	To evaluate publications regarded ecological values and organic food.	Citations analysis, yearly publication, top cited articles and main journals, institute and authors	93
Li et al. [29]	To do a bibliometric study focusing on the willingness to pay more for organic food among Chinese.	Highly cited keywords	10

Note: TDE=Total documents examined

3. METHODOLOGY

Search Strategy: There are different steps to conduct the bibliometric review study, but the basic steps are the same. The following from Linnenluecke et al. [31] suggested steps are applied to perform our study. 1) Literature identification,2) Scanning and cleaning outcomes based on the selection criteria, 3) Analysis, 4) Present and write results. Our search began on March 5, 2024 in the Scopus database. Scopus database was selected based on these criteria: 1) It is one of the indexed and abstract databases of peer-reviewed studies [32]. 2) Its ability to sort and classify the search outputs by affiliations, subject area, source types, and other indicators, marking it as a suitable choice for conducting a bibliometric analysis approach [33]. 3) Its extensive coverage of research documents in green production and consumption disciplines such as green food [34].

For the literature identification phase, a combination of keywords regarding resistance to natural food consumption was used in the article title, keywords, and abstract icon to find the relevant studies. Based on the following query [TITLE-ABS-KEY (("organic food" OR "natural food" OR "green food" OR "sustainable food") AND (barriers OR resistance OR inhibitors OR "reasons against"))], the 1,486 documents were produced from 1949 to 2023. Based on the time distribution of these documents, 15 documents (1949-1988), 22 documents (1989-2000), and 1449 documents (2001-2023) were published. After that, the inclusion criteria (English documents published between 1989 and 2023 related to the customer aspect were applied to ensure the analysis focused on the original documents. Figure 1 below illustrates the research protocol.
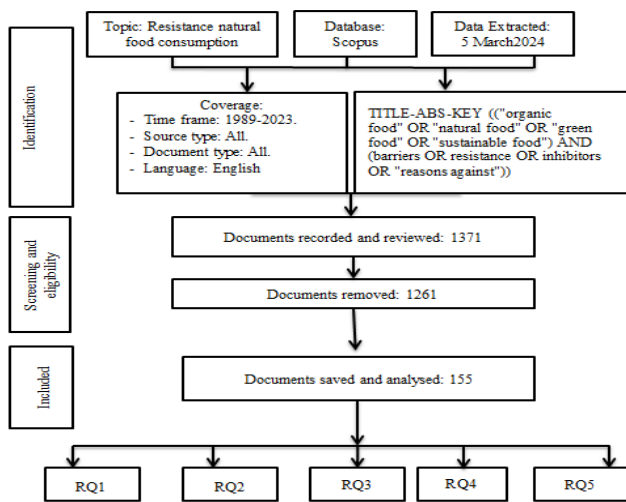

Figure 1. Research protocol
Source: Moher et al. [35]
Note: RQ=Research question

Data Cleaning: This phase aims to include the documents that meet the inclusion criteria and exclude the irrelevant documents. The first inclusion criterion is the time coverage (include past literature that were published between 1989 to 2023). The main reason for covering this period is innovation resistance theory as a theoretical basis was developed by Ram and Sheth in 1989 to support the concept of barriers in the context of new products [30]. Thus, 15 documents were published before 1989 are excluded, and the 1471 documents are included for the next stage. The second inclusion criterion

is literature published in English, because English is the primary language of science and publishing, and the inclusion of multiple languages, particularly when researchers are not proficient in these languages, poses challenges in achieving accuracy and quality in bibliometric studies [20].

Consequently, our analysis does not include 100 studies since they were written in languages other than English. That is, 1371 documents are used for the next criterion stage. The titles, abstracts and keywords of the 1371 published documents in English from 1989 to 2030 were individually and manually scanned to identify published documents related to the customer aspect. Out of 1,371 documents, 1216 articles concerned the production side of green and organic foods and 155 articles concerned the customer side and consumption. Our study focuses on the consumer side because green food supply is driven by demand [13]. Therefore, customers are the most important driver for encouraging the green food market and producers.

