

THE SOURCES OF KNOWLEDGE AND THEIR IMPACT ON CONSUMERS' DECISIONS CONCERNING PROPER NUTRITION

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Introduction/background: As a result of ICT development a growing number of consumers use the Internet as a principal source of information on the relationship between good nutrition and health. This in turn provides a basis for taking purchase decisions. The research presented in this paper focuses on the act of selecting sources of consumer information to facilitate the process of purchase decision-making. The literature on this subject consists of extensive reviews on food items but lacks research on proper nutrition.

Aim of the paper: This paper is aimed at analyzing the sources of consumer information on proper nutrition. The research involved identifying the most frequently used sources of consumer knowledge on healthy foods and examining the correlation between the sources selected by respondents and their level of knowledge.

Materials and methods: The research data were obtained by means of online questionnaires sent out to 240 respondents selected using purposive sampling. The study was carried out in the last quarter of 2019. The following statistical methods for data analysis were applied in this study: contingency tables, multiple response tables, the Chi-square test of independence and the Spearman's rank correlation coefficient.

Results and conclusions: The results of the analysis revealed that websites run by experts represent the most popular channel for communicating with consumers, and as invaluable sources of knowledge on healthy eating. The conclusions derived from applied research provide guidelines on marketing communications strategy for healthy food producers.

Keywords: knowledge sharing, consumer information, knowledge management, communication channels, proper nutrition.

1. Introduction

The decision-taking process represents an indispensable element of consumer behavior. The dynamic development of information and communication technologies has led to far-reaching changes in the sources, as well as means of satisfying purchase needs. Consumers have

become more demanding and their needs undergo constant changes. They search for product information using traditional means such as own experiences and commercial messaging, as well as utilizing online resources. The evolution of the Internet had a profound impact on establishing new information sources. Businesses are eager to utilize online marketing communications channels and to apply diverse promotional tools. The process of exchanging opinions among consumers has also been affected by significant changes. Many websites, internet forums and shops provide users with the opportunity to share their opinions with others. The research results indicate that *e-word of mouth* (eWOM) exerts an extremely strong impact on taking purchase decisions, and the opinions expressed by other website users are treated as a reliable source of information (Barlas, Stamboulis, Vleioras, 2020; Budzanowska-Drzewiecka, 2015). Internet users add informal, spontaneous or more structured opinions, however, it should be noted that some persuasive online recommendations are commissioned by commercial enterprises. Neutral blogs and affiliate websites run by experts in a given field, who share their knowledge as well as publish reviews and opinions, represent a special case. This trend is especially noticeable in cosmetic, fitness, dietetic and medical branches. It is popular to seek for medical advice online – in Poland, over 60% of its citizens use the Internet to search for information on health and illnesses (Szymczyk, Grela et al., 2015).

The purpose of this paper is to analyze the sources of information used by consumers to take purchasing decisions on proper nutrition. The authors formulated the following research questions: What are the main sources of consumer knowledge on good nutrition? What is the relationship between the sources of information on proper nutrition and foods selected by consumers and their level of knowledge within that scope?

2. Information sources in the consumer decision-making process

Contemporary consumers take very complicated decisions on a daily basis that concern, among others, the place, time, order and means of making a purchase. The development of the world wide web, internet shopping, price comparison sites and instant messaging marketing targeted at prospective clients has led to changes in the process of taking decisions and factors affecting it. A typical decision-making process consists of the following stages:

1. Identifying/creating a need.
2. Searching for information.
3. Assessing the possibility to satisfy the need.
4. Making a choice (assessing other options).
5. Purchase.
6. Evaluation of the purchase made by using it (Goldsmith, 2005).

In this paper, we draw special attention to the stage involving searching for information. The process of looking for information by consumers has been defined as “the motivated

activation of knowledge in memory or acquisition of information from the environment about the potential satisfiers” (Blackwell, Miniard, & Engel, 2006, p. 126). This means that ‘internal’, that is that resulting from previous experiences, as well as ‘external’ sources, can be used to obtain information. The external process motivated by the necessity to take a purchase decision takes place before or during a purchase. External search motivated by an imminent purchase decision, is considered as pre-purchase search (Schmidt, & Spreng, 1996), while ongoing search consists of “search activities that are independent of specific purchase needs or decisions” (Bloch, Sherrell, & Ridgway, 1986, p. 120). The benefits of such search for consumers include saving money by purchasing the product at a lower price, lessening of risk and increasing the likelihood of obtaining a superior product by eliminating inferior alternatives (Klein, & Ford, 2003), as well as generating greater satisfaction with purchase decision (Punj, & Staelin, 1983). The research presented in this paper is focused on pre-purchase external information search behavior.

