PREVALENCE OF DISEASES: FINDINGS FROM THE SURVEY "ASSESSMENT OF THE CLEANLINESS OF LAKE AND MARINE WATERS AND THEIR PRODUCTS WITH IMPACT ON PUBLIC HEALTH" – SARANDA

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Abstract

The quality of surface waters is closely connected to the risk of various diseases that affect public health. Products from lakes and the sea—such as mussels, fish, and other aquatic organisms—can cause illness and foodborne poisoning if contaminated. Although efforts have been made to improve surface water quality in Albania, several areas still face problematic conditions, making these waters unsuitable for human use. This study is based on responses from the survey 'Assessment of the cleanliness of Ionian Sea water in Saranda and Butrint Lake (microbial quality of mussels) and its impact on public health,' interpreted through personal experiences and observations. Conducted from July 24 to September 24, 2025, it summarizes information from individuals regarding swimming in these waters, visits to the areas, consumption of lake and marine products (mussels, fish), and any subsequent illness symptoms. Among 100 respondents in Saranda, 22 locals and 56 tourists reported swimming in these waters, while 22 did not. Of those who swam, 20 reported illness and 17 experienced discomfort after consuming mussels. Although no definitive causal link is established, previous monitoring showed that microbial levels at some sites exceeded acceptable limits, and the summer rise in infectious diseases is suspected to be related to water exposure. These findings suggest a connection between swimming in surface waters—

both in Butrint Lake and along the Saranda coast (Ionian Sea)—and health-related symptoms, highlighting the need for further research to provide more precise assessments.

Key words: *Disease, mussels, public health, survey, surface waters.*

Përmbledhje

Cilësia e ujërave sipërfaqësore është e lidhur ngushtë me rrezikun e sëmundjeve të ndryshme që ndikojnë në shëndetin publik. Produktet që vijnë nga liqenet dhe deti—si midhjet, peshqit dhe organizma të tjerë ujorë—mund të shkaktojnë sëmundje dhe helmime ushqimore nëse janë të kontaminuara. Megjithëse janë bërë përpjekje për të përmirësuar cilësinë e ujërave sipërfaqësore në Shqipëri, disa zona ende përballen me kushte problematike, duke i bërë këto ujëra të papërshtatshme për përdorim nga njerëzit. Ky studim bazohet në përgjigjet e anketës "Vlerësimi i pastërtisë së ujit të Detit Jon në Sarandë dhe të Liqenit të Butrintit (cilësia mikrobiale e midhjeve) dhe ndikimi i saj në shëndetin publik", të interpretuara përmes përvojave dhe vëzhgimeve personale. Studimi u zhvillua nga 24 korriku deri më 24 shtator 2025 dhe përmbledh informacion nga individë lidhur me larjen në këto ujëra, vizitat në zonat përkatëse, konsumimin e produkteve të liqenit dhe detit (midhje, peshk), si dhe çdo simptomë sëmundjeje të shfaqur më pas. Nga 100 të anketuar në Sarandë, 22 banorë vendas dhe 56 turistë raportuan se janë larë në këto ujëra, ndërsa 22 nuk janë larë. Nga ata që janë larë, 20 raportuan sëmundje dhe 17 përjetuan shqetësime pas konsumimit të midhjeve. Megjithëse nuk është vendosur një lidhje shkak-pasojë e drejtpërdrejtë, monitorimet e mëparshme kanë treguar se nivelet mikrobiale në disa pika kanë tejkaluar kufijtë e pranueshëm, dhe rritja verore e sëmundjeve infektive dyshohet të jetë e lidhur me ekspozimin ndaj ujërave. Këto gjetje sugjerojnë një lidhje midis larjes në ujërat sipërfaqësore—si në Liqenin e Butrintit ashtu edhe përgjatë bregdetit të Sarandës (Deti Jon)—dhe shfaqjes së simptomave shëndetësore, duke theksuar nevojën për kërkime të mëtejshme për vlerësime më të sakta.

