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Subye: A Traditional Melon Seed Sherbet with Nutritional Value and Its Potential in Gastronomy Tourism

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Abstract

Turkish food culture has great importance in world culture. From Ottoman cuisine to Turkish cuisine traditional beverages culture has been moved. There is also a melon seed sherbet which is among the traditional drinks but has lost its importance. In the scope of culinary tourism, which can not only ensure the transmission of cultural data from the past to the future but also create financial income, is an interesting concept that involves many ingredients in the new industrial climates and the spreading international travel concept in the countries. In this study, because of being a drink with alternative and gastronomic value, analyzes were made to determine the nutritional content and value of sübye, which is locally produced in Izmir and supplied from public sales area. In study, we determined that the values of moisture, protein, ash, fat and sugar were 89.58%, 0.99%, 0.16%, 1.68% and 7.59%, respectively. The values of mineral content are magnesium 6.0 mg/100 g and iron 0.4 mg/100 g. Arsenic in the beverage was not detected. It has been found that with the high protein and low fat content of the sübye, it can be seen as a healthy and alternative drink which can be consumed by each age group. In terms of gastronomy tourism and sustainability, sübye stands out as a cultural beverage that can play a key role in both preserving traditional culinary heritage and offering a unique, health-conscious option in the modern food and drink market, making it an attractive feature for culinary tourism.

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INTRODUCTION

Turkish cuisine is rich in Black Sea, Aegean, Mediterranean, Anatolian and Mesopotamian cuisine (Sarıoglan & Cevizkaya, 2016). The variety of products in Central Asia and Anatolia contributed to the diversity of these cuisines and the development of new flavors. These new tastes, from time to time in the Selcuk and Ottoman palaces with the interaction of various cultures has enabled the enrichment of Turkish cuisine (Hatipoglu & Batman, 2014). The flavors of these cultures were produced by growing different crops in different regions and using these products in different foods and beverages. In addition to the rich variety of Turkish cuisine, it includes different traditional beverages. Milk, ayran, boza, salep, compote and sherbet are among the beverages transferred from Ottoman cuisine to Turkish cuisine (Özdogan & Isik, 2008; Kaya, 2011).

Because food is a necessity of life, it is an integral part of the vacation experience in which tourists take part regardless of their motives and tourist activities. In recent years, food and beverages has become the ideal indicator of tourism consumption. Today's tourist has a structure that likes to adapt to the culture of the region they visit and wants to see and experience all the elements of the culture (Cömert & Özkaya, 2014). In a changing and evolving tourism industry, tourists are increasingly interested in consuming the characteristic dishes and food products of the region they are visiting. For this reason, in recent years, many touristic destinations have started to focus on their food and cuisine in the promotion of their regions and have started to use their culinary culture as an important element and attractive factor in their promotion (Kivela & Crotts, 2005).

Gastronomy tourism is defined as a type of tourism that aims to get to know the local cuisine culture, to taste a local flavor, to see the cultivation and collection of products belonging to the geography of the region, to get to know the folkloric tools and equipment of the kitchen, and to eat the food of famous restaurants (Şengül & Türkay, 2016). Wolf (2002) defined gastronomy tourism as traveling in search of and enjoying prepared food and beverages, unique and unforgettable gastronomic experiences. With this definition, we can clearly say that when we talk about gastronomy, we focus not only on food but also on drinks. It is possible to define Turkish cuisine as the food and beverages that provide nutrition for the people living in Turkey, the preparation, cooking and preservation of these foods and beverages, the tools and techniques necessary for these processes, the manners of eating and all practices and beliefs that develop within the framework of the kitchen (Seyitoğlu & Çalışkan, 2016).

In this study, it was aimed to determine the gatronomic value of the sübye in Turkish cuisine and to emphasize its importance as a gastronomy tourism attraction. In the research part of this study, the raw materials required for the production of sübye were obtained from melon species cultivated in Manisa, and laboratory analyses were conducted to determine the quality of the product. As a result of the analyses, the moisture, protein, fat, sugar, and mineral contents of the sübye were determined, highlighting its potential as a healthy alternative with significant relevance in gastronomy tourism.

