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Article

# Influence of the Emotion of Fear on Patterns of Consumer Behavior toward Dietary Supplements during the COVID-19 Pandemic

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**Abstract:** The focus of this paper is placed on the role of emotions in consumer behavior, specifically in the process of purchasing dietary supplements during the COVID-19 pandemic. The theoretical part is based on current knowledge from relevant Croatian and foreign scientific and professional literature on dietary supplements, the COVID-19 pandemic, consumer behavior, decision-making and the impact of emotions on it, while the empirical research portion of this paper details the attitudes of consumers who buy food supplements, the role and importance of different emotions that have a greater or a lesser impact on the purchase of food supplements, with special reference to the timing of the COVID-19 pandemic, and the factors that make consumers decide to purchase food supplements. This research was conducted in the form of a survey that included 257 respondents who were actual users of dietary supplements. It showed that the main drive for buying dietary supplements during the COVID-19 pandemic is the emotion of fear, as the consumers perceived this new disease as a threat to their health and life.

**Keywords:** dietary supplements; COVID-19 pandemic; consumer behavior; behavioral economics; emotions



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## 1. Introduction

On a global level, the COVID-19 pandemic has caused numerous changes to people's day-to-day lives. To protect the health of the population, various measures were put in place, most of them to ensure compliance with this new regulation. These measures, brought on by the relevant institutions, have forced people to isolate themselves, to conduct business and to partake in education from their own homes, and, in some cases, they have halted businesses and travel completely. One might even say these measures have caused people to cease living their lives to the fullest. But these challenges have also brought on some positive changes—people have started seriously contemplating their health and taking targeted actions to ensure its preservation. The importance of one's relationship with oneself and one's own health has never been more prominent than in the times of the pandemic. Dietary supplements typically enter this picture by way of answering the "How to best preserve your health?" question. Dietary supplements are to be added to the regular diet to enrich it, given that they contain various vitamins, minerals and similar substances important for the preservation of the immune system and human health in general. The lives of people around the world have changed significantly during the pandemic. In addition to the milder or more severe consequences for people's physical health, their mental health is also strongly influenced by the current pandemic. In this regard, many people have experienced depression, loneliness, anxiety, fear, panic, stress, trauma (Fiorillo and Gorwood 2020) and suicidal tendencies (Sher 2020), and there is evidence of abuse of

children and women in the family (Bradbury-Jones and Isham 2020; Lawson et al. 2020), etc. In addition to the negative consequences for human health, the COVID-19 pandemic has led to a huge decline in economic activity and the global economy (Praščević 2020), changes in mobility flows (Bonaccorsi et al. 2020), losses in tourism (Gössling Stefan and Hall 2020) and others.

The awareness of dietary supplements and their importance to health preservation has increased in the last couple of years, simultaneously with the appearance of the general healthy nutrition trend. This trend has greatly affected the general public, as people nowadays have endless means and sources of information, research and education; furthermore, marketing activities are typically lurking around every corner, striving to redirect our attention toward the newest thing on the market. The modern-day consumers are more educated than ever before. They are characterized by a more prominent attitude; they know what they want and they are convinced they are able to make a logical and, therefore, the best possible decision after taking into consideration all the information and influences they have been exposed to. However, when it comes to decision-making, the cognitive portion of the consumer's brain is not the only part that is engaging. Apart from the cognitive part, which includes understanding, evaluation, thinking and planning, the affective portion also plays a significant role in decision-making. Humans are complex beings that, often subconsciously, rely on their emotions. This mechanism is a part of the human heritage, passed down to us from our ancestors who lived tens of thousands of years ago, which enabled their survival in the difficult conditions they lived in. One might say that the human emotional system plays the same role today as well—it helps people face different obstacles and helps them make the best possible decisions to make their increasingly taxing day-to-day lives a little bit easier. Emotions are often the initiators and the triggers for many human actions, such as the decision to make a purchase. Accordingly, this paper explains the correlation between the three main factors: the pandemic, dietary supplements and human emotions, i.e., the influence of emotions on the purchase of dietary supplements during the pandemic. Dietary supplements are considered to be preparations made from concentrated sources of nutrients or other substances with a nutritional or physiological effect that have the purpose of further enriching the usual diet to maintain health. Nutrients are vitamins and minerals; other substances are amino acids, essential fatty acids, fiber, organs and extracts of plant species, microorganisms, edible fungi, algae, bee products and other substances with nutritional or physiological effects. We find them on the market in dosage form, i.e., forms such as capsules, lozenges, tablets, pills and the like, powder bags, ampoules of liquid, dropper bottles and other similar forms of liquid and powder.

The subject of this paper is the analysis of the purchase of food supplements during the COVID-19 pandemic, i.e., after the end of the first “lockdown” in May, 2020 in pharmacies in Zagreb. The paper explores the extent to which the emotion of fear is present in the purchase of dietary supplements during the COVID-19 pandemic. The paper focuses on the following research questions: (1) How do emotions of fear affect consumer behavior? (2) To what extent does it have an impact on changing the established pattern of consumer behavior? (3) To what extent is the fear for one's own health the cause of additional consumption of food supplements in the form of minerals, vitamins and the like? This paper fills a research gap in the literature that analyzes consumer behavior during a pandemic and analyzes the emotion of fear. The most important contribution of the paper is to identify the emotion of fear during the COVID-19 pandemic as a motivator for the consumption of dietary supplements in order to preserve health. Based on the analysis of the previous literature, a conceptual research model was defined, which describes the influence of demographic variables, propensity to compulsive actions that arose as a reaction to obsessive thoughts with the aim of reducing anxiety. The COVID-19 pandemic has greatly changed the experience of the world, where consumers perceive the world around them as a source of infection during the “lockdown”, while developing a fear of getting a contagious disease and the tension associated with the possibility of infection. The paper investigates how and to what extent the analyzed factors such as the fear of infection,

and social phobias affect the purchase of dietary supplements, which leads to new insights into insufficiently researched links between these factors, the fear of infection and the purchase of dietary supplements. The coronavirus pandemic has caused many changes in people's lives, and suddenly there are many challenges that need to be answered, both in professional life and in personal life. Uncertainty, inability to plan and forecast, public health and restriction measures, financial losses, and job losses, changes in life circumstances such as online teaching and work from home are just some of the stressors that have increased risk and need to control life, taking responsibilities and healthy behavior that does not endanger the environment. The increase in the need for active shaping of everyday life instead of continuous negative thinking has also increased the need for dietary supplements that are intended to enrich the usual diet in order to maintain health. The coronavirus pandemic has caused many changes in people's lives, and suddenly there are many challenges that need to be answered, both in professional life and in personal life. Uncertainty, inability to plan and forecast, public health and restriction measures, financial losses, and job losses, changes in life circumstances such as online teaching and work from home are just some of the stressors that have increased risk and need to control life, taking responsibilities and healthy behavior that does not endanger the environment. The increase in the need for active shaping of everyday life instead of continuous negative thinking has also increased the need for dietary supplements that are intended to enrich the usual diet in order to maintain health.

Levels of stress and anxiety and perceived risk of infection have been shown to be associated with the adoption of precautionary measures and increased consumption of dietary supplements, as consumers perceive them as helping to boost immunity. Therefore, the basic goal of this paper is to determine the impact of fear as an emotion that causes an increase in the consumption of dietary supplements during the COVID-19 pandemic. Dietary supplements are a concentrated source of nutrients or other ingredients with nutritional or physiological functions, alone or in combination, marketed in dosage form, to support nutrient uptake in the normal diet and to supplement the diet with substances normally ingested that the body does not receive in sufficient quantities, all for the purpose of a beneficial effect on the health of consumers. Dietary supplements can be vitamins, minerals, fatty acids, amino acids, enzymes, plant extracts and live cultures of microorganisms. In this way, the general resistance of the organism to stressful external influences is increased and it helps to maintain the proper physiological functions of the organism and its parts. Based on numerous scientific studies, dietary supplements find their place in the field of "preventive nutrition", as well as in the field of "prevention of good health". By taking this special type of food, the consumer is given the additional opportunity to help his own health on his own or with the help of a professional. The quality of food supplements and their active ingredients affect overall health because the composition and purpose are the purpose of placing such a product on the market. Therefore, it is necessary to control the quality composition, especially active ingredients, in addition to the usual health parameters for a particular category. Dietary supplements are divided into several categories that are subject to (usually seasonal) changes, and as they are formed by several different criteria, they are almost always intertwined and one product is in two or three different categories. The process of managing categories of food supplements first divides them into groups, and only then forms categories within each of the groups. Ultimately, it also divides each category of dietary supplements into a larger or smaller number of subcategories that are most susceptible to seasonal allocations.