Fjalë kyçe: *Anketë, midhje, sëmundje, shëndet publik, ujra sipërfaqësorë.*

Introduction

Numerous studies worldwide, including those conducted in Albania, emphasize the contamination of surface waters by pathogenic fecal microorganisms, which pose a significant risk to public health (Pandey et al., 2014; Lew et al., 2023). Research highlights not only the poor microbial quality of bathing waters but also their association with a variety of diseases linked to water quality falling below established standards (Çullaj et al., 2022; Çullaj et al., 2024; Çullaj et al., 2025; Wilkes et al., 2023; WHO 2023, WHO 2016). Infectious diseases commonly reported include those affecting the skin, eyes, ears, and the gastrointestinal system, all of which can result from exposure to contaminated waters. Untreated wastewater discharged into lakes or seas is particularly associated with increased incidence of diseases caused by diverse human pathogens. Consequently, individuals bathing in such waters risk exposure not only to pathogens but also to antibiotic-resistant strains (Amos et al., 2014; Ferreira et al., 2022). Moreover, consumption of mussels and fish has been linked to health issues such as food poisoning, vomiting, and diarrhea (Jurinović et al., 2022; Lopatek, Wieczorek, & Osek, 2022).

The Butrint mussel (Mytilus galloprovincialis), or Mediterranean mussel, is among the most important cultivated marine products in Albania. Lake Butrint has historically been the central hub for mussel farming for decades. Cultivation began in the 1960s–1970s, establishing the area as the country's primary mussel production site. Today, Butrint remains the most developed mussel aquaculture region in Albania, playing a vital economic role for the local community. The main cultivation and harvesting season typically spans from spring to late summer, when biological conditions favor optimal growth and high-quality mussels (FAO, 2020). Butrint mussels are marketed both locally and internationally. Historically, they have been exported to international markets, especially EU countries such as Greece and Italy (Marku & Dodbiba, 2018), maintaining their culinary, cultural, and economic value for the region (Butrint National Park, 2020).

According to the Integrated Management Plan for Butrint National Park 2020–2030, around 50 active cultivation structures currently operate in the area, with a production capacity of 500–1000 tons per year (Butrint National Park, 2020). Historically, production has reached much higher levels, up to 2000–5000 tons

annually, with approximately 70% exported, mainly to EU countries (Butrint National Park, 2020). Recent studies also highlight the role of mussels as bioindicators of water quality; for example, research in 2023 detected traces of rotavirus in some samples, emphasizing the need for ongoing environmental monitoring (Lugaj et al., 2023). Thus, while mussel farming remains an important economic resource, it faces modern challenges that require careful management and adherence to food safety and ecosystem protection standards.

This study aims to assess the impact of microbiological contamination of surface waters and mussel and fish products in the Saranda area—covering both the Ionian Sea and Lake Butrint—by analyzing survey data collected over three months during summer and autumn 2025. The study focuses on community and professional awareness regarding the risks posed by such contamination to public health.

Saranda, located in southern Albania near the border with Greece, stretches along the Ionian coast and serves as a gateway for visitors to Butrint National Park (Saranda Explore, n.d.). The city's population is relatively small, around 30–35 thousand residents, but during the tourist season, visitor numbers can increase up to 20 times the local population (ATA, 2025). The Mediterranean climate, with hot summers, mild winters, and predominantly winter rainfall, creates favorable conditions for both tourism and coastal community livelihoods (Ramsar Site 1290 – Butrint, 2003; Bego & Malltezi, 2011). Lake Butrint, classified as the "Microcosm of the Mediterranean" and a UNESCO heritage site (UNESCO, n.d.), is connected to the Ionian Sea. It represents a unique ecosystem, including a brackish water lagoon and surrounding woodlands, providing habitats for numerous plant and animal species (Butrint National Park, n.d.). The area is renowned for its mussel farming sites; production has increased in recent years, supporting the local economy and contributing to food security (Butrint National Park Integrated Management Plan, 2020–2030). Tourism is a major economic activity; Butrint National Park and the beaches near Saranda attract growing numbers of domestic and international visitors (ATA, 2025). Mussels, as a traditional product of Lake Butrint, hold significant cultural and economic importance, though the sector faces various challenges, including pollution and regulatory management issues (Maçi et al., 2024; Lugaj et al., 2023).