2. CONCEPTUAL FRAMEWORK

2.1. Sherbets And Gastronomy Tourism

Recently, the benefit that culinary offerings hold for tourism has been highlighted: gastronomy is identified as a pull factor in increasing the desire to visit a different region or country. However, there can be other products and services that serve to enhance a tourism destination, thus creating enhanced interest, experience, and logical economic returns; such are the cases of religious expressions, tastes, cultural creations, or food with its peculiarities of preparation, mixture, or consumption.

The commonly used term “gastronomy tourism” is defined as “the search for a unique eating and drinking experience”. Gastronomy tourism often refers to the authenticity of a dish and its authentic connection to a place, region or country (Cunha, 2018). While research suggests that leisure travelers consciously and actively participate in a variety of food and beverage experiences, food and beverage travel is more than a “niche” activity (Stone & Migacz, 2019). Consumption of food is often seen as an important element in the growth of marketing in a particular area and as a catalyst for showcasing local ingredients (UNESCO National Commission, 2013). Nevertheless, beverages have a significant impact on tourists' gastronomic tourism experiences (Yayla et al., 2020). Gastronomy tourism makes significant contributions to the development of the local economy in the regions where it develops. It is known that gastronomy tourists prefer local products more, especially their tendency towards local food and beverages is higher than other types of tourists (Erciyas & Yılmaz, 2021). In recent years, cooking methods with local products have become important for destinations and food and beverage businesses, traditional dishes have started to be in demand within the scope of gastronomy tourism. It is seen that customer expectations tend towards exotic and nostalgic dishes according to regions (Sahin & Ünver, 2015).

Sübye has an important place in terms of gastronomy tourism as one of Turkey's traditional drinks. This cold drink prepared with melon seeds, sugar and water attracts attention with its flavor and health benefits. In Özdemirli and Kamiloglu's study, research on the bioaccessibility of the phenolic components of milkweed beverage reveals the

health potential of this beverage (Özdemirli & Kamiloglu, 2022). In this context, more than just being a beverage, it attracts the attention of tourists by offering a local, healthy and authentic experience within the scope of gastronomy tourism. Sherbets and, specifically, the sübye drink are among the flavors that constitute the gastronomic identity of İzmir Cuisine (Erdoğan & Özdemir, 2018; Altıntaş & Hazarhun, 2020; Yıldız, 2020). Studies have shown that gastronomy routes that emphasize local food and beverages specific to the region have positive effects on the development of gastronomy tourism in the region (Altıntaş & Hazarhun, 2020; Köseler et al., 2019).

It has been determined by studies that food and beverages reflecting the gastronomic identity of destinations increase the attractiveness of the destination within the scope of gastronomy tourism and play an important role in its promotion, contribute to the survival of cultural heritage and the development of sustainable tourism (Derinalp Çanakçı et al., 2015; Onur, 2021). Food functions not only as a means of nutrition but also as a part of cultural identity. In this context, gastronomy tourism enables tourists to interact with local culture and identity, and this interaction offers an enriching experience for both tourists and local people.

2.2. Gastronomic Importance of Sherbet

The sherbets are drunk to satisfy thirst and also alongside meals. Turks made beverages, both with and without alcohol. Afterward, fruit juices and fizzy beverages, which were also known as sherbet, were served. Up until the 20th century, sherbet was a highly popular drink in the Middle East and Asia. The sherbet culture is prevalent in the Eastern Arab region. Sherbet was identified by Muslim Arabs through trading and expeditions. Arabs are acknowledged for their important role in creating a new cultural identity through the production and serving of sherbet in various parts of the world. Sherbet became popular in the West during the time of the Ottoman Empire (Bilgin, 2012). The Turks in the Ottoman Empire invented the sherbet. According to Haydaroglu (2003), a classic drink made from fruit juices is customarily made at the palace and can be enjoyed at all hours of the day. Sherbet, being both significant and tasty, was a customary treat for visitors in all households according to Badifu (1993).

It was set up in the Ottoman palace for the purpose of making helvahane, sherbet, and desserts. Helvahane used to be called sherbet in the past (Gürsoy, 2004; Kut, 1999). The housewives in the houses made the sherbets. During that period, sherbet was readily available in the majority of households. Typically during the summer season, sherbet could be purchased at confectionery stores and pastry shops. A large amount of ice was put into the containers they used to maintain the sherbet's cold temperature. Street vendors are also recognized for vending sherbet (Ozdogan & Isik, 2008). Sherbets can be enjoyed as refreshing drinks at any time of the day. These drinks can be provided alongside the food (Inaltong, 2016). Sherbet was popular before tea and coffee became common drinks.