The basic groups into which the entire range of dietary supplements is divided are the group of essential nutrients, the group of non-essential nutrients and the group of preparations within the first and third groups of the category that are formed by the type of active substances contained in the products concerned. Within the group of essential nutrients there are the following categories and subcategories of food supplements: category "Vitamins" (subcategories: multivitamin preparations, vitamin A, vitamin D, vitamin E), category "Minerals" (subcategories: calcium, magnesium) and category "Essential fatty

acids" (no subcategories are defined within this category). Within the group of nonessential nutrients, no categories have been formed according to the criteria of active substances, but the products of this group are entirely distributed according to the categories formed according to the described criterion of "need". These are products such as glucosamine, creatinine, etc. Within the group of preparations, the following categories and subcategories of food additives have been formed (it should be noted that these products are also incorporated into the categories described below): category "Herbal preparations and extracts" (subcategory: ginkgo biloba), category "Bee products" (subcategories: honey, propolis, royal jelly), category "Probiotics" (no subcategories are defined within this category).

## 2. Influence of the COVID-19 Pandemic on Consumer Habits

Nielsen is a global data measurement and analysis company that has been providing insight into consumer habits and markets all over the world for over 90 years. This company has conducted a global study on consumer behavior during the COVID-19 pandemic. The global dietary supplement market was valued at around USD 101.38 billion in 2018 and was expected to double that amount in 2020 (approx. USD 220.3 billion), with further growth (Aysin and Urhan 2021, p. 9). Considering global and national data on the dietary supplements market before pandemic, it was prognosed to rise by around 7% annually through 2025 generally in the world, and 5% in Poland (World Health Organization 2020). However, according to a report published in October 2020, the sales of dietary supplements had increased dynamically in the wake of COVID-19 in most of the countries and also in Croatia. At the beginning of the pandemic, some types of DSs recorded even triple-digit growth rates (World Health Organization 2020). The industry's growth was led by vitamin sales, which spiked to 22.3% growth in 2020 amid the pandemic. Vitamins added USD 3.24 billion to total supplement sales, accounting for nearly half of total dollars added in 2020. This is in contrast to 10 years of fairly flat sales in the vitamin category (World Health Organization 2020). The number of respondents in Croatia was 1017 ( $n = 1017$ ) and the survey was conducted from 25 March 2020 to 2 April 2020. The citizens of Croatia went through the first four stages in the time from the first infection case on 25 February to 22 April 2020. When the data on global infection cases were first published, people were faced with a health threat that was purported to be deadly by the media and governments from all over the world. These types of global events affect people as individuals and therefore influence their ways of consumption. This two-month period was split into five stages. The fear of the unknown virus and ignorance of what was about to happen and what measures the national civilian headquarters would introduce prompted residents to make large purchases and stockpiles. The research has also shown that there were changes in purchases. According to the data, the consumption of food and medicine compared to the same period a year before the pandemic increased by 20%. As the pandemic spread, the sales increased by 21.4% in February. In March, consumers were already quite worried and, due to the fear of the quarantine, they started to collect stocks of products and there were increasing crowds and queues in shops and malls. Sales peaked between 9 and 15 March, rising to a whopping 65.7%. After this phase of mass shopping and stockpiling, the situation in stores calmed down as consumers filled their pantries and exits from houses were reduced to a minimum. Due to this change, which occurred at the end of March, sales fell to—2.2% compared to the same period of the previous year. Product quantities were reduced until Easter week, when consumers again decided to replenish stocks and equip themselves for the upcoming holiday. Nielsen compared the sales of food and drug products. Prior to the creation of stocks, food and drugstore products had a similar trend in sales. When we consider the total sales of food and drug products, the sales of drug products were lower by 19.9%, but after food stocks were created, higher sales of drug products began. Consumers began to build up inventories of products, and some products recorded a large increase in sales. Among the food products, these were flour, rice, cake powders, pasta and instant puree. Non-food products included soap, wet toilet paper, toilet paper, toilet cleaners and baby wipes. The biggest increase in sales, of 410%, was recorded

for flour, followed by soap with an increase of 232%. Apart from the increase in sales of food and drug products, the Nielsen agency also showed an increase in sales of cleaning products, protective masks and skincare products. As much as 60% of consumers said they consumed more hand-care products during the crisis, and 40% said they would continue to use them after the crisis. Protective masks were a big topic during the coronavirus era with 51% of consumers using protective masks, and 46% of them saying they would continue to use protective masks after the pandemic ([Central Bureau of Statistics of the Republic of Croatia 2020](#)). Consumption at the time of the onset of the pandemic was conditioned by preparation for quarantine life and a return to “normal, everyday life” and is defined through six phases:

1. Proactive purchasing with emphasis on health;
2. Reactive health management;
3. Stockpiling;
4. Preparation for life in quarantine;
5. Constrained living;
6. Life in the new normal.

In the period of only one month, from February 2020 to mid-March 2020, when the pandemic was officially declared, the consumption in drugstores increased by 20.1%. Once the lockdown was officially declared during mid-March of 2020, Croatian people began stockpiling in preparation for the quarantine, which meant that grocery and drugstore product sales increased by 65.7% in comparison to March 2019.

The most purchased grocery item was flour. Flour sales increased by 410% in one week compared to the previous year. Furthermore, rice sales increased by 300%, followed by various cake preparation powders and pasta with a 221% increase. When it comes to personal hygiene and household supplies, soap sales increased by 232%, whereas moist toilet tissue sales increased by 180% and generated more demand than regular toilet paper. Regular toilet paper was the most stockpiled item, and its sales increased by 162% compared to the previous year. The pandemic and the resulting crisis have caused a certain emergency novelty when it comes to consumer behavior—an increase in internet shopping. Clothes and electronic sales have noted the biggest increase in sales, followed by medical products. This is highly logical, given that in the times of a health crisis, consumers often turn to new healthy habits such as shopping for dietary supplements and other products aimed at strengthening the immune system. The internet shopping trend still continues to grow even after the initial coronavirus crisis stage.

The aforementioned research indicates that the pandemic and the ensuing uncertainty have resulted in altered consumer behavior. The available information shows that the first wave of the pandemic during the initial lockdown caused an increase in demand for certain product categories. These products were typically stockpiled in preparation for the upcoming inability to leave the house. The fear of the unknown, the uncertainty, the disease and, in some cases, death have caused a major panic response and an impulsivity that has altered the existing purchasing patterns. This fear was at its peak when the unknown illness was first encountered. The initial fear and panic, as well as facing the decisions made by the Civil Protection Headquarters, the lockdown and the implementation of the new measures during the first year of the pandemic have caused panicky consumer behaviors and impulse purchases that are now beginning to subside. Even though the pandemic is still ongoing, it has already been around for over a year, forcing people to adapt to this ‘new normal’ by way of questioning their values and habits, becoming aware of matters related to their own health and facing their fear of the disease, as well as purchasing products they consider important to their wellbeing and health. During these uncertain times, when faced with a condition they cannot control, consumers often turn to behaviors that allow them to restore a certain degree of control over their habits and behavioral patterns, creating a sense of security.



### 2.1. Can Fear Change Consumer Behavior Patterns?

Babić and Babić (2020, p. 26) point out that “the Coronavirus disease (COVID-19) is a very severe infectious disease caused by the severe acute respiratory coronavirus 2 (SARS-CoV-2) which spreads from person to person relentlessly and rapidly worldwide. It was created in Wuhan, China, in early December 2019, and on 13 March 2020, the World Health Organization (WHO) declared Europe the center of a pandemic”.

The COVID-19 pandemic has fundamentally changed the world we know and live in. Most people live differently, buy differently and also think differently. The consumer goods industry is changing in real time, accelerating long-term underlying trends in just a few weeks. The new habits that have now been created could be maintained even after the coronavirus crisis, which indicates a permanent change in consumer buying habits, how and where they buy, how they live and what they do. Consumers are more than concerned about the impact of COVID-19, from both the health and economic perspectives. People react in different ways and have different attitudes and behaviors and shopping habits. The fear is heightened the moment individuals start thinking about what the coronavirus crisis means to them and, more importantly, what it means to their families, friends and society at large. Due to social distancing, according to the instructions of the Civil Protection Headquarters, consumers have limited choice of locations for shopping. At the same time, consumers have more flexibility because they do not have to follow planned schedules to go to school or to shops.