Figure 1. View of the city of Sarandë, including the coastline and the urban center

Figure 2. View of the Butrint Lagoon, illustrating its natural habitat and local biodiversity

The ecosystem of Lake Butrint and its surrounding areas is protected under National Park status and includes zones safeguarded under the Ramsar Convention for wetlands (Ramsar Site 1290 – Butrint, 2003). Its natural

beauty, rich biodiversity, and archaeological significance make Sarandë and Lake Butrint important destinations for both ecological and cultural tourism. Favorable climatic conditions, increasing visitor numbers, and the development of aquaculture activities position this area as one of the most visited and strategically significant regions for research in southern Albania (AKZM).

Water pollution has a significant impact on human health. Contamination of water resources due to both natural processes and human activities poses a global public health threat (Babuji et al., 2023; Li, Yang & Xu, 2022; Biryar Mohammed Mustafa & Hassan, 2024). Water pollution can lead to various health implications, including communicable and non-communicable diseases, as well as the spread of pathogens and disease vectors (Boelee et al., 2019). Studies conducted not only in developing countries but also in developed nations, such as Switzerland (Çullaj et al., 2025), have shown a link between low microbial water quality caused by untreated fecal pollution in surface waters and a range of self-reported illnesses, including skin, gastrointestinal, ear, and eye infections (Leonard et al., 2018; Wade et al., 2003; Mustafa & Hassan, 2024; Suraifi et al., 2023). Exposure to contaminated water can pose serious health risks, particularly for children, the elderly, and immunocompromised or sensitive individuals (Agbasi & Egbueri, 2022). Our survey and study data (Çullaj et al., 2025) provide a foundation for future research aimed at developing approaches and technologies to maintain water quality within recreational water standards, primarily by reducing pollutants from wastewater sources.

In the structured questionnaires, the formulated hypotheses reflected through the questions and various response options aimed to assess the microbiological quality of water in the study areas (Sarandë – Ionian Sea and Butrint Lagoon), to determine whether they meet established standards for recreational waters. Another hypothesis focused on the existence of a significant relationship between the presence of pathogens in surface waters and seafood, based on local community perceptions regarding the public health risks posed by such pollution.

The study integrates laboratory data collected over three years with social and institutional analyses, examining two areas with distinct ecological and socio-economic characteristics (Çullaj et al., 2025). In Albania, there are no

comparable studies for these regions, as public opinions and perceptions often provide insights that are more compelling than indirect official data or previous studies. In this way, the research not only identifies areas where bacterial pollution poses a public health risk but also provides additional valuable information for policymakers regarding the need to improve wastewater treatment infrastructure.

The survey aimed to offer an integrated overview of practices, perceptions, and risks associated with the use of coastal waters and seafood in Sarandë/Butrint, serving as a basis to evaluate potential public health impacts and to inform possible protective measures or necessary policy interventions. Furthermore, it contributes to increasing public and institutional awareness of the impacts of water pollution, particularly under conditions of climate change and growing tourist pressure, which has significantly increased in recent years.

Materials and Methods

Between July 2025 and September 2025, a survey was conducted using a questionnaire via the "Google Form" platform: Link to the questionnaire (link) (Questionnaire for assessing the quality of the Ionian Sea waters in the Sarandë area and Lake Butrint, as well as the analysis of seafood consumption and production, with a focus on mussels from Lake Butrint). The questionnaires collected data on perceptions of water quality and usage, health impacts, and public awareness. Respondents included local residents, tourists, and professionals in environmental and health sectors.