To this end, a pool of 155 scientific publications have been exported into various formats (i.e., Bib, ris and Csv) to apply our analysis employing Microsoft Excel, VOSviewer app [36] and Harzing's Publish or Perish app [37].

Data analysis: Responding for our research questions, the 155 documents are analyzed using different indicators. For instance, document and source types, subject area, citation metrics and yearly publications were used to evaluate historical developments of publications in aforementioned field. These indicators were quantified based on Scopus database outputs. Scopus database can classify the search outputs by subject area, source types, and document types [33]. Moreover, total number of publications (TP), number of cited publications (NCP), total citations (TC), average citations per publication (C/P), average citations per cited publication (C/CP), h-index (h) and g-index (g) were employed to determine the significant contributors (authors, institutions, and countries) and highly cited articles. Finally, co-occurrence analysis of keywords was used to gain valuable insights about the clusters of subdomains related topic.

4. RESULTS AND DISCUSSION

The present section aims to illustrate and discuss the key findings on the current state of literature, significant players, influential studies, and the main gaps in the published literature concerning customer resistance to natural food as presented below.

Evaluate the exist state of research interest in resistance to natural food consumption: The following tables encompass descriptive information about the bibliometric data published in Scopus. As illustrated in Table 2, there are five types of documents: Out of 155 documents, articles accounting for (137; 88.39%), followed by book chapters and review papers at the same level (7; 4.51%). Conference papers and notes were forming less than (3%) of publications.

Table 2. Document types

Document Types	TP	%
Articles	137	88.39
Book Chapters	7	4.51
Review	7	4.51
Conference Paper	3	1.94
Note	1	0.65
Total	155	100.00

Note: TP=Total publication

Table 3. Document types

Source Types	TP	%
Journals	142	91.61
Books	6	3.87
Book Series	4	2.58
Conference Proceeding	3	1.94
Total	155	100.00

Based on Table 3, amongst the four source types, journals were the most sources of publications. It accounted for (91.61%) of publications. on the other hand, books, book series and conference proceeding were the least represented with a share of less than (10%). Clearly, articles are the most frequently published documents in this field.

One of the significant functions of Scopus is the classification of search results by subject area. Table 4 shows that agricultural and biological sciences are the broad category; around (43.87%) documents are classified under this subject area, followed by business, management and accounting (33.55%), environmental science (26.45%), social sciences (23.87%) and others such as economics, energy, and nursing. It can be said that the diversity in the subject area in published literature regarding the area of resistance to natural food consumption refers to the publications in this field are not limited as well complex and need more collaboration among scholars to understand the future opportunities and challenges in this discipline.

Next, the citation metrics includes various indicators to show the impact of selected research for the academic community. The citation metrics results were acquired from Harzing's Publish or Perish application [37].

Table 4. Subject area classification

Subject Area	TP	%
Agricultural and Biological Sciences	68	43.87
Business, Management and Accounting	52	33.55
Environmental Science	41	26.45
Social Sciences	37	23.87
Economics, Econometrics and Finance	24	15.48
Energy	24	15.48
Nursing	24	15.48
Engineering	22	14.19
Medicine	17	10.96
Psychology	17	10.96
Computer Science	9	5.81
Immunology and Microbiology	6	3.87
Health Professions	5	3.22
Decision Sciences	3	1.93
Earth and Planetary Sciences	3	1.93
Arts and Humanities	2	1.29
Multidisciplinary	2	1.29
Mathematics	1	0.64