The literature of the subject provides multiple research into the process of looking for external sources of purchase information offline (e.g. Kim, & Ratchford, 2012; Punj, & Staelin, 1983;). When it comes to online information sources, researchers focus their attention mostly on the ways of searching for purchase occasion, selecting an information source and evaluating its credibility. In most cases, researchers agree that consumers do not limit their choices to online or offline sources, but use both of these alternately (compare Grant, Clarke, & Kyriazis, 2007; Rippé, Weisfeld-Spolter, Yurova, & Sussan, 2015). Another interesting line of research is concerned with information overload and the impact of that phenomenon on the evaluation and selection of the sources of consumer information (Lu, & Gursoy, 2015).

Budzanowska-Drzewiecka (2015) proposed to divide external information sources into the following categories: informal (provided by consumers sharing opinions with other users), neutral (provided by experts) and commercial (provided by salespeople and intermediaries characterized by a clearly defined commercial purpose). This classification becomes extremely important when we take into account the evaluation of the credibility of the source. According to Bailey (2005), consumer opinions can be found on two types of websites. The first type includes websites that are characterized by frequent interactions that are run by consumers who use mostly non-structured written forms. Such websites include Internet communities, blogs and discussion forums. In the subject literature, these sources are often described with the term *Word of Mouth* (WOM or e-WOM in the case of internet sources). The second one covers marketing-oriented websites that are utilized as an online marketing communications channel, such as Internet rankings, price comparison sites and opinions in Internet shops. Bailey’s classification does not include neutral websites, which constitute an exceptional source of information provided by experts in a given field. These websites – in most cases – blogs and affiliate sites on social networks, are run for information purposes by users with appropriate education or professional experience. It is worth highlighting that in some cases, experts publish promotional materials financed by companies. These channels are also used to interact with

consumers who are given an opportunity to question the experts or add their own opinions and posts.

Figure 1 illustrates determinants that contribute to the influence of informal internet sources of consumer information (eWOM).

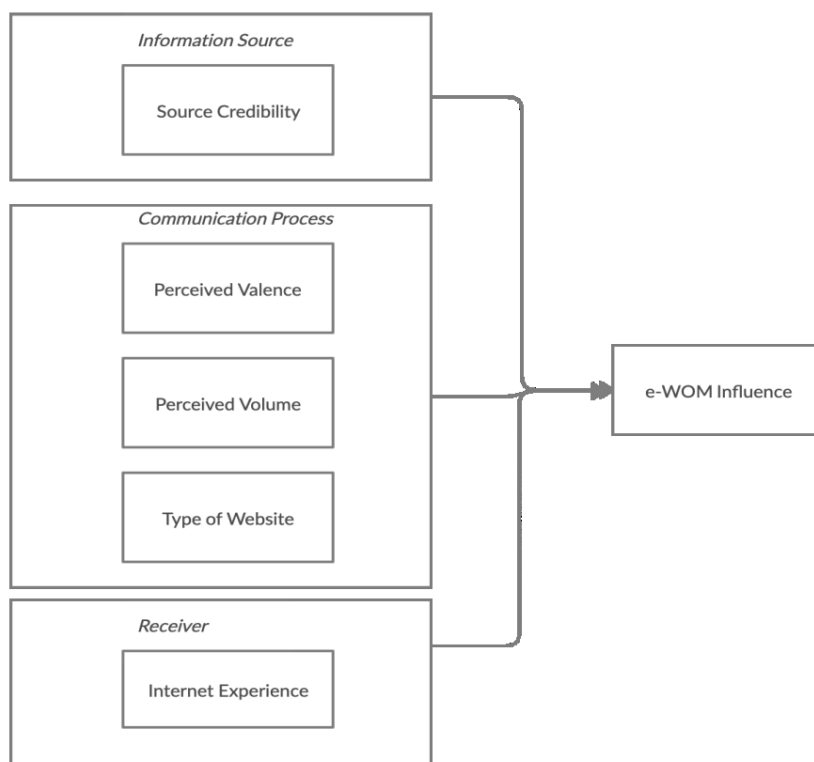


Figure 1. Determinants of eWOM influence. Source: M. López, M. Sicilia, Determinants of E-WOM Influence: The Role of Consumers' Internet Experience, *Journal of Theoretical and Applied Electronic Commerce Research* Vol. 9, Iss. 1, p. 31.

