


Explaining the Determinants of Pediculosis Control and Prevention: A Qualitative Study in Southern Iran

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Abstract

In many regions of the world, human head lice infestations caused by *Pediculus capitis* are a major health concern among school-aged children. This study was carried out to explain variables influencing pediculosis prevention and control from the perspective of parents and teachers of female elementary school pupils, as well as healthcare practitioners in Bandar Abbas, Iran. Participants in this qualitative study included 23 participants, including parents and teachers of primary school girls, as well as healthcare practitioners. Purposive sampling was employed and sustained until data saturation was reached. Data was acquired through in-depth interviews and evaluated using content analysis in the form of constant comparison. To assess the quality of the outcomes, Lincoln and Guba's criteria were used. The data were extracted into 2 primary categories, including challenges and facilitators to controlling pediculosis, each with several subcategories as follows: 1) economic-political aspects; 2) family factors; 3) social-cultural elements; 4) personal and mental issues; 5) geographical position of the investigated region; 6) school and education factors; and 7) factors related to medications and therapy. There were 2 types of facilitators: 1) informative factors and 2) social-cultural variables. According to the findings, pediculosis prevention, control, and treatment necessitate multifaceted and multi-level intervention. Some solutions must be addressed at the personal-psychological, familial, political-economic, geographical, and informational levels, as well as school-related concerns, social stigma elimination, and evaluation of cultural components of the issue at the social level.

Keywords

pediculosis, lice, prevention, qualitative study, Iran

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What do we already know about this topic?

The variables that present challenges for frontline workers in dealing with pediculosis include economic-political aspects; family factors; social-cultural elements; personal and mental issues; the geographical location of the investigated region; school and education factors; medication and therapy factors; and 2 types of facilitators: informative factors and social-cultural variables.

How does your research contribute to the field?

According to the findings of this study, pediculosis prevention, control, and treatment necessitate multidimensional and multilevel intervention. Some remedies must be applied at the personal-psychological, familial, political-economic, geographical, and informational levels, as well as school, social stigma, and cultural aspects of the issue at the societal level.

What are your research's implications towards theory, practice, or policy?

This is a study that used a content analysis technique, and its goal is not to extract a theory; rather, understanding the ideas recovered from the data might help policymakers prioritize planning to solve this health problem. Additionally, parents, school health educators, and other health providers will take greater precautions to prevent and control pediculosis.

Background

For more than 10 000 years, pediculosis has been a widespread global concern for human communities as a factor affecting societal health caused by an external parasite called lice.¹ Pediculosis has remained a health concern despite advances in health and medical science.^{2,3} This sickness is caused by a 2–4 mm forced external blood-sucking parasite known as lice. Lice are wingless arthropods that feed on human blood and infest hair and skin. Nits are white, oval-shaped eggs that are about 4 mm in size, cling to the hair shaft, and hatch in 8–10 days. They stick out about 1–1.5 mm above the hair shaft.⁴

Lice infestation in the head is one of the most common parasitic disorders in people of all ages, with a high prevalence in congested areas, especially in schools for children aged 3 to 11. Girls are more likely than boys to become infested. The most prevalent form of lice transmission is through personal contact. Contact with shared products or the close proximity of personal objects such as towels, combs, undergarments, caps, scarves, and mattresses can also result in indirect infestation.⁵

According to the National Pediculosis Association of the United States, an epidemic begins when the infestation rate of head lice surpasses 5%.^{6,7} Several studies from various places in Iran found head lice infestation rates ranging from .47% to 28.5%.⁸ In Iran, several studies on the epidemiology of head lice and its risk factors have been conducted. In an investigation in Sirjan county, parents' literacy, family size, school grade, and having a bathroom in the house were some of the factors reported to have significant associations with the frequency of head lice infestations⁹; sex, father's occupation, mother's education level, having a bathroom in the house, previous history of the infestation, and nationality were explored in an Aran-Bidgol county study¹⁰; geographical area (city or village), itching, student's age, the prevalence of the

infestation in the family, and history of infestation were found in a Damghan county study¹¹; school grade, family size, and type of house were the factors in a Khajeh city study¹²; the age of children, father's occupation, father's education, mother's education, using a common comb, and school grade were revealed in a Paveh city study⁸; and children's age, use of hair oil, and the presence or absence of dandruff were explored to have pivotal relations with head lice infestations in an Iranshahr county study.¹³