Table 5. Citations metrics

Metrics	Data
Number of papers	155
Number of citations	6166
Years' number	18
Citation / year	342.56
Citation / paper	39.78
Citation / author	2511.09
Papers / author	62.41
Authors / paper	3.42
h	42
g	77
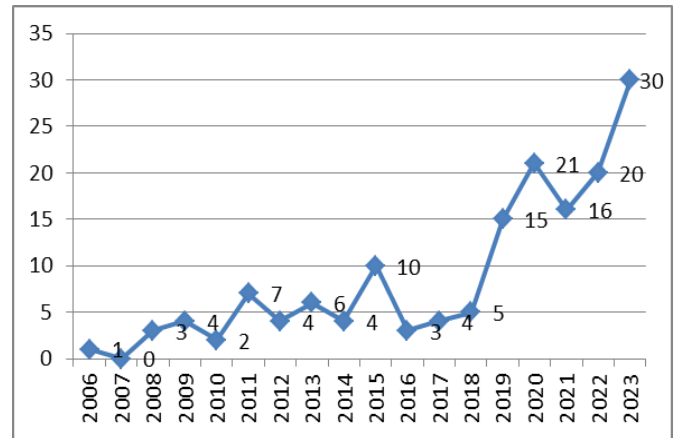
Figure 2. Yearly publications

Based on Table 5, the 155 documents (article, book chapter, review, conference paper and note) were cited Six thousand one hundred and sixty-six times over 18 years, with h index (42), g index (77) and authors per paper (3.42). Based on the value of these indicators, unique opportunities arise for more scientific work to comprehend the significant impact of the key barriers in the context of natural foods.

Figure 2 evaluates the publications trend. Although the total number of publications is 155 documents, the total citation was 6166. It is therefore a testament to research in this area began gaining important attention among researchers. More importantly, our target time coverage is (1989-2023), but the publications related to this area (natural food consumption-related barriers) started in 2006. The expected reason for this issue is that previous studies have paid great attention to the motivating factors of natural food consumption and ignored the role of barriers in minimizing customer intention toward natural foods [13]. In support of this notion, the natural food market has not grown at the expected level in various countries [38], although academics attempt to motivate customers to buy it. Hence, they recently started to address the role of these barriers in the natural food context.

Figure 2 explains the publication distribution of the 155 documents from 2006 to 2023. In this vein, the growth rate of annual publications was divided into two segments, namely the initial and expansion phases. The initial stage was from 2006 to 2018. It started with one document in 2006 and then scientific production reached 10 papers by 2015, after which it declined until 2018. On the other hand, the expansion phase was from 2018 until 2023. During this phase, research production on natural food resistance increased dramatically and reached its highest level in 2023. In conclusion, the academic community has recently recognized the role of inhibitors and their impact on consumer behaviour when purchasing natural foods.

In summary, the findings of the previous analysis revealed that articles and journals provided a broad landscape within different disciplines, for example, agriculture, business, environmental science, social sciences, and other subject areas. Otherwise, publications in the field of customer resistance to natural food are still in their early stages.

Productive contributors in the resistance to natural food consumption area: This section elaborates the important players (authors, institutions, and countries). The authors and institutions publications have been helped these selected countries to hold the leading position in this field as shown below.

Productive authors: Table 6 shows the most prolific authors, they identified based on at least three published documents. Dhir Amandeep from Universitetet i Agder in Norway ranked the first author in term of number of publications (5 papers) all of them were cited (NCP=5), his papers have collected 638 citations as well as (C/P=127.6) and (C/CP=127.6) from 2019 till 2023. Dhir Amandeep's h index and g index were 5. Hamm Ulrich from, Universität Kassel, Germany was the second author and Vega-Zamora Manuela from Universidad de Jaén in Spain ranked third based on total number of publications (4).

Despite Kushwah Shiksha from Netaji Subhas University of Technology in India was ranked eighth in terms of total number of publications (3), his work was cited 490 times. Similarly, Aschemann-Witzel Jessica from Aarhus Universitet in Denmark, he has produced 3 papers and only two of them were cited with 403 citations. This result reflects the important role of Denmark and India for producing research. Besides that, both Dhir Amandeep and Kushwah Shiksha are significant authors who have contributed to this field because of their works in 2019 [13, 16].