Taking into account the purpose of this research, it is worth treating the evaluation of the information source as a variable that may affect the level of consumers' knowledge. Determination of credibility based on sourcing in the subject literature is called the 'source effect' (Bae, Lee, 2011). This means that the information released by an expert is assessed as being more reliable than the same, but published by the producer.

3. Information behavior with regard to proper nutrition

The Medical Library Association (2013) defines health information literacy as "the set of abilities needed to: recognize a health information need; identify likely information sources and use them to retrieve relevant information; assess the quality of the information and its applicability to a specific situation; and analyze, understand, and use the information to make good health decisions." This definition can surely be applied to information regarding healthy foods and proper nutrition. The level of health information literacy has been extensively studied

by experts in healthcare and nutrition, as well as in information science. This type of research usually involves employing self-administered questionnaire (Niedźwiecka, Słońska, Taran, 2012). The other type of studies covers secondary data analysis, in particular, data concerning means and the scope of searching for information on health and good nutrition. That research may refer to consumers' activity in social media (e.g. Sanak-Kosmowska, Śliwińska, 2020; Sharma, De Choudhury, 2015) or analysis of the inquiries made using search engines (Shepherd, 2005).

Health has become a key factor for many contemporary consumers that affects their eating habits (Goetzke, Spiller, 2014). Health condition and illnesses are often perceived as consequences of the individual's behavior – their eating habits, diet and physical activity. Consumers, so as to improve their health, and frequently on their own initiative, look for information and advice on proper nutrition. The search results in following diets, purchasing eco-friendly and functional foods. Thompson and Moughan (2008) identified the most important trends in nutrition almost a decade ago: individualized nutrition, body weight control and foods affecting mental well-being. Currently, this list should be extended with the following positions: eco-friendly foods (from local farmers) and functional foods (with documented impact on human body). This trend has also been observed in Poland. Indeed, forty percent of all Polish consumers admit that they buy healthy food at least once a week (Portal Spożywczy, 2019). The report titled: *Wiemy co jemy. Polacy o potrzebie informacji* (Eng. *We know what we eat. Polish citizens about the information need*) compiled by the research agency 'Inquiry and ITBC Communication' (2019) details the search by Polish citizens for proper nutrition information. The study involved 551 participants and was conducted in May 2019. According to the report, 91% of all respondents pay attention to food product information. The research population were particularly interested in ingredients – 90% of all participants checked whether given food contains any contaminants. Positive effects of foods on health (83%) and nutrient content (82%) were of equal importance for the research participants. Furthermore, the study indicated that consumers obtain food information mostly from labels. Other important sources of food information listed by respondents included cooking TV shows (32%), family/friends (30%) and the Internet – thematic websites, e.g. about cooking (29%). Moreover, the consumers claimed that advice provided by doctors and dieticians (41%), packaging labels (38%) and family's/friends' recommendations (34%) are the most credible sources of knowledge concerning nutrition. The study also noted that Polish citizens trust websites (27%) and cooking TV shows (25%).

4. Research methodology

The analyses presented in this paper were carried out using the results obtained from own studies conducted in 2019 involving online survey questionnaires distributed among Polish

consumers. We used a purposive sample and took into account respondents' age (two categories: age range 18-34 and 35-65 years) and gender (two categories: female, male). Each subgroup amounted to 60 observations. The sample amounted to 240 respondents. A questionnaire was used as a research tool. Two variables were analyzed to answer research questions: the sources of knowledge used by consumers and their level of knowledge. The successive stage of the analysis involved examining correlations between the two variables.

The respondents were asked about the sources used to obtain information concerning foods and nutrition. Survey participants could select any number of answers from the one given below:

- from scientific literature,
- from classes/courses at school/university,
- from TV/radio,
- from family/friends,
- from experts (e.g. doctor, dietitian),
- from websites run by experts,
- from internet users,
- from other sources/what sources?

The analysis of multiple dichotomies allowed learning about respondents' opinions and presenting the number of observations, percentage of answers and percentage of cases in one table.

Respondents' knowledge with regard to foods and proper nutrition was evaluated based on their own subjective statement. Survey participants could select one of the five following responses determining their level of knowledge:

- very high (I'm an expert in nutrition);
- high (I'm interested in this subject, I read a lot and expand my knowledge);
- average (I expand my knowledge on selected products from time to time);
- low (I'm aware which products are not healthy but I do not look for new information);
- very low (I do not know which products are healthy and I'm not interested in these issues).