Sheth (2020, p. 280) considers that the accumulation of certain products is a common reaction to consumer uncertainty regarding the future supply of basic necessities. The accumulation of products is a common reaction when the country is going through hyperinflation. In addition to the product accumulation, a gray market is emerging where unauthorized intermediaries are accumulating their products and increasing prices. This is exactly what happened to protective equipment and disinfectant products, including N95 masks. Improvisation occurs in most cases when there are restrictions. In the process of improvisation, existing habits are rejected and new views of the world, product or services are adopted, and new ways of consuming and procuring products appear. At the time of the coronavirus crisis and uncertainty, there is a tendency to delay the purchase and consumption of certain products or services. This is related to products such as cars or buying a home. Such an approach results in a shift in demand toward the future, at a time when one can start talking about the ending of the pandemic.

Numerous consumers have been forced to adopt new technologies and master their application. A good example is definitely the Zoom video service. Due to the growing number of COVID-19 patients, most households were forced to learn to participate in meetings via the Zoom platform. The influence of digital technology, especially social media, is widespread in the daily lives of consumers. Limiting the number of consumers who can be in a particular store at the same time led to the “online” stores. With the growing number of people living with the COVID-19 virus, individuals were doing their jobs from home. For consumers at the time of the “lockdown” so far, the same living space becomes a cramped space in which they socialize with family members, perform work tasks, study and shop online. It is analogous to matching too many needs and wants with limited resources. As a result, there is a blurred line between private and professional life. Given the more flexible time spent at home, many consumers have experimented with recipes, discovered or practiced their talent, creatively shared learning and made their purchases online. Now more than ever, the YouTube page is full of records that have the potential for innovation and even business success (Sheth 2020).

The pandemic caused by COVID-19 led people to change their patterns of behavior. The level of fear and anxiety among citizens, especially during the “first lockdown”, was quite high. Measures to combat the spreading of the virus and the control measures resulted in some people with a counter-effect and increased their fear and dissatisfaction. Changes in shopping patterns, and thus shopping channels, that were due to the temporary closure of shops, restaurants, fast food services and the limited movement of people affect consumer

behavior and their way of communicating and their way of life. People react to changes and crises in different ways. Given the uncertainty of the situation, over which there is no control, it seemed likely to try to do everything to make consumers feel as if they had some control in their own hands. As news of COVID-19 spread even after it was officially declared a pandemic, consumers responded by gathering supplies or stockpiles. They bought large quantities of medical supplies such as hand sanitizers and face masks, as well as household supplies such as toilet paper, flour and yeast. The fear of the unknown drives people to dramatic behavior. Fear is an emotion that has the function of protection and is activated in situations when the environment poses a threat to our health and safety. The daily exposure to information in the media about the coronavirus, especially the video material about people suffering from the coronavirus, certainly contributes to the fear. An all-day media exposure increases the feeling of fear, which makes people read and hear even more about news related to the coronavirus, creating a vicious circle of fear from which it is very difficult to escape. The coronavirus epidemic is still one big unknown and, as it is still not clear how long the epidemic will last, people become insecure and this uncertainty makes them panic. Accordingly, it can be concluded that hoarding is a natural human response to existing or potential shortages and is driven by people's efforts to minimize the impending risk. Such behavior is emotional, not rational. It is driven by fear, panic and anxiety. It occurs more often and to a greater extent in those people who find it harder to cope with insecurity and stress, and who are currently present. Such behavior is spread by observing others. The coronavirus causes disruptions in all spheres of life, so it has a pronounced impact on the economy and the functioning of the world economy. Various economic experts believe that this is a crisis that came very quickly and caused a sharp decline in economic activity. To slow the spread of COVID-19, the world's economies have largely used two approaches. The first approach is to identify and exclusively quarantine infected people. This has been done by countries such as Singapore, Taiwan, South Korea and the like whose governments have the ability to use developed technology and information for monitoring and the ability to conduct population testing. The second approach is used by countries such as the United States and those in Europe and it is about the adoption of social distancing, the introduction of bans and closing borders, but also facilities such as catering. Initially, the view was accepted that it would be a health crisis, but as the authorities responded by introducing measures there were concerns in various economic sectors and industries. Due to the travel ban, there are problems in the transport sector, which cause a chain reaction to tourism, the import and export of goods, the oil industry and the like.

By canceling various events, gatherings and sports activities, the entertainment and sports industry found itself in trouble. The COVID-19 pandemic, as mentioned earlier, affects people's behavior; the usual routines of everyday life change and so do shopping and shopping habits. Any economic crisis changes consumer habits at least temporarily, depending on how labor market circumstances change, on credit conditions and on whether concerns about financial security grow in these uncertain times. Apart from the fact that consumption is affected by current income, it is also affected by expectations about future income, i.e., whether there is a fear that the crisis will reduce wages or people will be fired. Worldwide, more than 60% of consumers have changed their shopping behavior. When consumers could not find the desired product at the desired retailer, they changed their shopping behavior; for example, many consumers tried another brand during the crisis or bought from another retailer. In the US and China, more than 75% of consumers have tried a new method of buying, while in Japan, where lockdowns were less stringent, a comparative number is 33%.

At the very beginning of the COVID-19 pandemic, governments around the world had decided to introduce various measures and ultimately the introduction of a "lock down", which caused discomfort and panic among consumers. People began to accumulate supplies; for example, in Croatia at one point there was a shortage of yeast. Panic is also visible in the trends, in the week of 9 March, sales were as much as 66% higher than in



last year ([World Health Organization 2020](#)). Most people have turned to buying pasta and frozen groceries, all on the principle of having a long lifespan to insure during quarantine. Consumers spend more on food and drugstores than others. Trends in Croatian retail compared to the same period last year show that the basket of food and drugstore products increased by an average of as much as 20% (Croatian Chamber of Crafts 2021, [Central Bureau of Statistics of the Republic of Croatia 2020](#)). As the epidemic spread, so did sales, so the first peak was at the end of February, with sales growth jumping by 21.4% (Croatian Chamber of Crafts 2021, [Central Bureau of Statistics of the Republic of Croatia 2020](#)). Due to investments in exclusively food and drugstore products, retailers of non-food products such as clothing, household appliances and furniture, beauty products and the like experienced a significant decline in sales. This is best seen from the decline in sales during March and April in the US, where there was a decline of about 40% in grocery stores and a decline of about 60% in clothing, fashion accessories and cosmetics ([World Health Organization 2020](#)). To save business, most retailers are turning to online shopping and delivering their products to the doors of consumers, not only non-food retailers but also food retailers. During the period of the most severe epidemiological measures, markets were closed and consumers who buy fresh vegetables and fruits were forced to look for alternatives. This proved to be profitable for family farms that managed to adapt to serious changes in the market in a short time. Family farms relatively quickly formed a rich offering of fresh vegetables and delivered fruit directly to customers directly to the door. Consumers recognize simplicity and ease as the main advantages of online shopping, at any time of the day and without waiting in lines, all without the possibility of infection. As for shopping in the stores themselves, they have become different due to the introduction of various measures to prevent the spread of infection. Business FM (2020) (according to [Fairlie 2020](#)) presented the results, conducted by the consulting and communication agency EQUESTRI, on the impact of the coronavirus and changes in shopping habit, in the time period from 10 to 14 April 2020 on a sample of 600 respondents in Croatia. They examined what measures were taken by respondents to be the most important for a sense of security when making physical purchases and these are the prescribed distance between people who buy (77%), the possibility of hand disinfection (74%), the regulation of the number of customers within the store (71%), the use of protective equipment (67%), pre-packaged products such as fruit bread and the like (54%) and protective glass at the box office (42%). The emergence of this pandemic has encouraged consumers to save and buy only what is necessary for life. According to the above-mentioned research, compared to the time before the coronavirus epidemic, Croatian consumers almost halved their daily purchase by up to HRK 200 (from 36% of respondents before the epidemic to the current 18%) and doubled it on a weekly basis (from 14 to 30% of respondents) (Croatian Chamber of Commerce 2021, [Central Bureau of Statistics of the Republic of Croatia 2020](#)). For purchases above HRK 200, the trend of weekly purchases strengthened. There was also a change in the choice of store, with respondents most often citing the distance to the store and the crowds as reasons. According to the results of the research, the respondents now make a large purchase over HRK 200 once a week. For small purchases under HRK 200, they often do it once a week, and a little less often every day or several times a week. Although there are differences and specifics for the stores included in the research, the most important elements for choosing which store at which to make small purchases are proximity, product availability and prices, while for large purchases respondents emphasize proximity, range and the price-quality ratio.