Table 6. Top productive authors

Name	Country	Tp	NCP	TC	C/P	C/CP	h	g
Dhir, Amandeep	Norway	5	5	638	127.6	127.6	5	5
Hamm, Ulrich	Germany	4	3	102	25.5	34	3	4
Vega-Zamora, Manuela	Spain	4	4	146	36.5	36.5	3	4
Verbeke, Wim A.J.	Belgium	4	4	416	104	104	4	4
Wojciechowska-Solis, Julia	Poland	4	4	91	22.75	22.75	3	4
Aschemann Witzel, Jessica	Denmark	3	2	403	134.3	201.5	2	3
Denver, Sigrid	Denmark	3	1	54	18	54	1	3
Kushwah, Shiksha	India	3	3	490	163.3	163.3	3	3
Llorens-Marin, Miguel	Spain	3	1	2	0.66	2	1	1

Table 7. The highest productive institutions

| Institution	Country	TP	NCP	TC	C/P	C/CP	h	g
Aarhus Universitet	Denmark	8	7	696	87	99.4	5	8
Københavns Universitet	Denmark	7	4	127	18.1	31.7	4	7
University of Life Sciences in Lublin	Poland		6	101	16.8	16.8	4	6
University of Helsinki	Finland	5	4	670	134	167	4	5
Universität Kassel	Germany	5	4	120	24	30	4	5
North-West University	South Africa	5	5	657	131	131	5	5
Universiteit Gent	Belgium	5	5	433	86.6	86.6	5	5
Warsaw University of Life Sciences	Poland	4	4	235	58.7	58.7	3	4
Siedlce University of Natural Sciences and Humanities	Poland	3	3	59	19.6	19.6	3	3
Wageningen University & Research	Netherlands	3	3	21	7	7	3	2
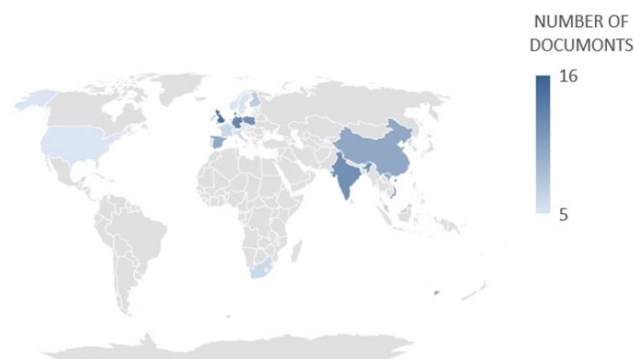
Figure 3. Global publication

Productive institutions: Table 7 displays the highlighted prolific institutions based on the production of at least 3 documents. According to total number of publications, Aarhus Universitet in Denmark has had the highest position (TP=8), followed by Københavns Universitet in Denmark (7), University of Life Sciences in Lublin (6). The University of Helsinki, Universität Kassel, North-West University and Universiteit Gent produced the same number of publications (TP=5). From the perspective of citations, Aarhus Universitet, Denmark ranked the first Institution with the total citations (696), followed University of Helsinki in Finland (670) and Universiteit Gent in Belgium (433). Besides that, Aarhus Universitet has first position according to h-index and g-index. Clearly, the educational institutions in Denmark played a voluble role in this research field.

Productive countries: Figure 3 illustrates the global distributions with at least 5 documents published during the coverage time. According to Figure 3, Denmark has had the first position in terms of the number of published papers (TP=16), 15 of these documents were published by only two institutions located in Denmark, While United Kingdom has a second rank relying on the contribution of 59 authors who produced 15 documents. Germany is considered one these leading nations with 13 publications. Close behind, India and Poland have the same position; each of them published 12 documents by their authors and institutions. They followed by Australia, China, Vietnam, Finland, Malaysia, and other leading countries. Notably, the scientific production of developed nations contributed more than developing countries to the research in this field. This supports why the growth rate of green food market in developed countries is higher than in developing nations.