The study targeted randomly selected individuals under the theme: "Assessment of Ionian Sea water cleanliness – Sarandë and Lake Butrint (microbiological quality of mussels) and implications for public health." After providing informed consent and receiving information on the purpose of the survey, 100 participants from the Sarandë region completed the questionnaire. The questionnaire included information on water usage, perceptions of water quality, health impacts, and public awareness. The aim of the survey was for participants to objectively report their exposure to coastal waters of the Ionian Sea in Sarandë and Lake Butrint over the past two to three years. For this region, questions also addressed the consumption of mussels cultivated in Lake Butrint. A copy of the questionnaire is available in the supplementary materials.

The total number of survey participants in the Sarandë area was 100. Participant demographics by age and gender are presented in Table 1.

Table 1. Percentage distribution of survey participants by age group

Age and gender distribution in Sarandë (women and men)		
Age	**W**	**M**
16 - 25	51 (%)	10 (%)
26 - 45	18 (%)	17 (%)
46 - 65	0 (%)	2 (%)
66 <	2 (%)	0 (%)
Total	**71 (%)**	**29 (%)**

Results indicate that the 16–25 age group was the most represented, accounting for 61% of the total, with females predominating (51% of the total). The 26–45 age group showed a more balanced gender distribution (18% female and 17% male), while participation from older age groups was minimal (2% each). Overall, females comprised 71% of participants and males 29%, indicating higher female participation in this study. These data provide an overview of the demographic profile of participants and are useful for interpreting responses regarding coastal waters and seafood consumption.

Regarding the question, “Have you visited the sea in the Sarandë area for swimming, cooling off, or relaxation?”, 69% of participants reported frequent visits, 26% occasional visits, and only 5% never visited. These findings indicate that the Sarandë coast is widely used for recreational activities and represents an important source of relaxation and entertainment for both residents and visitors. For the question, “How would you rate the cleanliness of the Ionian Sea in the Sarandë area?”, results (Table 2 and Figure 1) show that most participants rated the water as “very good” or “good,” particularly among the 16–25 and 26–45 age groups, which also represent the majority of respondents. Negative ratings (“polluted” or “very polluted”) were minimal, suggesting a generally positive perception of water quality.

These results indicate that the Sarandë sea is largely perceived as clean and suitable for recreational activities.

Table 2. Assessment of Ionian Sea water cleanliness in Sarandë

How would you evaluate the cleanliness of the water in the Ionian Sea in the Sarandë area?					
Age	**Very good**	**Good**	**Acceptable**	**Polluted**	**Heavily polluted**
16 - 25	21	24	15	1	0
26 - 45	11	13	6	4	1
46 - 65	0	1	1	0	0
66 <	0	2	0	0	0
Total	**32 (%)**	**40 (%)**	**22 (%)**	**5 (%)**	**1 (%)**

Based on the question, “Do you consider the water in Sarandë suitable for bathing?”, the vast majority (78%) indicated that the water is suitable, reflecting a positive perception of its quality and safety. Only 9% considered it unsuitable, and 13% were uncertain. These findings suggest that most users trust the water quality, although a small proportion expressed concerns or lacked sufficient information.

Table 3. Participants’ knowledge of health risks from bacterial pollution in coastal waters

Are you aware of the potential health risks posed by bacterial contamination in these waters?					
Age	**Yes, very much**	**Yes, moderately**	**Not much**	**No risk**	**I don’t know**
16 - 25	7	16	18	7	13
26 - 45	4	6	18	0	7
46 - 65	0	1	0	0	1

66 <	0	0	0	2	0
Total	**11 (%)**	**23 (%)**	**36 (%)**	**9 (%)**	**21 (%)**

Data in Table 3 indicate that most participants (36%) reported being moderately informed about health risks from bacterial contamination in Sarandë waters, 23% reported being well-informed, while a notable proportion either did not know or did not perceive a risk (21% and 9%, respectively), highlighting the need for further public awareness and education on coastal water safety.