Economists are trying to measure people's expectations with consumer confidence surveys, a drastic drop in consumer confidence that is due to the crisis caused by the COVID-19 pandemic in the world. For example, in Croatia it is higher than the European Union average. Consumers feel extremely insecure about their future financial position and economic future. When this happens, consumers temporarily change their consumer habits by giving up buying durable goods and this mechanism is the same in every crisis, regardless of its cause. Buying a car, furniture or TV is delayed. Purchases of goods and

services whose demand is very sensitive to changes in income, such as going to restaurants or traveling, are also declining. According to the latest data from the CNB's Consumer Confidence Survey (conducted on a monthly basis to examine consumer opinions regarding the current state of economic phenomena they face on a daily basis, as well as expectations regarding future economic trends in their household and Croatia) for July, the index of consumer confidence, expectations and mood, after recovering in June, in July there was a decline on a monthly basis, while compared to the same month last year; for the fourth month in a row it continued to decline in all three indices. The Consumer Confidence Index (CPI) recorded a score of  $-18.0$  points at the end of July. The Consumer Expectations Index (IOP) was  $-18.4$  points, while the Consumer Sentiment Index (IRP) was  $-27.6$  points at the end of July. These changes in the confidence index are still significantly lower than in 2019, thus maintaining increased caution, uncertainty and fear that the consequences of the pandemic will have adverse effects on the real economy and labor markets.

### *2.2. Changes in Consumer Habits Conditioned by COVID-19*

The pandemic has contributed to building new shopping habits and new thinking in the minds of consumers. The impact of the COVID-19 disease on the daily behavior of the modern customer has aroused a sense of panic and fear in the minds of consumers. At the beginning of the pandemic, empty shelves in stores and excessive accumulation of longer-lasting food and hygiene items were caused by customers' awareness of the instability of life with the arrival of an unknown disease that they could not control themselves (Carranza et al. 2020). Will the coronavirus make lasting changes to consumer psychology? Forbes (Online) American psychologist at the Chadwick research agency Martin Bailey explained that consumers are very complicated creatures who are guided by different motives at the same time when shopping. The purchase made by the consumer is associated with his values, habits and social norms. With the advent of the COVID-19 disease, the motives for buying changed abruptly; once driven by a sense of control, they quickly became driven by existential fear. He also states that consumers, despite the end of quarantine and major travel bans, have created a new motive for shopping, namely that consumers have started buying products that they have never had the habit of buying. Recognizing that health is the most important thing, psychologists believe that consumers have become much more aware and careful in buying and choosing stores. Of the 1000 respondents, 79% of consumers said they were much less likely to go or not to go to restaurants, while 43% of consumers admitted that they had acquired a greater habit of ordering food and drinks outside. In addition, 32% of consumers want to spend lost time doing everything that was forbidden because of the pandemic and various bans.

### **3. Dietary Supplements**

During the last couple of years, the awareness of the importance of healthy nutrition and its beneficial effects on human wellbeing has been rising; therefore, it is not surprising that more and more consumers are turning to a new, healthier lifestyle. Moreover, the modern consumers are growing more and more demanding and informed, and are therefore drawn to dietary supplements in an effort to preserve and improve their health. These supplements are aimed at enriching the regular diet to maintain and improve health; hence, they fit perfectly into the healthy lifestyle trends of today. This was not always the case, as the scientific breakthroughs proving their efficiency were not as common or effective as they are currently. For example, 30 years ago, pregnant women did not take prenatal supplements. Currently, consumption of such supplements is normal and encouraged, as it has been scientifically proven that they are beneficial to both the mother's and the child's health. Furthermore, it is common knowledge today that one is supposed to take probiotics along with the antibiotic therapy. These types of medical breakthroughs, as well as their acceptance among the general population, have contributed to a more positive attitude toward dietary supplements and their increasingly common consumption (Kesić 2006).

#### 4. Emotions

Emotions are experiences or states that have been triggered by certain events, situations, actions, other people, thoughts, expectations or plans. Emotions are a human's natural reaction to events happening on the inside or on the outside and are comprised of several factors (Petz 2006):

1. Physiological changes caused by the autonomic nervous system (e.g., rapid breathing, an increased heart rate),
2. Cognitive interpretation or evaluation,
3. External signs or expressions (e.g., shaky hands, paleness of skin, red spots), and
4. Behaviors or reactions to the experienced emotions.

Fear also stimulates greater brand attachment and, according to one study, people remember better the ad that caused fear in them than the happy and optimistic ads (Kaylene 2014). By studying various research of emotions in psychology, different points of view can be found in defining, studying and explaining emotions. Psychologists have offered different definitions, each of which focuses on different components of emotion. Since it is not precisely defined which component of emotion is sufficient to measure emotional experience, the following components have been identified:

- Behavioral reactions (eng approaching),
- Expressive reactions (eng smile),
- Physiological reactions (eng heart palpitations),
- Subjective feelings (eng a sense of fun).

All instruments for measuring emotions actually measure one of these components; the only difference is in the approach to measurement—measurement through rating scales, measuring eye movement, measuring brain waves, etc. In marketing practice, emotions are measured to know the effectiveness of a particular ad and emotional triggers that most affect consumer interest. First, stimuli that provoke emotional reactions and attract the attention of consumers (“primary attention”) are tested and then strong emotional stimuli that encourage consumers to pay more attention and take action (“secondary/permanent attention”). No matter how often a person uses logic and how rationally he thinks, according to various research by psychologists, he is primarily an emotional being who makes decisions based on feelings. When a person is confronted with emotionally enriched information, the emotional part of the brain processes data in one-fifth of the time required for processing in the cognitive part of the brain (Van den Bergh and Behrer 2013). Customers in Valden and Janevska (2011) often emphasize that they want to feel relaxed when buying; this same emotion in later issues did not appear among those that allow an improvement of business activities, which the authors attributed to a lack of the cognitive ability of respondents. The subject of this research is primary emotions in service industries. Among the 20 or so authors who offer representative examples of primary emotions, Ekman's (1992) model of primary emotions is used in the presented research. The main reason for choosing six primary emotions according to Ekman (1992)—joy, sadness, anger, disgust, fear and surprise—is that he participated in the actualization of Darwin's (1998) idea of universality in the 1970s: emotion. Namely, Charles Darwin was the first to advocate the idea of the universality of ideas and the primary emotions are, in fact, universal emotions. In addition to the term's primary, the terms basic or fundamental emotions are also in use, and they reflect the idea that these emotions form the core from which all other emotions are derived (Turner and Stets 2011, p. 32). Ekman and his collaborators established the universality of these six emotions from 1971 to 1975, while a little later, in 1986, they added the emotion of contempt to that list, and in 1992 listed nine features of the universality of primary emotions from their list. The number of primary emotions varies from author to author, but everyone agrees that happiness, fear, anger and sadness are universal emotions, and that emotions of a negative sign predominate.

Physiological changes caused by emotions are well-known to every man as they are the results of the evolutionary process. For example, when human beings experience fear,

their heart rates increase, when they experience anger, their faces turn red, when they are disappointed, their skin typically pales; they experience the so-called ‘cold sweat’ when faced with uncertainty and a loss of appetite when faced with sorrow. The basic function of these physical changes is to supply the organism with enough energy for it to be able to face a certain danger or to run away (Milas 2007). Cognitive evaluation is an act whereby the stimulus that triggered a certain emotion is interpreted, i.e., it answers the question whether the stimulus was useful or harmful. The external expression of emotion includes facial expressions, which are recognizable and the same in all cultures. Their main purpose is communication, i.e., expression of one’s emotional state to others. Emotions also act as motivators, directing our behaviors with the goal of achieving pleasant states of joy and contentment while avoiding the opposite. Low-intensity emotions typically activate people, increasing their interest in their current situations. High-intensity emotions, on the other hand, influence a person’s experience and behavior in an unfavorable way. Excessive emotional activation narrows the perceptive field, lowers concentration, hinders memory and reduces the ability to make logical conclusions. Cultural behavioral norms usually determine when it is acceptable (and to what degree) to show your emotions, as well as when it is required to control your emotional expression (Petz 2006). The fundamental factor that hinders any kind of dominant or final classification of emotions is the fact that there are nearly infinite possible combinations of two or more emotions. For example, the combination of surprise and sorrow creates the emotion known as disappointment. Each emotion is connected to a certain feeling, perception or thought, which furthermore contributes to more possible combinations and a heightened quality of the initial emotion.