Table 8. Top highly cited articles

Authors (Study)	TC	C/Y
Aertsens et al. [10]	330	25.38
Aschemann-Witzel and Zielke [15]	280	40
Bryła [39]	223	27.88
Roitner-Schobesberger et al. [40]	263	16.44
Tsakiridou et al. [41]	250	15.63
Kushwah et al. [16]	226	45.20
Grunert [42]	214	16.46
Żakowska-Biemans [43]	185	14.23
Pham et al. [3]	181	36.20
Tuorila and Hartmann [44]	164	41
Nguyen et al. [45]	160	32
Brown et al. [46]	148	9.87
Kushwah et al. [13]	146	29.20
Xie et al. [47]	146	16.22
Tandon et al. [12]	129	43

In summary, the prior analysis provides core insights into research community and policy making to identify the main players for impactful studies in terms of authors, institutions, and countries contained in the consumption barriers in the green food context.

Influential studies in the resistance to natural food consumption field: The most frequently cited articles are presented in Table 8. The 15 papers were chosen based on their total citations and citations per year. Despite the significance of the selected papers, the seminal documents are highlighted in terms of value and expected impact on academic society in the future. For examples:

Aertsens et al. [10] paper, referred to high prices and availability of organic vegetables are considered the strongest perceived barriers for customers to purchase such products. This paper obtained the highest citation 330. However, its citation per year was low compared with other works. It therefore reflects the scholars' interest in the role of barriers correlated with organic food purchase decisions. The next work by Kushwah et al. [16] aimed to systematically review 89 empirical studies to highlight the main barriers and motivations in the organic food context. Despite this research paper ranks fifth based on total citations, it is the highest in terms of citations per year 45.20. This highlights the significant impact of this work on scientists interested in studying barriers to organic food consumption.

Furthermore, the work by Kushwah et al. [13] has received (146) citations with an average of (29.20) citations per year. They conducted a qualitative and quantitative study to understand the role of resistance to organic food consumption among Indian consumers. This work obtained its significance because it was the first work to apply the theory of resistance to innovation to understand the real role of barriers to organic food. The empirical study by Bryła [39] ranked sixth based on the total number of citations (223). The aim of his study was to examine the barriers and motivating factors associated with organic food among Polish customers. When it comes to barriers, the price of organic food has emerged as the main reason not to purchase it.

Finally, empirical study by Tandon et al. [12] ranked lowest in term of total citations (129), but ranked second based on citations per year (43). This work applied two robust theories which are the Stimulus-Organism-Response and innovation resistance theory to determine the role of value, usage and risk barriers in the context of organic food consumption. In conclusion, the aforementioned literature published over18 years, provides a valuable contribution to shaping research directions regarding the various barriers in the organic food sector.

Co-occurrence analysis: The determination of central themes that were addressed in the selected published documents requires the delineation of pivotal relationships that underpinned the development of the field of resistance to green food consumption. To achieve this goal, keyword analysis is adopted using VOSviewer app. VOSviewer software is app for structuring and visualizing bibliometric networks to easily understand the main patterns in a given area. The 155 documents within CSV format were exported to the software to perform author keyword co-occurrence analysis.

Ultimately, the author's 515 keywords utilized, with 4 representing the minimum number of occurrences of the keywords. This process generated 25 keywords that met the threshold. In addition, country names (i.e., Poland and Vietnam) are disregarded. The final outcomes are 23 items.