2.3. Types of Sherbet

It is the overall concept of sherbet created by mixing various influences from imperial cuisine to Turkish cuisine. Sherbet is described as yeast in liquid form created by mixing sugar with water. Sherbets can be likened to sugar water, also known as sugar syrup or simple syrup. Another way to define it is drinks made by mixing sugar with different types of seeds, fruits, plants, flowers, and roots. Flowers are utilized for enhancing the taste and appearance of fruit sherbet (Oğuz, 2002). There are two ways to make traditional sherbets. The initial technique involves pressing the fruit to extract the juice, then mixing in sugar. The other option involves combining the fruit with sugar, then mixing in water. The sherbet made using the initial procedure has a longer shelf life. The second technique produces sherbets that are not liquid and have a dark color. Beverages can be thinned out by mixing them with cold water until the desired texture is reached. Both techniques involve letting the sherbets cool before they are eaten (Savkay, 2000).

Ottoman cuisine offers a variety of sherbets made from a range of fruits and plants. Sherbets made from flavors such as strawberry, tamarind, mulberry, cranberry, rose, melon seed, apricot, carob, cranberry, raisins, almond, orange, peach, cinnamon, citrus, grape, lime, and lily are mentioned in the study by Gürsoy (2004). It is common knowledge that sherbets are typically enjoyed alongside a meal. Still, there are sherbets that offer significant advantages for your health. Tamarind sherbet positively impacts health by maintaining the functions of blood, digestion, and the intestinal systems (Sarıoglan & Cevizkaya, 2016). Cinnamon sherbet is known for its antiseptic properties and its ability to protect the skin (Gurson & Ozcelikay, 2005). Postpartum syrup, administered to the recently delivered mother. This sherbet is used by postpartum women to fulfill their fluid and energy requirements (Bolsoy & Sevil, 2006). Carob syrup has the potential to alleviate breathing difficulties and asthma symptoms. (Batu, 2011). Licorice sherbet, a popular drink in Adana and its surrounding areas.

2.3.1. Sübye (Melon Seed Sherbet)

The sherbet culture is observed across a vast geographic region. Numerous types of sherbets were made in these regions. Fruit, spices, nuts, and other ingredients are commonly utilized in the preparation of sherbet (Sarıoglan & Cevizkaya, 2016). We make and drink our beverages locally, all the while keeping traditional techniques intact. Presently, there are various kinds of beverages alongside Turkish cuisine. The melon seed sherbet, also called a sübye, is among these drinks.

Sübye is a classic chilled beverage made from dried melon seeds. One of the alternative names for Sübye is Izmir sherbet. There are multiple speculations regarding the source of the sübye. This drink is unfamiliar in the provinces near Izmir. Around 500 years ago, Jews from Spain introduced this drink to Izmir when they immigrated. Sübye was recognized as a descendant of the Jewish community that established roots in the Tire Region of Izmir. Therefore, the crayon, or melon seed sherbet, is a custom practiced by residents of Tire, Bergama, and Milas (Savkay, 2000; Kavroulaki, 2017). Sübye is made up of water, sugar, and melon seeds (Badifu, 1993). The seeds of the melon can be utilized for either fresh or dried preparations. The formula changes depending on various sources. Therefore, both use melon seed extract. First, the seeds of the melon are cleaned. Then, water is added and the mixture is pounded thoroughly in the mortar. Next, the melon seeds are blended together and then strained. If needed, dilution can be achieved through performing the filtration process again. The mixture of sugar is added to the filtrate to create a drink. Prepared melon seed water that is filtered and clear is ready to be served (Tosun, 1998).

An alternative way to make the melon seed drink is to dry the melon seeds beforehand. The dried melon seeds are left in water at room temperature for about 30 minutes on average. A specific amount of sugar and water is then included. The blend is homogenized for approximately 2 minutes before being strained. The mixture of filtrate and water is stirred before undergoing another round of filtration. The solution is gathered to produce the sübye beverage (Karakaya et al., 1995).