According to some theorists, emotions can be divided into two main categories: pleasant and unpleasant emotions. This encourages individuals to direct their behavior toward sources of pleasure and avoid sources of discomfort. Some psychologists have split emotions into primary and secondary. Primary emotions are the ones that can be expressed by special facial expressions recognizable in all cultures all over the world. These expressions have been evolutionarily developed specifically to communicate this emotion. Some scientists claim that there are four basic emotions: joy, sadness, fear and anger; yet, it is widely accepted that the basic emotion classification includes six fundamental emotions: joy, sadness, fear, anger, surprise and disgust (Petz 2006). When it comes to facial expressions and appearance alterations in accordance with certain emotions, evolution ensures that we keep the same things our ancestors used to survive and face their everyday challenges. For example, if human beings experience anger, their blood rushes to their arm muscles, making it easier to grab weapons or strike the enemy; the heart rate increases, and the rush of hormones such as the adrenaline causes the energy to spike and pulse in preparation for determined action. When faced with a surprise, raised eyebrows enable the reception of a wider visual impression, and provide more light for the retina. This enables the brain to receive more data on the unexpected event, making it, therefore, easier to figure out what is going on and what to do about it. The facial expression that displays disgust is the same all over the world and sends a universal message: something either tastes or smells bad (in the literal or metaphorical sense). According to Darwin, a raised and curled upper lip and a wrinkled nose indicate a primordial attempt at closing one’s nostrils before a disgusting smell or spitting out poisonous food. These natural reactions are further formed by personal life experiences and culture. For example, the loss of a loved one generally causes sorrow and pain. But the way people express their sorrow—the way they either show their emotions freely or conceal them until they are left alone—is determined by culture. Furthermore, culture determines which people are considered ‘loved ones’ and are to be mourned (Goleman 1997). When trying to determine why evolution gave such an important role in the human psyche to emotions, sociobiologists point out the leading role of emotions in facing troubles and tasks too great to be left to mere intellect only, such as danger, painful loss, determination to reach personal goals despite failure and obstacles, achieving intimacy with one’s partner, starting a family, etc. Each emotion offers a prominent readiness to act; each emotion points us in the direction that has already been

proven as the best path when facing repeating challenges of human existence. As these eternal situations kept on recurring during the history of human evolution, the importance of our emotional repertoire to survival has been confirmed. This is why these reactions remained engraved into our nervous system as something we now call congenital automatic reactions and propensities (Goleman 1997).

#### 4.1. Previous Research on Emotions

No one today can deny the key role of fear in initiating and legitimizing the daily extraordinary sanitary and political measures that disrupt our current mental and life habits. Moïsi (2008, p. 169) believes that emotions of fear are extremely important, rather irrational and magical-religious, or are based on guilt and stigmatization of a “deviant” behavior of certain groups and individuals in the form of “scapegoats”. In his discussion of the history of religions, Eliade (1996) pointed to the permanence of religious behavior and religious fears and magical relics, stating that even in modern society, in their various forms, the main themes of religious fears and behavior have not changed. Attali (2009, p. 275), an advocate for the abolition of borders and world government, explained that “history teaches us that humanity develops significantly only when it is really afraid”. Glassner (2009) in *The Culture of Fear: Why Americans Are Afraid of the Wrong Things* believes that the culture of fear propagated by the media is often at the service of the political class and seeks more to attract and direct public attention to “great threats” and less to everyday “small threats”. Fear as an emotion and as a trigger for a purchase is directed at the consumer’s social or psychological needs to purchase a particular product or service. Anić (2007, p. 539) defines fear as an unpleasant emotion, a state of anxiety and worry, as a physiological response to a perceived or recognized source of danger. Petz (2006, p. 470) views fear as “an intense and uncomfortable feeling about a perceived or anticipated danger, often associated with a desire to escape or hide”. Jenkins and Oatley (2007, p. 262) define it as interruption of current activity, calming (stiffness) and preparation for escape or struggle. Kesić (2006, p. 159) describes fear as a threat that contains some kind of danger and its goal is to provoke the attention and action of the recipient toward the behavior that will eliminate that fear, that is, the danger. Negative emotions are used to create an emotional imbalance that can be corrected by prominent (desired behavior). In marketing, the prevailing opinion is that customers, i.e., people in general, are primarily emotional beings who base their decisions mainly on emotions, while the rational part of behavior is mostly included afterward. If all this is true, it should be borne in mind that the essence of negative appeals is to provoke fear and/or guilt in the consumer in the hope that it will provoke the desired reaction.

Emotions are a key part of a person’s life and occur daily, during daily activities, but also during larger, more important events and milestones in life. In addition to being part of everyday reactions, emotional responses to various situations and relationships with people in different environments, they also occur when buying products, during exposure to various advertisements and marketing communications and greatly influence consumer behavior, attitudes, beliefs, opinions and motives (Lau-Gesk and Meyers-Levy 2009). Akbari (2015) states that fear affects the memory of consumers, while Mishra (2009) states that consumers are brought into a state of excitement or anxiety with the help of fear. From the above, it can be concluded that the purchase of a product conditioned by the emotion of fear in customers reduces the cognitive evaluation of a product’s characteristics, and they most often buy a product without thinking about the long-term consequences of the purchase decision. Furthermore, in scientific literature, emotions are observed in relation to the duration to ad exposure (Olney et al. 1991), to ad memorability (Amber and Burne 1999) and to the consistency of consumer preferences (Lee et al. 2009). The results show that emotions have a positive effect on all observed categories and encourage them. Thus, the presence of emotional content encourages longer exposure to the ad, just as ads with high emotionality are better remembered and better recognized in comparison to ads with a high level of cognitive content. Most authors in previous research have dealt with various aspects of compulsive shopping, but the impact of fear on buying and the extent to



which fear affects consumer behavior has been insufficiently explored. In accordance with the above, it can be concluded that fear stimulates consumption and during a pandemic draws consumers' attention to a particular category of products. The fear for health has proven to be one of the more important factors for the decision to buy not only various dietary supplements, but also other products.

#### 4.2. Influence of Emotions on Shopping

An important aspect of emotions is the tendency to act, which implies readiness to engage or disengage in an interaction with a certain objective in mind and includes the following impulses (Goleman 1997):

1. Moving toward,
2. Moving away from and
3. Moving against.

Readiness to act is closely related to the unique psychological evaluation conducted by the individual interpreting the act, not only to the act itself. Different people can display different emotional reactions (or lack thereof) to the same event because of differences in their expectations regarding the outcome. Facing ensuing emotions can be classified into four categories (Bagozzi et al. 1999):

1. The intention to remove or undo the damage,
2. Receiving help or support,
3. Minimizing the outcome,
4. Questioning the objective or doubling one's efforts, depending on the emotion.

The type of willingness to act and the act itself can be classified into different emotional categories, e.g., evasion can be related to fear. A good example is the flight reflex—when a person's life is at risk, fear will motivate them to run away. Another example of the tendency to 'move away from' is a student who is getting ready for a difficult exam held by a strict professor. The student will decide to employ the 'move away from' action and will therefore avoid taking the exam for fear of the said professor. This will happen because of the student's own interpretation that convinces them the professor is so strict it will be impossible to pass the exam. Furthermore, the student takes into consideration the perception of what else this event might bring—shame, humiliation, dissatisfaction, etc. On the other hand, when facing the aforementioned emotion of fear, the student can switch to a different class or ask the colleagues who have already passed the said exam for help, which means employment of category number 4 and doubling the efforts in order to master the task. Another example is the action tendency of 'moving toward' that occurs when we care about someone and are willing to do anything to help this person. If we win a prize, we wish to share our happiness with people close to us. When angry, a person is motivated to employ the action tendency of 'moving against' and strike back at their assailant.

Accordingly, it can be concluded that as a person's individual factors, emotions participate in the overall human behavior, including consumer behavior. Emotions are responses to the perception of external events and are formed by a person's assessment of occurrences that have happened or are currently happening. Emotions aren't created by specific events or physical circumstances, but by a person's interpretation of these events, i.e., by comparison between the existing conditions or results and the desired conditions or results. This is why different people have different emotional responses to the exact same events. When facing their own emotional state, humans create a tendency to act in an effort to regain their equilibrium, which can also include the act of making a purchase (Scheibehenne et al. 2009).

This tendency is well-known to marketing experts who, as communicators, utilize various stimulants to cause emotional reactions (which are a result of the overall psychological portrait of a person, of everything they have been through and of their every experience and feeling). These stimulants can be words, music or pictures and are used to encourage an emotional action tendency that will result in making a purchase, i.e., that will create a



need or excitement within the consumer. Excitement (incentive) plays a significant role when it comes to emotions. The environment in retail stores, marketing, background music, brand names and packaging represent stimuli utilized to stimulate emotional reactions. Advertising appeals make for the central portion of the ad, promising benefits and pleasures to customers who decide to purchase and consume certain products or services. Advertising appeals represent impulses or incentives that are based on psychology and used in advertising to activate wishes and feelings that create the need for the advertised goods and services (Kesić 2003).