The closeness between keywords provides insights into the strength of relationships among them. Figure 4 visualizes the author's keywords and elaborates the relationships among diverse concepts.
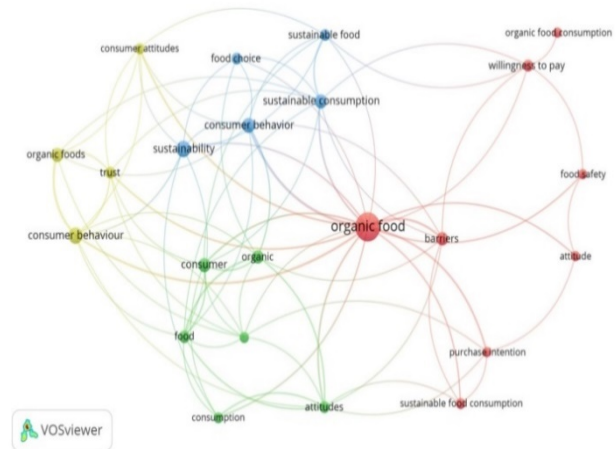

Figure 4. Co-occurrence map

Table 9. Keywords analysis

Keywords	C	L	TLS	O	Theme
Attitude	1	3	4	4	
Barriers	1	7	10	8	
Food safety	1	3	4	4	
Organic food	1	18	46	56	Cluster 1
Organic food consumption	1	1	1	4	red
Purchase intention	1	5	7	4	
Sustainable food consumption	1	4	5	5	
Willingness to pay	1	6	6	6	
Attitudes	2	9	14	6	
Consumer	2	8	12	10	
Consumption	2	5	7	5	Cluster 2
Food	2	9	13	7	green
Organic	2	8	13	8	
Theory of planned behavior	2	9	9	5	
Consumer behaviour	3	9	15	11	
Food choice	3	5	5	6	
Sustainability	3	8	10	13	Cluster 3
Sustainable consumption	3	9	12	10	blue
Sustainable food	3	7	8	6	
Consumer attitudes	4	7	9	5	
Consumer behaviour	4	9	18	13	
Organic foods	4	6	11	9	Cluster 4 yellow
Trust	4	7	11	6	

Note: C=Cluster, L=Link, TLS=Total link strength, O=Occurrences

Table 9 illustrates the cluster analysis to summarize the main themes or clusters discovered in our study. Looking at the details in Table 9, there are 4 clusters within 81 links and 125 link strength. Each cluster is distinguished by a specific color. For instance, the red-colored indicates cluster one. Theme or cluster one involves 8 items such as attitude, barriers, organic food, purchase intention, sustainable food consumption. Organic food and barriers concepts emerged as important themes based on link, total link strength and number of occurrences. It can be said that studies on barriers to organic food consumption were grouped under cluster number one.

Besides that, items (i.e., attitudes, consumer, consumption, food, organic and theory of planned behaviour) belonged to the second red-colored cluster. The second cluster suggested that planned behavior theory has been widely applied in the

literature to understand consumer behavior in the organic food context. The third blue-colored and fourth yellow-colored clusters comprised (5, 4) items respectively. These clusters are related to consumer behavior in the organic food topics. Organic food, barriers, consumer behavior, sustainable consumption and sustainability were clearly seen as the most common occurrences in each cluster.

5. CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

Due to the responsibility of moral consumption towards the environment, the consumption of natural foods has attracted great interest among academic communities and businesses. Therefore, scientists have tried to understand the role of the main reasons against consuming natural foods among individuals in order to increase their consumption. Thus, the present study used bibliometric analysis approach to shed light on the existing state, key players, significant papers, central themes and main gaps in published documents that addressed the barriers to natural food consumption. Hence, the 155 downloaded documents were extracted from the Scopus database as a pool of bibliometric analysis. Furthermore, software applications such as and Harzing's Publish or Perish and VOSviewer were used to analysis phase to visualize the conceptual framework in this field of study.

Significantly, the current study has donated to the extant body of literature in several ways. Firstly, throughout elaborating the types of sources, subject areas, and annual trends in publications output (RQ1). Secondly, identify the prolific authors (Dhir, Amandeep and Kushwah, Shiksha), the academic institutions (Aarhus Universitet), and the leading countries (Denmark and United Kingdom) (RQ2). Thirdly, this present study highlighted the influential studies (RQ3) and also identifying the main themes by co-occurrence analysis (RQ4). Finally, upon probing the selected papers concerning understanding the mechanisms of barriers in the natural and organic food area, the main gaps are (RQ5).