The surveyed women and men were divided into five groups based on subjective perception with regard to knowledge in the analyzed field. Due to low number of observations, two marginal categories were merged to enable running the Chi-square test, otherwise basic assumptions of the independence test would not be met. As a result, the number of categories was reduced from five to three:

- category "high level of knowledge" was obtained by merging "very high" and "high" categories,
- category "average level of knowledge" was created from the one with the same name,
- category "low level of knowledge" was obtained by merging "very low" and "low" categories.

The level of knowledge (3 categories) was compared with the information sources selected by survey participants using contingency tables to identify the sources that are the most effective in terms of expanding respondents' knowledge. This paper covers the analysis of results for 3 sources of knowledge that were most frequently selected by survey participants. The data were examined using Chi-square test of independence and the Spearman's rank correlation coefficient. All analyses were carried out using the Statistica software, version 13.1.

5. Results

5.1. Identification of the most frequently selected sources of information concerning proper nutrition

The analysis revealed that websites run by experts represent the most frequently selected source for obtaining information about the impact of nutrition on health. That response was given by half of all respondents. Family and friends took the second position, as 45% of all respondents use their advice. The next popular source of information is represented by TV and radio (38,75% of all cases). This is followed by Internet users (35,42%). The selection of these sources may depend on many factors, among others, user-friendly means of delivering information, widespread and easy availability. One fourth of the surveyed obtain information directly from experts or scientific literature. This shows that respondents wish to acquire reliable knowledge. As the number of responses was not limited, it can be noticed that consumers consider proper nutrition a crucial issue and look for information on this topic in many sources. Based on the analysis of the responses, it can be seen that Internet sources (websites run by experts and internet users) constitute over 35% of all answers.

Table 1.

Information sources selected by respondents

Information source	The number of responses	Percentage of responses	Percentage of cases
Website run by experts	120	20,87	50,00
Family, friends	109	18,96	45,42
TV, radio	93	16,17	38,75
Internet user	85	14,78	35,42
Experts (e.g. doctor, dietitian)	62	10,78	25,83
Scientific literature	58	10,09	24,17
Courses, classes at school/university	34	5,91	14,17
Other	14	2,43	5,83
Total	575	100,00	-

Source: own study.

5.2. The sources used to obtain information about the impact of nutrition on health versus the level of respondents' knowledge

The majority of respondents assessed their level of knowledge as “average” (68%). Only 4 respondents perceive themselves as experts in nutrition, while 37 claim that their level of knowledge on good nutrition is very high. These two groups were merged into one category “high”, and this accounts for almost 15% of all study participants. The number of people representing low and very low level of knowledge was slightly higher. Five persons described themselves as not having any knowledge and being completely not interested in the topic, while 30 respondents admitted that their knowledge on nutrition is limited. In total, these two groups (low and very low level of knowledge) constituted 17% of all survey participants. Table 2 shows the results after reducing variable “the level of knowledge” to 3 categories.

Table 2.

The level of knowledge perceived by respondents, after reducing the number of categories to 3.

Perceived level of knowledge	The number of respondents	Percentage of respondents
High	41	14,6
Average	164	68,3
Low	35	17,1
Total	240	100

Source: Own study.

The subsequent stage of data analysis involved studying whether the information sources selected by consumers have impact on their level of knowledge. To that end, extreme values were compared – low and high level of knowledge as assessed by respondents was juxtaposed with the information sources. The analysis covers four most popular information sources selected by the respondents. Table 3 shows comparison of the information sources with subjectively perceived level of knowledge.

Table 3.

Utilizing information sources vs. respondents' level of knowledge

Knowledge source	The level of knowledge (percentage of cases) ¹			Difference of knowledge level: high – low
	low	average	high	
Websites run by experts	22,86	56,46	76,32	53,46
Family/friends	54,29	52,38	34,21	-20,08
TV/radio	40,00	48,30	21,05	-18,95
Internet users	22,86	41,50	42,11	19,25

Source: Own study.

¹ The percentage of cases does not sum up to 100% as participants could provide multiple responses to the question regarding knowledge sources.

The differences in the level of knowledge calculated for individual information sources indicate that the greatest number of respondents with high level of knowledge use websites run by experts. A positive result was also obtained for category “Internet users”. In the case of source “family/friends” and “TV/radio”, it is clearly visible that it is utilized mostly by respondents with the low level of knowledge. The differences in the level of knowledge for particular information sources are presented in Figure 2.