## 5. Research Methodology

The topic of this research was the influence of the emotion of fear on patterns of consumer behavior toward dietary supplements during the COVID-19 pandemic. A total of 257 respondents participated in the survey. The survey consisted of 46 questions. The first question was an elimination question, where the respondents had to state whether they are using dietary supplements or not. Respondents had to answer this question with a “yes” to continue with the survey. For the purposes of the research, a questionnaire was created consisting of four parts: general data, health status and a series of questions about how the “lockdown” and how the COVID-19 pandemic in general affected the psychological state (anxiety, uncertainty, fear of losing a job and fear of infections) and the use of dietary supplements. The section on general data included, in addition to general questions (age, gender, body weight, height and education), also questions about the life habits of the respondents (smoking, alcohol consumption, physical activity, how to use free time before the pandemic and during the lockdown, -a” etc.). The part related to the health condition consisted of the anamnesis of the respondents (information on chronic diseases and the use of therapy), including questions related to COVID-19. Subjects suffering from COVID-19 reported symptoms of the disease and the presence of post-COVID symptoms. The section on the use of dietary supplements was filled in by all respondents regardless of COVID-19 (use before and during the pandemic, applied doses of vitamin C, vitamin D, subjective impression of the positive effect of dietary supplements used, etc.). The objective of this paper is to analyze consumer behavior toward purchasing dietary supplements during the COVID-19 pandemic, i.e., to determine whether consumers have developed emotions regarding these matters. An empirical study was conducted on a deliberate sample of 257 subjects who purchased a dietary supplement. As stated, the survey questionnaire consisted of 46 questions. After the socio-demographic questions, and the elimination question of whether they use or buy different dietary supplements, 23 questions were used to determine the impact of fear on the purchase of dietary supplements, and consumer behavior at the time of the pandemic. The research instrument consisted of a set of statements to which respondents responded by expressing their agreement/disagreement, using a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). The claims used in the research are taken from the literature (Sproles and Kendall 1986). The collected data were analyzed by a number of different statistical methods. The whole process of data analysis took place in three phases: (1) assessment of the reliability and validity of the applied measurement scales, (2) *t*-test to test the statistical significance of the difference between the two-arithmetic means and (3) *Z*-test to check the distribution value. The reliability of the applied measurement scales was assessed using the Cronbach’s alpha coefficient. In addition, the influence of individual statements on Cronbach’s alpha coefficient of the corresponding measurement scale was analyzed and, based on the above analysis, the statements that affect the reduction of the reliability of the corresponding measurement scales were identified. Such claims are excluded from further analysis and the research is based on 23 items. Furthermore, this paper is to determine the type of said emotions, how they affected consumption and which product categories were included. Therefore, the objectives of this paper are:

- To research whether dietary supplement consumption was affected by the pandemic and how,
- To identify which emotions consumers are experiencing during the pandemic,
- To determine whether consumers are using dietary supplements more often during the pandemic,
- To determine why consumers use dietary supplements during the pandemic, i.e., to identify the emotional incentive to purchase and consume supplements,
- To find out what impact the lockdown has on the consumer, i.e., what differences in emotions have influenced the purchase of dietary supplements,
- To determine which emotions consumers are experiencing during and after using dietary supplements.

In accordance with the stated research objectives, the following hypotheses were set:

**Hypothesis 0 (H0).** *The emotion of fear does not cause an increase in dietary supplement consumption.*

**Hypothesis 1 (H1).** *The emotion of fear is the initiator of changes in consumer behavior toward the purchasing and consumption of dietary supplements during the COVID-19 pandemic.*

**Hypothesis 2 (H2).** *The emotion of fear has had the biggest impact on consumer behavior toward the purchasing and consumption of dietary supplements during the lockdown.*

**Hypothesis 3 (H3).** *The attitude toward conspicuous dietary supplement consumption and the fear of the infection are positively correlated.*

**Hypothesis 4 (H4).** *A significant portion of the increase in dietary-supplement consumption during the COVID-19 pandemic can be explained by a linear combination of variables (the fear of the disease, death or infection) in the multiple-regression model.*

### 5.1. Discussion of Research Results

Despite the fact that in the official guidelines of the [CDC \(2021\)](#), the US national public health agency, there are no recommendations for the prevention of COVID-19 through the use of certain dietary supplements, but the recommendations relate exclusively to vaccination and socially responsible behavior, interest in dietary supplements is ubiquitous. Evidence of this is also in the numerous clinical studies that have been launched to determine the potential efficacy of vitamin C ([Adams et al. 2020](#)) and vitamin D ([Lordan et al. 2021](#)). As there is no specific drug for COVID-19, consumers perceive that dietary supplements will protect them from infection, or mitigate the impact of infection because of various claims that dietary supplements “raise” immunity ([Lordan et al. 2021](#)). In addition, another reason for the use of dietary supplements is their easy availability and the sense of security that they provide to the consumer ([Adams et al. 2020](#)), but also the fact that the use of vaccines is still not widespread and not available to everyone ([Hamulka et al. 2020](#)). The following are the results of the research.

Table 1 shows the socio-demographic structure of the respondents from which it can be seen that when they participated in the research, 59.5% (153) of the respondents were female, whereas the remaining 40.5% (104 respondents) were male. The majority of the respondents (32.3% or 83 respondents) were between the ages of 36 and 45, followed by respondents in the age bracket from 26 to 35 (29.2% or 75 respondents). In total, 48 respondents were between the ages of 46 and 55 (18.7%), 30 respondents were between the ages of 18 and 25 (11.7%), 17 respondents (6.6%) fell into the 56 to 65 age categories, whereas only 4 persons were over the age of 66 (1.6% of the respondents). Of the total, 139 respondents were college graduates (54.1%), 45 respondents have graduated from a community college (17.5%), 32 respondents declared they held a master’s degree (12.5%), whereas 12.1% of the respondents stated they were high school graduates (31 persons).

Only 3.5% of the respondents stated they had a doctorate (9 persons), whereas only 1 person stated they have completed only elementary school (0.4%).

**Table 1.** Sodio-demographic structure of respondents (n = 257).

	n	%
<b>Sex</b>		
Male	104	40.5%
Female	153	59.5%
<b>Age Group</b>		
16–25	30	11.70%
26–35	75	29.20%
36–45	83	32.30%
46–55	48	18.70%
56–65	17	6.6%
66+	3	1.6%
<b>Completed Education</b>		
Elementary school	1	0.4%
High school	31	12.10%
College	45	17.50%
High school	139	54.10%
Master's Degree	32	12.5%
Doctorate	9	3.5%
<b>Number of Household Members</b>		
1	44	17.10%
2	61	23.70%
3	62	24.10%
4	70	27.20%
5	20	7.8%
<b>Amount of Income</b>		
–3999	85	33.1%
4000–6999	22	8.6%
7000–8990	34	13.2%
9000+	43	16.7%

More than half of the respondents (61.5% or 158 persons) stated that their household income was in the 'over HRK 9000' category, 16.7% or 43 respondents said their household income fell within the 'HRK 7000 to 8999' category, 34 respondents (13.2%) reported the income between HRK 4000 and 6999, whereas 8.6% or 22 respondents reported the income below HRK 3999. About one-third, 33.1%, of the respondents (85 persons) were willing to spend anywhere between HRK 101 and 200 per month on dietary supplements, 23.3% (60 persons) were ready to spend anywhere between HRK 201 and 300, whereas 20.6% or 53 persons stated they would be willing to spend less than HRK 100 per month. In total, 31 respondents (12.1%) stated they would be willing to pay between HRK 301 and 400 per month for supplements, and only 28 persons (10.9%) reported being willing to pay more than HRK 401.

The focus of this paper are emotions during the pandemic, as well as the influence of fear on choosing and purchasing various products. In total, 64.6% of the respondents (166 persons) have experienced fear for their health, whereas 27.2% (70 persons) felt optimistic regarding matters of health preservation and 8.2% (21 persons) reported feelings of indifference. The respondents' answers were based on their own self-evaluation. Given that the survey was conducted between December 2020 and February 2021, this might represent a research limitation. People have experienced the pandemic in a different way when it first started and therefore acted differently. On the other hand, almost a year into the pandemic, peoples' attitudes and emotions have changed—the initial panic began to

subside and the citizens slowly began to adapt to the ‘new normal’. Accordingly, some people initially experienced fear, but now display complete indifference. Categorical data is represented by absolute and relative frequencies. The numeric data is described by the arithmetic mean and the standard deviation in cases where the distribution was normal, and by the median and the limits of the interquartile range where it was not. The normality of the numeric variable distribution was tested using the *t*-test, whereas reliability levels were tested using Cronbach’s alpha coefficient. Statistical analysis was conducted using the SPSS 25 program.