According to Table 4, participants identified untreated wastewater discharge (77%), mass tourism (55%), and urban waste (55%) as the main sources of sea water pollution in Sarandë, while aquaculture and other sources were perceived as less problematic (26% and 9%, respectively). These results highlight the community's primary concerns regarding coastal pollution.

Table 4. Participant's perception of major sources of sea water pollution in Sarandë (multiple responses allowed)

Which do you consider to be the primary sources of sea water pollution? (Multiple answers are possible)					
Age	**Sewage discharges**	**Mass tourism**	**Aquaculture (fish/mussel farms)**	**Urban waste**	**Other**
1 - 15	4	3	2	3	1
16 - 25	45	32	5	27	3
26 - 35	15	10	12	15	4
36 - 45	11	9	6	8	0
46 - 55	1	0	0	0	1
56 - 65	1	0	1	1	0
66 <	0	1	0	1	0
Total	**77 (%)**	**55 (%)**	**26 (%)**	**55 (%)**	**9 (%)**

Among participants who reported health issues after bathing, based on the question “Have you experienced any health problems after swimming in the sea in this area?”, 20% reported symptoms. The most common problems included skin irritation (14%), uro-genital infections (10%), and eye and ear infections (9%), while 30% reported other unspecified issues.

Data presented in Table 5 and Figure 4 indicate that most problems were mild or varied, and severe cases (uro-genital infections) were rare, suggesting that the Sarandë sea is generally perceived as safe for bathing.

Table 5. Percentage of participants by type of health problems after swimming (multiple responses allowed)

If so, what kinds of problems do you perceive? (Multiple answers are possible)				
Age	**Dermatological problems**	**Ocular and ear infections**	**Urogenital infections**	**Other**
16 - 25	9	3	6	19
26 - 45	5	6	4	9
46 - 65	0	0	0	0
66 <	0	0	0	2
Total	**14 (%)**	**9 (%)**	**10 (%)**	**30 (%)**

Approximately 14% of respondents (Table 6) reported that children swimming in the sea experienced health issues, while 32% reported no problems. More than half (54%) had no information, indicating a lack of direct knowledge regarding this issue.

Table 6. Participants' perception of health issues in children after swimming

Are you aware of any cases of children who, after swimming in the sea in the Sarandë area, have experienced any health problems?			
Age	**Yes, the children went swimming and subsequently experienced health concerns (such as skin rashes, diarrhea, etc.)**	**Yes, the children swam, but did not have any health problems.**	**I have no informatio n available**
16 - 25	6	22	33
26 - 45	7	8	20
46 - 65	1	0	1
66 <	0	2	0
Total	**14 (%)**	**32 (%)**	**54 (%)**

Results (Table 7) show that 67% of participants frequently consume seafood products from Sarandë, 26% consume them occasionally, and only 7% do not consume them at all. These findings indicate a high level of seafood consumption across all age groups.

Table 7. Participants' perceptions and distribution of responses regarding seafood consumption

Have you regularly consumed seafood originating from Sarandë (e.g., fish, mussels, squid)?				
Age	**Yes, frequently**	**Rarely**	**Never**	
16 - 25	41	**15**	5	
26 - 45	22	**11**	2	
46 - 65	2	0	0	

66 <	2	0	0	
Total	**67 (%)**	**26 (%)**	**7 (%)**	

Data for the question "Have you heard of any cases of poisoning from consuming mussels in Sarandë?" show that only 29% of participants had heard of such cases, while 71% had not, suggesting a general perception of safety regarding mussel consumption in the area.

Results for the question "Have you ever felt unwell after consuming mussels or other seafood in this area?" indicate that only 14% of participants reported feeling unwell after consuming mussels or other seafood, whereas 83% reported no issues, suggesting good tolerance and a low occurrence of problematic cases in the region.