Since melon seed, which is food waste, is used as raw material in the production of sübye, the sübye are also important in economic and environmental terms (Badifu, 1993). Melon seeds are often used as nuts, flavor and thickening products (Akubor, 2003). Food production from food waste is important due to the decrease in natural resources. Melon seeds, which are accepted as food wastes, have been used in the health field since Ottoman times. The health benefits of melon seeds have been reported in the treatment of eczema (Sabancı et al., 2014). The sübye is also used as an alternative medicine. It is known to drink to provide good sleep and to regulate the digestive system (Sarıoglan and Cevizkaya, 2016). For underdeveloped or developing countries, research has been conducted on the search and development of alternative dairy products. These investigations are carried out because of insufficient milk sources, dietary preferences and allergic conditions. Vegetable sourced dairy products which are generally produced and consumed in the world are soy, almond, rice and coconut milk. In a study conducted on melon seed milk, protein value was found to be 3.6% and fat value was 4%. With the obtained values, it was observed that the sübye would be an alternative beverage to soy (Bastıoglu et al., 2016). Some researchers studied the makeup of entire melon seeds. The most significant findings showed that moisture, oil, protein, carbohydrate, fiber, and ash contents were 7.78%, 35.36%, 29.90%, 22.94%, 23.30%, and 4.20% respectively, varying according to the types of melon (Lazos, 1986; Mello & Narain, 2000; Tekin & Velioglu,1993; Mian-Hao & Yansong, 2007; Yanty et al., 2008). Because it is a plant-based milk that is rich in nutrients, it can be a suitable option for people who are lactose intolerant or following a vegan diet. In this research, sübye, a locally produced drink in Izmir with alternative and gastronomic worth, was analyzed to assess its nutritional content and value from public sales outlets.

3. MATERIAL AND METHODOLOGY

3.1. Material

Raw materials required for production are obtained from melon seed, sugar market. The melon core, the main component of the primer, was obtained from the melon species (Cucumis melo subsp. Melo) grown in Manisa and the melons were obtained from local markets.

3.2. Obtaining the Melon Seed Beverage

The melons are cut, the seed are removed and washed. The melon seeds were then roasted in the sun, in the oven or on the stove and dried in 3 different ways. As a result of preliminary tests, proper drying technique was determined as drying in oven (2 hours at 650C). High dry matter ratio and desired odor-taste were determined in the drying method. The formulation of the product was determined by optimization. Add some water to 30 g of melon seeds and mix in a blender. 30 g sugar was added to the mixture by adding 150 ml of water. Blender blending continued for 2 minutes to make the mixture completely homogeneous. The slurry was filtered 2 times successively through the filter. The supernatant was collected in one place to obtain a sübye drink.

3.3. Method

Analysis of energy, moisture, protein, ash, fat and sugar were performed in the sample. In addition, iron, magnesium, arsenic analysis and metal-mineral content of the drink are determined. Moisture content analysis was determined according to the TS 1129 ISO 1026 -Turkish Standards Institute method (TS, 1998). The principle of the method is to keep the liquid or semi-liquid products which have spread on an absorbent surface after mixing thoroughly at 70 ° C until a fixed mass is obtained in an application with low pressure. The amount of protein in the sübye was determined by the AOAC 2001.11 - Kjeldahl method (AOAC, 2001). The total amount of ash in the beverage was worked according to AOAC 900.02 A method (AOAC, 1900). The principle of the method is the expression of the mass

percentage of the residue obtained by burning the analysis sample at 525 ° C. Fat analysis was carried out by the TS 7437 - Turkish Standards Institute method (TS, 1989). The method is to determine the amount of fat by taking advantage of hydrochloric acid in the fluid. The sugar analysis was determined by titrimetric method according to TS 1466 - Turkish Standards Institute (TS, 2020). The energy value of your drink is calculated using moisture, protein, ash and fat. Microwave combustion was used in iron and magnesium analyzes of mineral substances and arsenic analysis of metal contaminants. The analysis was determined by the ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrophotometer) technique and NMKL 161 method (NMKL, 1998).