Reliability of the measurement scales was analyzed using Cronbach’s alpha coefficient (it is preferable to achieve a coefficient of minimally 0.7, whereas values over 0.8 indicate good reliability). Furthermore, ‘alpha-if-deleted’ indicators and ‘item-to-total’ correlation coefficients were utilized to identify possible claims that might cause a decrease in values of Cronbach’s alpha coefficient, as well as those that display a weak correlation with the total values of the appropriate measuring scale (values under 0 are generally considered problematic). Cronbach’s alpha shown in Table 1 indicates a coefficient of 0.744 for 23 items. The questionnaire has demonstrated good discriminant validity for all items, with the most successful discrimination between life quality and influence of work, financial income and life quality, and workplace and income uncertainty. The first part of the questionnaire referred to the socio-demographic structure, and to questions about consumption habits before the start of COVID-19. The influence of individual claims on Cronbach’s alpha coefficient of the corresponding measurement scale was also analyzed and, based on this analysis, claims related to the emotion of fear as a drive to buying food supplements during the “lockdown” were identified.

Based on the Cronbach’s alpha coefficients displayed in the previous table, it is possible to conclude that the applied measurement items possess high reliability levels, i.e., they are herewith confirmed as valid attitude and opinion measurement instruments. To compare data from scales of different ranges, it was necessary to transform this data and place it on one common scale. This was achieved by converting Likert scales into standard values from 1 to 5 according to the formula: %SM (scale maximum percentage) = (individual result/n) × 100. If the lowest value on the scale was 1, transformation was conducted according to the following formula: %SM = (individual result – 1) × 100/(number of scale points – 1). The obtained results have been summed up and presented in Table 2.

**Table 2.** Survey reliability measurement using Cronbach’s alpha coefficient.

Reliability Statistics		
Cronbach’s Alpha	Cronbach’s Alpha Based on Standardized Items	No. of Items
0.744	0.735	23

Apart from the small standard deviation, there are items where the noted standard deviation was 0, which meant that the variance was also 0. All of this leads to the conclusion that the evaluation of the obtained results is insignificant and that one can observe a high and prominent functional dependency (Table 3). The results point to the following conclusions: the majority of the respondents (101 persons or 39.3%) strongly agreed with the claim that they used dietary supplements to a greater extent than usual during the pandemic. In total, 46 respondents (17.9%) have mostly agreed with said claim, whereas 42 persons (16.3%) did not have a specific opinion on the matter; 16% of respondents (41 persons) mostly disagreed with this claim, whereas 27 respondents (10.5%) strongly disagreed.

**Table 3.** Descriptive statistics for the chosen items.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
		Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
I spend more money on dietary supplements than usual during the pandemic	257	4	1	5	3.41	0.093	1.495	2.235
My usage of dietary supplements was greatly influenced by the COVID-19 pandemic	257	4	1	5	3.24	0.093	1.494	2.231
The COVID-19 pandemic made me fear for my health	257	4	1	5	3.83	0.083	1.327	1.760
The COVID-19 pandemic made me fear for the health of my loved ones	257	4	1	5	4.32	0.066	1.054	1.110
The COVID-19 pandemic made me fear death	257	4	1	5	3.40	0.085	1.357	1.842
The COVID-19 pandemic made me feel powerless regarding matters of my own health	257	4	1	5	3.14	0.075	1.196	1.431
The COVID-19 pandemic made me feel indifferent toward matters of my health (I do not care whether I get sick)	257	4	1	5	1.86	0.078	1.258	1.582

This analysis shows that the majority of the respondents used dietary supplements to a greater extent than usual, as the sum of the respondents who strongly agreed and mostly agreed with this claim amounts to 57.2%, which is more than half of the total number of respondents. This matter is extremely important to the research as it demonstrates a change in consumer habits and behaviors toward dietary supplements during the pandemic, i.e., it shows that the consumers have started purchasing and using this category of products to a greater extent than usual.

The results pertaining to the claim that “I am using dietary supplements to a greater extent than usual during the COVID-19 pandemic” are visible in Table 3. The results are as follows:  $\sigma$  or the average mean square deviation of the numerical values equals 1.409; whereas the arithmetic mean equals 3.60. In all, 35% of the respondents (90 persons) strongly agreed with the claim that they have been spending more money than usual on dietary supplements, 19.1% of the respondents (49 persons) mostly agreed with said claim, 13.6% (35 persons) did not have a specific opinion on the matter, whereas 42 respondents (16.3%) mostly disagreed and 41 respondents (16%) strongly disagreed with the aforementioned claim.

This analysis shows that 139 respondents, i.e., 54.1% out of the total 257 respondents, claimed to mostly or strongly agree with the claim in question, which proves an increase in dietary supplement consumption, as well as in funds allocated to purchasing the said supplements during the pandemic.

Results pertaining to the claim that “I spend more money on dietary supplements than usual during the pandemic” are shown in Table 4. The results are as follows:  $\sigma$  or the average mean square deviation of the numerical values equals 1.495, whereas the arithmetic mean equals 3.41. 72 respondents (28%) strongly agreed with the claim that their consumption of dietary supplements was influenced by the pandemic; 58 respondents (22.6%) mostly agreed with said claim, 37 persons (14.4%) did not have a specific opinion on the matter and 15.6% of the respondents (40 persons) mostly disagreed with it; 50 respondents (19.5%) strongly disagreed with this claim. This analysis shows that the majority of the respondents (130 persons or 50.6%) strongly or mostly agreed with the claim that their consumption of dietary supplements was influenced by the COVID-19 pandemic. On the other hand, 90 respondents (35.1%) mostly or strongly disagreed with this claim.

**Table 4.** ‘Low levels of fear of the COVID-19 infection and its influence on consumption of dietary supplements’ Hypothesis Test.

Z-Test of the Hypothesis on Levels of Economic Possibility and Influences	
Hypothesis 0 <i>p</i> -value	0.90
Significance Level	0.05
Number of responses about low levels of economic possibility	782
Sample proportion	0.9524
Standard error Test size Z	
Upper critical value	1.6449
<i>p</i> -value	0.9263
<b>The hypothesis is confirmed</b>	

Previous analysis shows that 60.7% of the respondents (156 persons) used to consume dietary supplements periodically/seasonally before the pandemic, 15.6% (40 persons) used dietary supplements often, i.e., every month/all year long, whereas 23.7% of the respondents (61) did not use dietary supplements at all before the pandemic and 54.5% of the respondents (140) have already used dietary supplements prior to the start of the pandemic. Results pertaining to the claim that “My usage of dietary supplements was greatly influenced by the COVID-19 pandemic” are as follows:  $\sigma$  or the average mean square deviation of the numerical values equals 1.494, whereas the arithmetic mean equals 3.24.

The initial hypothesis refers to low levels of fear of the COVID-19 infection and its influence on the increased consumption of dietary supplements during the pandemic. Ho ...  $p \leq 0.90$ ; H1 ...  $p > 0.90$ . ... ; ... ,  $\leq >$ . With the significance of 5% and the *p*-value that equals 0.9263, the hypothesis has been confirmed, i.e., it has been determined that the respondents recognized a correlation between the emotion of fear and its influence on the increased consumption of dietary supplements. In this paper, the emotion of fear was regarded as the initiator of the increased usage of dietary supplements. The purchase of dietary supplements included both objective factors and the subjective assessment of physical, material, social and emotional elements pertaining to health preservation, which are closely related to the consumption of dietary supplements and act as agents of health preservation. Regarding matters of interconnection between the objective and subjective indicators, a weak correlation was observed between a person’s subjective feelings of fear, their own assessment of the chances of getting COVID-19 and their objective living conditions (an increase in the count of sick people, an increase in the number of the deceased, etc.).

To determine the association of an increased consumption with fear assessment as a drive for the increased consumption of dietary supplements during the COVID-19 pandemic, the Pearson correlation coefficients were calculated. Since the distribution of self-assessments of the increased consumption of dietary supplements and the fear of infection and disease are asymmetric, the Spearman correlation coefficients are calculated, which are very similar to the Pearson correlation coefficients and are shown in Table 5. The results of correlation analysis support good criteria validity. Although the obtained correlations are not high, they are statistically significant and are in the expected direction, ranging from 0.15 to 0.30. Respondents with higher consumption of dietary supplements also had a higher fear of infection, which suggests that fear is the motivator of increased consumption of dietary supplements. In addition, respondents in such an environment of high risk of infection do not feel safe, as indicated by the relatively low but statistically significant correlation between assessing the security of respondents during a pandemic and their



assessment of their own fear. Respondents who assessed a lower level of security at the time of the pandemic also assessed fear as an emotion that makes the situation more negative.

**Table 5.** Relationships of self-assessment of the impact of fear on patterns of behavior at the time of COVID-19 with variables of purchase of dietary supplements on the total sample (N = 257), male and female subsamples (NM = 104; NF = 153) and subsamples up to 35 years of age (N up to 35 years of age = 105) and after 35 years of age (N after 35 years of age = 152).