Among participants who did report discomfort following seafood consumption (Table 8), the most common symptoms were abdominal pain (16%) and "other" symptoms (28%), which may include various unspecified complaints. Vomiting (11%), diarrhea (9%), and fever (7%) were less commonly reported. These findings indicate a range of reactions, with gastrointestinal symptoms being the most prominent.

Table 8. Percentages and distribution of symptoms reported after seafood consumption (multiple responses allowed)

If so, what symptoms have you experienced? (Multiple responses are allowed)					
Age	**Vomiting**	**Diarrhea**	**Abdominal discomfort/pain**	**Fever**	**Other**
16 - 25	4	5	9	3	21
26 - 45	7	4	7	4	6
46 - 65	0	0	0	0	0
66 <	0	0	0	0	1
Total	**11 (%)**	**9(%)**	**16(%)**	**7(%)**	**28(%)**

Regarding the question “Are you informed about the monitoring or analyses conducted on the safety and quality of seafood products in this area?”, only a small proportion of participants (10%) reported being informed, while 55% were not informed and 35% were unsure. This indicates a low level of awareness regarding seafood safety monitoring and highlights the need for broader public information and education in this area.

The question on participants’ trust in the safety of seafood products sold in the market shows that only 24% expressed high confidence, while 39% reported low confidence, 11% had no confidence, and 26% had no opinion. These findings suggest a mixed perception and a relatively low level of consumer trust. Participants were also asked how they prefer to receive information about food safety and water pollution, as well as their opinion on the need for additional measures to ensure water quality and seafood safety. Results indicate that most participants prefer information through social media (65%), local institutions (53%), and local media (47%), while a smaller proportion preferred fishing associations or other sources. Additionally, 79% of respondents believed that further measures should be taken to improve water quality and product safety, reflecting a high level of awareness and public interest in continuous monitoring and intervention.

Results and discussion

Among the 100 individuals surveyed in the Sarandë region (Ionian coastal zone and Butrint Lake), the gender distribution was unbalanced: 71% female and 29% male. The age distribution shows that the most represented group was 16–25 years (61% of the total), with females being the majority (51%). This predominance of female respondents is not unusual in survey-based studies—methodological literature widely documents that women are generally more inclined to participate in questionnaires and surveys (Becker, 2022). In particular, a mixed-mode panel survey found that women exhibited higher response rates across all modes (online and telephone) (Becker, 2022).

Moreover, in broader contexts, women tend to express higher awareness of environmental issues and are more likely to respond positively to questions related to wellbeing, health, and the environment (Ergun, Karadeniz & Rivas, 2024). This tendency may partially explain the gender imbalance observed in

our study—an important factor to acknowledge as a limitation when interpreting the results.

With regard to the use and perception of coastal waters, 69% of participants reported frequent visits to the sea, while only 5% never visited, indicating that the Sarandë coastline is widely used for swimming, cooling off, and relaxation. Furthermore, 78% considered the water suitable for bathing, reflecting a relatively high level of trust in local water quality. Cleanliness assessments (Table 2) were mostly clustered in the categories "very good" and "good," with negative evaluations being minimal—suggesting an overall positive perception of the sea as a recreational and (presumably) safe environment for bathing and an asset for the local community.

However, awareness of bacterial risks remains modest. This positive perception does not consistently align with high levels of risk awareness: only 23% of respondents reported being "well informed" about bacterial hazards, while 21% stated that they "did not know" whether such risks exist. This indicates a gap in public education regarding coastal water safety.

From a health perspective, 20% reported experiencing health problems after bathing in the sea—primarily skin irritation (14%), uro-genital infections (10%), and eye/ear infections (9%). Although most complaints appeared mild, these findings show that exposure to coastal waters—despite being perceived as "safe"—may nonetheless cause health discomfort among a portion of the population.