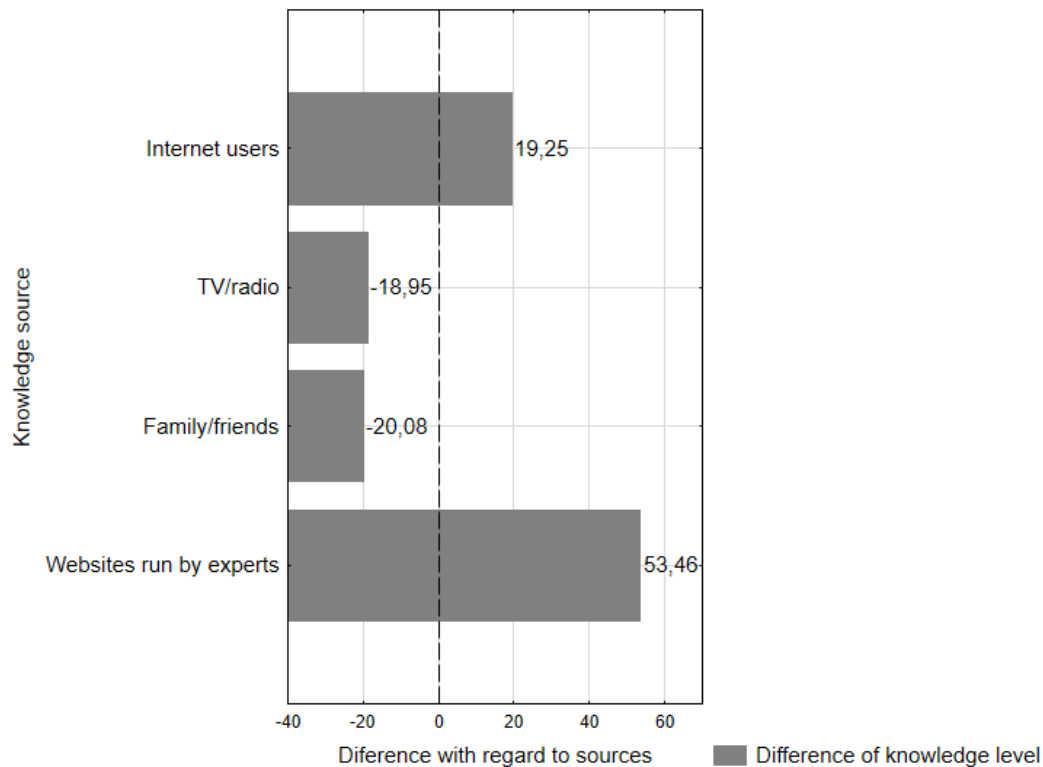


Figure 2. The difference in the respondents’ level of knowledge depending on the information source. Source: Own study.

Correlation between the subjective level of knowledge and the information source selected by respondents was examined using Chi-square test for independence with Yates’ correction². The strength of the relationship was computed by applying the Spearman's rank correlation coefficient. Assumed confidence level was $\alpha = 0,05$. The results of the Chi-square test for independence (with Yates’ correction) revealed a significant correlation between self-assessed level of knowledge and the sources of information chosen by consumers only in the case of websites run by experts. The Spearman's rank correlation coefficient indicated a moderate positive relationship (0,48, at $p < 0,001$). Based on the test results it can be inferred that the persons visiting the above-mentioned sites show higher level of knowledge on foods and proper nutrition.

² Yates’ correction is used in the case of small 2x2 contingency tables.

6. Conclusions

Empirical studies have allowed answering the research questions presented at the beginning of this paper. The research involved identifying major sources of knowledge utilized by the respondents in searching for information concerning proper nutrition. The most popular source is represented by websites managed by experts, followed by family/friends, TV/radio and Internet users. Based on the investigation of the relationship between subjective level of knowledge and information sources, it can be concluded that websites maintained by experts constitute an effective and valuable tool for spreading knowledge on foods and adequate nutrition. The analyses revealed a significant correlation between the respondents' level of knowledge and use of sites run by experts as a source of information concerning proper nutrition. With regard to other analyzed information sources, further studies with larger sample size should be conducted.

Allowing for the results of empirical research presented here and conclusions drawn based on literature review pointing to the importance of the information search in the consumer decision-making process, it can be deduced that there is a gap in marketing strategies applied by companies operating in the food sector. These companies could benefit from expanding their marketing strategy through involving experts (e.g. food technologists, dieticians and nutritionists) in the process of sharing knowledge on food and nutrition on the Internet. This could translate into positive purchase decisions by consumers searching for food products to improve their diet.

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