	Lockdown		Consumption	
	Pearson Coefficient	Correlation	Fisher's z Test Difference in Correlations	Spermanov Coefficient Correlations
Buying dietary supplements		−0.155 **		−0.149 **
Men Women	−0.179 **	−0.111 **	z = 1.02	
to 35 after 35 years years	−0.134 **	−0.123 **	z = 0.16	
A sense of security for Health Pandemic		−0.147 **		−0.133 **
Men Women	−0.141 **	−0.169 **	z = 0.41	
to 35 after 35	−0.160 **	−0.176 **	z = −0.24	
Self assessment of "Lockdown"		0.273 **		0.299 **
Men Women	0.289 **	0.288 **	z = 0.02	
to 35 after 35	0.348 **	0.253 **	z = 1.53	
Self assessment of fear of infection		0.293 **		0.305 **
Men Women	0.217 **	0.329 **	z = 1.78	
To 35 after 35	0.291 **	0.285 **	z = 0.10	

Note \*\*  $p < 0.5$ .

Further research has proven that this correlation isn't linear, which indicates an interconnection of subjective and objective indicators in extraordinary circumstances and situations of fear and panic, circumstances in which basic human needs are not met and social contact is kept to a minimum. Once the objective living conditions have improved, and the number of the infected and the deceased has decreased, the quality of life will increase and people will be able to socialize more. Table 6 displays the statistical significance of the structural coefficient, which indicates confirmation of the set hypotheses. Considering the obtained *t*-test values (H1 = 4.515, H2 = 3.467, H3 = 4.183 and H4 = 4.253), the set hypotheses are herewith confirmed.

**Table 6.** Statistical significance of the structural coefficient between high levels of fear, risk perception and consumer behavior toward the purchase of dietary supplements during the COVID-19 pandemic.

Hypothesis	Relation Direction	Standardized Assessment (Beta Coefficient)	Standard Error	t-Value	p-Value	Hypothesis Confirmed
H1	Emotion of fear → Initiator of dietary supplement purchase	0.392	0.127	4.515	0.00 **	YES
H2	Emotion of fear during lockdown → Initiator of dietary supplement purchase	0.385	0.104	3.467	0.00 **	YES
H3	Attitude toward prominent consumption of dietary supplements → Positively correlated with the fear of the COVID-19 infection	0.326	0.071	4.183	0.00 **	YES
H4	Linear combination of variables (fear of the disease, fear of death or infection) → A significant increase in consumption of dietary supplements during the COVID-19 pandemic	0.319	0.137	4.253	0.00 **	YES

Note \*\*  $p < 0.001$ .

## 5.2. Limitations of Research and Contribution of Authors

This research deepens the knowledge about the impact of the emotion of fear and the purchase of dietary supplements (vitamins and minerals). The results of the research show

that consumers' tendency to buy a dietary supplement will be higher the more they are prone to feelings of fear. As the number of new cases of infection increases or decreases, so does the intention to purchase a dietary supplement. The panicked accumulation of stocks of products for everyday use is one of the first reactions of people to emergencies with an uncertain future. Furthermore, one of the first changes in customer behavior is to postpone the demand for products such as travel, cars or real estate, or to leave the demand for these products for some future time. The delay in demand is also visible in the services of recreation, sports or going to a concert. Furthermore, the same research points to the fact that to maintain health, consumers are more inclined to buy dietary supplements, their consumption is more thoughtful and they focus on meeting essential needs and on their own health. When considering the results of this research, it is important to keep in mind that there are certain limitations. First, the research was conducted in the city of Zagreb, which, in addition to the COVID-19 pandemic, suffered a major earthquake in the same period. Also, this research is based on a survey. Although this research methodology has its advantages, to have a more detailed insight into the cause-and-effect relationships among the researched variables, it would be necessary to conduct a series of experiments. Despite these shortcomings, the research results provide important implications for theory and practice.

First of all, it should be noted that there are not many studies that have dealt with this topic, which significantly affects the conceptualization, but also the setting of hypotheses and the overall design of the research. Furthermore, there are concepts (e.g., socialization of emotions, socialization of fear as emotions) that are only superficially included in this research, and could contribute to a better understanding of differences in the acceptability of emotions, pandemic experiences and feelings that define behavior. Given the fact that the resulting models of predictors of the acceptability of expressing emotions during a pandemic are very weak, it can be assumed that by including other concepts of feelings the image would look different. In this study, a deliberate sample of 257 respondents was used, which is a relatively small sample, so it should not be inferred about the proportions of individual findings, but it can still be used to determine the relationship between different phenomena. But it should be noted that the findings about how the emotion of fear is most acceptable are tied solely to our pattern and should not be generalized. The findings of this study need to be further investigated on a larger and possibly probabilistic sample of the general population. Furthermore, due to the lack of similar research, most of the instruments used were constructed by the authors themselves, which is both a contribution of research, but also a limitation since their validity cannot yet be assessed.

## 6. Conclusions

Fear is the primary emotion that inevitably belongs to every human being, accompanying him from birth to death. It arises from the experience of a threat, physical or mental, that endangers our lives in various ways. According to the results of research at the time of "lockdown" (average score = 4.26 and standard deviation 0.865 and a relative standard deviation of 22.3%), the consumer was structurally exposed to the fear that is present in the threat of imminent infection. Apparently, the fear of infection with COVID-19 is at the root of all humans, i.e., consumer conscious and subconscious fears and anxieties that affect the purchase, but at the same time it can be a useful mechanism that keeps us from experiencing death before it comes. Fear at the time of the pandemic, according to respondents, has its cause in existential insecurity and imbalance, and respondents rated this construct (average score = 4.57, standard deviation 1.41 and a relative deviation of 21.8%). Furthermore, for the purposes of this paper, fear was defined as an intense and uncomfortable feeling about the existing or some expected danger of COVID-19 that causes increased consumption equally in women and men. The threat and danger of coronavirus infection is perceived to be higher than other infectious injections and epidemics, such as the seasonal flu epidemic, which respondents did not attribute as a problem of infection. Therefore, it is important to look at the characteristics of the threat of coronavirus infection because the specific

characteristics of the threat increase the emotional response and experience of risk and danger and increase the consumption of dietary supplements. This is supported by the fact that 62.65% of respondents said that they increased the use of dietary supplements compared to the period before the pandemic. As many as 172 subjects began active vitamin D intake with the onset of the COVID-19 pandemic. The severe clinical picture was an independent factor associated with the consumption of dietary supplements. Respondents who used dietary supplements both for prevention and as adjunctive therapy were more likely to increase their consumption of dietary supplements, although the majority of respondents stated that they used dietary supplements for prevention purposes. Research has shown that during the pandemic, respondents generally changed their lifestyle for the better, i.e., increased physical activity and paid attention to diet and increased the use of dietary supplements. Respondents who believed that supplementation contributes to both prevention and the clinical picture used dietary supplements more and one of the main reasons for the increased use of dietary supplements is the subjective feeling of calm that their use brings. Therefore, although there is no solid clinical evidence that classifies dietary supplements as official guidelines for the prevention and treatment of COVID-19, the psychological effect they have on the user, together with the safety profile and availability of the drug itself, is a benefit and motivation to consume. The COVID-19 pandemic has caused many changes in normal day-to-day life. The new security measures and the lockdowns have been a real turning point in life as we know it. Along with the various measures, a reign of fear began—fear of the unknown, fear of the infection, fear of the disease, and fear of death. In these new circumstances, with the end of the pandemic nowhere in sight, the emotion of fear has greatly altered people's behavioral and purchasing patterns. The pandemic caused fear, which in turn encouraged people to focus on their health. Consumers started contemplating ways of strengthening their immune systems, and often turned to dietary supplements because of their numerous and well-known health benefits. Modern consumers are well-informed and know what they want. One might say that their cognitive development regarding the process of purchase decision-making has increased, probably because of the overall availability of information. However, even though the consumer understands, evaluates, plans and contemplates more than ever before, affective factors such as emotions still play an important role in human behavior and the purchase decision-making process. Emotions have been passed down to humans as a part of their evolutionary heritage and enabled their ancestors' survival tens of thousands of years ago. The human emotional system has the same role today as well—it helps humans face obstacles and make the best possible decisions to make the increasingly taxing day-to-day life a little bit easier. Emotions are often the initiator and the trigger for many different actions, such as deciding on a purchase. This has been especially evident during the pandemic. This research has shown that the emotion of fear initiated the changes in consumer behavior toward dietary supplements during the COVID-19 pandemic.

In these modern times, people are more influenced by external stimuli than ever before. The socio-economic environment, ecological factors, and a person's own day-to-day life all play a significant role, whereby factors on the inside, such as emotions, greatly influence the way people react to external stimuli. This is why internal factors such as emotions should not be neglected or overlooked in any aspect of our lives.

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