Overall consumption of seafood products (fish, mussels, etc.) is high (67% reported frequent consumption), while only 14% stated that they had felt unwell after consuming mussels or other seafood—mainly with gastrointestinal symptoms. Particularly concerning is that only 10% reported being informed about monitoring or testing related to seafood safety in the area. This indicates that, despite high usage of coastal waters and high seafood consumption rates, and despite generally positive perceptions of cleanliness, there is a notable gap in public awareness regarding risks and an apparent lack of communication on existing monitoring practices. This may contribute to underreporting of symptoms or infections, as individuals may not seek medical consultation. From a public health perspective, this represents a meaningful concern.

Overall, the findings for Sarandë offer an informative overview of community perceptions and behaviors regarding coastal waters and seafood products. At the same time, they highlight several limitations and areas where targeted interventions, improved monitoring, and enhanced public communication are needed.

• Gender imbalance in participation: The high percentage of female respondents (71%) aligns with broader trends in the literature indicating that women are generally more inclined to participate in survey-based research (Smith, 2008). This imbalance may lead to an underrepresentation of male perspectives and should be considered a methodological limitation.

• Positive perceptions contrasted with low risk awareness: While most respondents perceived the sea/lake water as clean and suitable for bathing, only a small proportion were aware of bacterial risks or the lack of monitoring systems. This discrepancy raises concerns about the actual level of safety, particularly given that many users visit the sea frequently or consume seafood products.

• Exposure and informal/self-treatment without medical consultation: Seafood consumption and recreational bathing occur in a context where the majority of participants were unaware of monitoring or testing for safety—this increases the likelihood that individuals may ignore symptoms or infections, or rely on self-medication without medical advice. Such practices may contribute to antibiotic resistance in bacterial pathogens. These findings underline the need for institutional measures, including regular monitoring of water and seafood quality, public information campaigns, and education on health risks.

Survey limitations

In addition to the gender imbalance, it is important to note that the age distribution was heavily skewed toward younger participants—older age groups (46–65, 66+) were minimally represented. This compromises the representativeness of the sample, particularly for groups that may have different behaviors, perceptions, or levels of vulnerability. Compared with international literature on environmental perceptions and pro-environmental behaviors, our results reflect similar patterns: for example, international studies on climate risk perception document that women, across many countries, are more engaged in pro-environmental behaviors, better informed

about health issues, and more likely to participate in environmental research (Ergun et al., 2024; Zavala et al., 2024). Overall, the findings indicate that despite the positive perception and widespread use of seawater and seafood resources in the Sarandë and Butrint lagoon areas, there is a critical gap in awareness and monitoring—a situation that may pose risks to public health. To strengthen safety and protect the community, the study recommends: regular monitoring of water and seafood quality; awareness campaigns; increased public education on risks; and further research with a more demographically representative sample.

Conclusions

The microbiological quality of water at several of the studied sites fails to meet standards for recreational use, particularly during the summer months. Community perceptions of pollution risk are generally high and largely consistent with both laboratory findings and survey results. Reported health problems, including skin and gastrointestinal infections, point to a possible link between water contamination and exposure levels that may exceed acceptable limits. However, despite this concern, public knowledge remains limited, as only a small proportion of respondents are aware of existing monitoring programs or the main sources of pollution. Urgent interventions are required to upgrade wastewater treatment infrastructure, complemented by targeted environmental education initiatives in schools, the media, and relevant institutions. In addition, the consumption of mussels and other seafood from the studied areas should be subject to regular monitoring in order to minimize potential food safety risks.

The study highlights the need to establish an open and transparent communication platform that connects authorities, the scientific community, and the public, enabling the sharing of real-time information on water quality. At the same time, it should be acknowledged that survey responses may be influenced by subjective factors such as respondents' level of education, personal experiences, or cultural perceptions of health and the environment. Additionally, limited participation may reflect constraints related to access or a lack of willingness to engage. Despite these limitations, the study followed a rigorous methodology and provides valuable data to support future research and inform environmental and public health policies.

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