Gaps related to number of publications: The barrier concept has been examined in the context of organic food in various subject areas in order to understand the influence of reasons against consuming organic food. However, the total number of publications is still limited based on the citation metrics results. Therefore, there is a continuing call for much more research to understand the critical role of these barriers to natural and organic food consumption.

Gaps related to research design: Despite previous studies have referred to green behaviour gap phenomenon [48, 49], majority of observed studies have focused mainly on cross-sectional technique. In other words, they focused on understanding the extent to which these barriers affect consumer intention to purchase green food and overlooked the link between intention and actual purchase. Hence, future research should apply longitudinal research to close this gap in the green food context. Besides that, a high number of selected research relied on quantitative methods. Although these types of research methods provide valuable insights regarding testing theories, there is an urgent need for qualitative and mixed-methods. This in turn leading future research to apply qualitative or mixed-methods approach to cover the core foci related to this area.

Contextual gaps: This gap lies in mainstream studies that aim to investigate and understand the mechanisms of barriers

to purchasing green food among consumers in developed countries such as United Kingdom and Germany. Exceptionally, a limited amount of research has been performed in developing nations (i.e., India, Vietnam and Malaysia). Thus, there is a significant need to understand the impact of these barriers in different environments. Future academic studies need to devote considerable attention to examining the role of barriers associated with natural foods among customers in less developed countries where the organic food market is small. Additionally, there are valuable opportunities to conduct cross-cultural studies comparing developed and developing countries in this area.

Gaps related to theory and variables: Notably, one of the key gaps is the planned (TPB) behaviour theory has been extensively applied in selected papers (keywords analysis). Nevertheless, the TPB encountered several limitations and criticisms [50-52]. For Example, the TPB is concerned with motivational mechanisms while neglecting the role of barriers in the formation of behavioral intention. On the other hand, the innovations resistance theory (IRT) was established by Ram and Sheth [30] supported the negative effects of barriers to new products (i.e., organic food). It can be suggested that, future studies could integrate both TPB and IRT to understand consumer resistance behaviour in the natural food context. Finally, previous literature has cited the high price and unavailability of green foods as major barriers to purchasing natural products. In fact, we cannot overclock the roles of these variables, but there need to examine the role of both functional barriers (e.g., usage, value and risk) and psychological barriers (e.g., tradition and image) to explore their effect on customer decisions towards organic food [53].

6. STUDY IMPLICATION AND LIMITATIONS

This current study offers useful theoretical and also practical implications. Theoretically, the findings of study provided a robust foundation for future studies concerned with deep understand consumer behaviour of the natural food. First of all, the main themes in this interested area were identified. Furthermore, by evaluating the current state of published literature, the main gaps were discovered in current studies. It is therefore provided many opportunities for the following researchers to fill it. In line with practical implications, the limited size of natural food market is seen as a major challenge for marketers and producers. Given the increasing urgency for marketers and policymakers to understand the reasons influencing the natural food market, the findings of our study can help them formulate of effective product, place, pricing and promotion strategies. In this sense, understanding the impact of these inhibitors on customers' decision-making will assist them to choose effective strategies that increase customers' trust in the natural food products.

Similar to other studies, our study also has some limitations. First, our analysis was limited to the bibliometric data extracted from the Scopus database. Although Scopus provided a comprehensive literature on our study, it could not cover all available documents. Future research has to incorporate other databases (i.e., Google Scholar and WoS). This could have led to a complementary of views. Second, our analysis was limited to documents published in English; this may have resulted in the relevant documents being neglected. Future studies will therefore include documents published in other languages such as Chinese, German and Spanish to

expand the pool of analysis. Finally, our bibliometric review was limited to literature interested in consumer sides; Future research needs to include studies that cover the production side.

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