4. FINDINGS AND DISCUSSION

As a result of our study, we determined that the values of moisture, protein, ash, fat and sugar were 89.58%, 0.99%, 0.16%, 1.68% and 7.59%, respectively. Calculation of the energy value by using data obtained by analyzing 49 kcal. The values of mineral content are magnesium 6.0 mg/100 g and iron 0.4 mg/100 g. Arsenic was analyzed to detect pesticide contamination that could be caused by melon fruit, and arsenic in the beverage was not detected. Research has also found out the levels of energy, moisture, macronutrient (Table 1.) and micronutrient contents (Table 2.) present in the melon seed beverage that was produced.

Melon seeds are particularly crucial in the diet of individuals who are trying to lose weight. Due to the high protein, fat, and mineral content in melon seeds (Sobowale et al., 2015). A study on the nutrient content of sübye revealed it contains iron, magnesium, and protein. A research on melon seed found that it contained 37.8% fat, 25.2% protein, and 15.4% fiber. The quantity of methionine and cysteine amino acids in the sübye was said to exceed that found in soybean. Furthermore, melon seeds are rich in potassium, phosphorus, and magnesium minerals (Lazos, 1986). In a study that resembled ours, the values for moisture, fat, protein, ash, and carbohydrate were reported as 86.36%, 1.92%, 1.28%, 0.27%, and 10.2% respectively. The results yielded an energy value of 67 kcal when calculated. Researchers found that the mineral content (mg 100 g) included magnesium at 22, iron at 0.90, and no arsenic was detected (Karakaya et al., 1995). The energy and nutritional values of sübye are shown in Tables 1 and 2.

Table 1: Energy and Macro-Nutrient Contents of Sübye

Component	Sübye
Energy (kcal/100 g) Energy (kj/100 g)	49 205
Moisture (%)	89.58
Fat (%)	1.68
Protein (%)	0.99
Ash (%)	0.16
Carbohydrate (%)	7.59

Table 2: Micro-Nutrient Contents of Sübye

Micro-nutrient	Content (mg/100 g)
Magnesium	6.0
Iron	0.4
Arsenic	-

Melon seeds were discovered to have about 30-40% fat, 15-25% protein, 15% fiber, as well as potassium, calcium, magnesium, iron, copper, zinc, phosphorus minerals, and vitamins B and C. The energy content was determined to be 2.5 megajoules per 100 grams. The values mentioned may differ based on the type of melon (Lazos, 1986; Mello & Narain, 2000). In a study conducted in Turkey, the fat and protein content of melons harvested from seed was found to be 33.23% in Manisa (Kırkağaç) and 24% in Denizli (Tavas) (Tekin and Velioglu, 1993). In various studies, Cucumis melo seeds were found to have highest values of 30.8% fat and 14.9% protein. Mello and Narain (2000) determined the presence of linolenic acid at 64.1%, oleic acid at 19.4%, palmitic acid at 9.5%, stearic acid at 4.9%, and small amounts of arginine, aspartic acid, glutamic acid, methionine, and lysine in the sample.

In a different study conducted with Cucumis melo var saccharinus seeds, it has been reported that it contains 32.3% fat and 19.3% protein. Fatty acid content of the same study showed parallelism with the other study, linelonic acid value 51%, oleic acid value 31%, palmitic acid value 8.5%, stearic acid value 6.1% arginine value 13.4%, aspartic acid value 8.9% and glutamic acid value was found to be 19.7% (Mello et al., 2001).

Not many studies have been found on prolonging the shelf life of sübye. Experiments were conducted in the initial study to create a blend of melon seed milk and banana puree. 16% of banana puree was the quantity determined for use in the study. Part of the beverage that was ready was processed at temperatures of 85°C, 100°C, or 121°C for a duration of 15 minutes. The additional portion was mixed with citric acid, sodium benzoate, and then pasteurized at 85°C for 15 minutes. The beverages were kept at a temperature of 30 ± 2°C for a period of 50 days. At the conclusion

of the storage period, melon milk and banana blended drinks were found to have satisfactory qualities based on assessments of their physicochemical, microbiological, and sensory characteristics. No bacteria were found in drinks treated with pasteurization combined with sodium benzoate. Plate counts in beverages treated at 121°C for 15 minutes were below 50 cfu/ml after 50 days of storage. There were no noticeable differences in the levels of vitamin C, soluble solids, titratable acidity, and pH values of the sübye product after undergoing processes to extend its shelf life. Using sodium benzoate and heat treatment together helped the beverage stay acceptable for 35 days, while beverages processed at 121°C for 15 minutes could stay acceptable for up to 12 days (Akubor & Ogbadu, 2003).

Second experiment, sübye was reached by adding a mixture of xanthan gum and guar gum (0.04 %:0.5 % and 0.05 %:0.4 %) after one day of storage. The gum-containing samples did not show any major variations compared to the control samples in terms of Hunter color values and sensory attributes like mouthfeel, taste, and overall acceptability (excluding appearance). After 6 days of storage, the combination of nisin (2 ppb) and natamycin (30 ppm) was determined to be the most successful antimicrobial treatment for aerobic mesophilic bacteria. The most effective antimicrobial combinations for mold and yeast count after 3 days and 6 days of storage were found to be nisin (2 ppb), natamycin (30 ppm), nişin (2 ppb), and potassium sorbate (250 ppm) (Apan & Zorba, 2018).

CONCLUSION

The variety of Turkey's geographic characteristics has diversified Turkey's potential for gastronomy and increased the added value of gastronomy products. In this respect, it is thought that Turkish cuisine has an important place in making destinations more attractive as a touristic product and should be used. Each region has its own unique dishes and rich culinary culture. Foods and beverages, especially those transferred from the past to the present, result in significant attraction in the tourism market. For developing countries, gastronomy tourism is seen as an important marketing tool. Considering the direct or indirect effects of gastronomic activities on destinations, countries strive to gain a share in gastronomy tourism by using the values they have and carry out many publicity activities.

In Ottoman Palace cuisine, the majority of beverages such as sherbet and syrup were frequently enjoyed. In the current Turkish culinary scene, sherbet and syrup are hardly ever consumed. The popularity of acidic drinks has caused sherbet and syrups to become less important. Fizzy beverages in Turkish cuisine are blamed for affecting eating habits and health due to the negative impacts. Sherbets should be re-introduced and to preserve traditional drinks and offer non-acidic options alongside other beverages.

Many studies have been conducted on the nourishment and the nature of the sübye, which has come from the Ottoman palace to the present day. However, there is no study on the historical, cultural and gastronomic characteristics of the sübye. We have conducted studies to determine the nutrient content of the sübye and other data on several studies have been evaluated. As a result of the studies, it has been found that the sübye contains high protein, low fat and it can be regarded as an alternative beverage. It is important to note that sübye is a drink unique to Izmir which is consumed and produced only in and around Tire. It would be beneficial to carry out studies to increase the consumption, quality and shelf life of the beverage. The sübye require a longer shelf life and durable packaging materials to be manufactured and sold on an industrial scale. The nutrient-rich sübye can be made available to all age groups as an alternative beverage.

In our study, melon seed milk drink was obtained from melon seeds which are considered as waste. It has been observed that this beverage can be consumed as an alternative vegetable milk with protein, fat values. It has been evaluated that dairy is a beverage which is easy to consume and nutritionally acceptable levels especially for vegans and people with allergic condition. In addition, it is possible to use the traditional beverage to promote Izmir culture to increase its attractiveness as a target. Izmir and its surroundings are considered intriguing for tourists seeking new experiences and flavors. It is crucial to strike a delicate balance when promoting a region's cuisine through its local and regional dishes. Food service providers should promote and brand the local and special products of that region. This requires a joint effort by all stakeholders in the destination. It is necessary to create a sense of pride in local food and to develop a system of identification for locally produced food.

In summary, sherbet serves as a vital component of gastronomic tourism, intertwining cultural heritage, local agriculture, and economic development. Its production and consumption not only reflect traditional practices but also adapt to modern trends, thereby enhancing its relevance in contemporary tourism. The promotion of such beverages can lead to increased tourist interest and economic benefits for local communities. By using local dishes in tourism enterprises that accept guests on an international scale, the culture of the region can be promoted and contribute to the region becoming a center of attraction for a wider audience. In further studies, research can be conducted on the marketing of sherbets in tourism enterprises and touristic destinations.

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Ethical Approval

This study is among the studies that do not require ethics committee approval.

Researchers' Contribution Rate

The authors contributed equally to the study.

Conflict of Interest

There is no potential conflict of interest in this study.