According to an Iranian meta-analysis, the prevalence of pediculosis among students in 2015 was 7.4%, with 1.6% being boys and 5.8% being girls.¹⁴ However, the prevalence of head lice infestation varies by region due to the effects of various variables such as age, gender, residence location, presence of health instructors in schools, social status of parents, inappropriate socioeconomic situation, population density in a family, and low standard of living and quality of life.^{15,16} According to,¹⁷ 20.8% of youngsters in Bandar Abbas's Chahestani area were afflicted with head lice. There were 33.26% girls and 6% boys among them. Sanie Dehkordi et al discovered head lice in 56.15% of primary school girls in Sirik County, Hormozgan Province, Iran.¹⁸

In addition to immediate symptoms (e.g., head itching, skin scrapes, and irritations caused by lice saliva and feces beneath the skin), people infested with lice parasites are prone to sleeplessness, psychological troubles, scholastic failure, melancholy, and secondary diseases. Other problems associated with head lice infestations include infestation and purulent discharge, scalp swelling and separation, allergies, and loss of social status.¹⁹ In comparison to adults, elementary school students are the most vulnerable to head lice infestations. Girls are more susceptible than boys,²⁰ due to their higher hair volume.^{21,22} Lice infestation in children has an impact on their quality of life, education level, and the spread of infestation.^{19,23,24}

In general, lice infestations are more prevalent in low-income and congested communities, though the prevalence is not limited to one socioeconomic class.^{23,25} Age, economic situation, sex, family size, environmental health status, social class, and education level are all factors that influence the occurrence of lice infestations. Despite the fact that improved health and hygiene have a critical role in lowering pediculosis, this parasite infestation may be found even in industrialized nations.^{14,26}

To improve health, the most effective strategy to combat the infestation is to use shampoos containing insecticides such as lindane and permethrin on individuals with the condition, as well as public education in affected communities.^{27,28} In terms of the relevance of schools as congested places where pediculosis may arise, they are the best option for providing education and treating infestations.²⁹ According to WHO reports, despite better health standards, medical science advancements, efforts, and expenditures, lice infestation has not been reduced and continues to be a public health issue.³⁰

As a result, the current study was conducted in order to determine the causes and controlling factors of pediculosis as well as to identify affected people's knowledge, perspectives, experiences, feelings, and perceptions. Furthermore, the majority of contemporary pediculosis research has used quantitative, epidemiologic, clinical, and descriptive approaches, with few qualitative studies on the reasons for pediculosis control. Therefore, the current study employed a qualitative approach to identify variables influencing pediculosis management from the perspectives of Iranian parents, teachers, and healthcare experts.

Materials and Methods

Study Area

We employed a qualitative technique as well as a traditional content analysis method.

Data Collection Tools and Methodologies

The current study was conducted in Bandar Abbas, Iran, and employed a qualitative approach as well as the traditional qualitative content analysis method. In some cases, the purposive technique was used to select participants, whereas in others, the snowball-sampling method was used (8 subjects). The researcher invited participants who were aware of the issue or who had pediculosis among their primary school girls to introduce them to others who had similar experiences. Prior experience dealing with people suffering from pediculosis, as well as a desire to participate, were required for inclusion.

The semi-structured depth interviews with open responses were the primary data collection approach in this study. Face-to-face interviews were conducted in health houses and

schools in person and over the phone from late February 2019 to early January 2020, inviting healthcare employees (e.g., employees working in family health and environmental health, school health educators, psychologists, and physicians working in this area) as well as parents and teachers (11 months). Each interview lasted between 15 and 46 minutes. The Hormozgan University of Medical Sciences ethics committee assigned this study an ethical code (IR.HUMS.-REC.1398.435). Before the interview, the researchers designed the questions in in-person and online sessions as well as provided question guidelines. In addition, the researchers stated the study's goal. The purpose and interview approach were then explained to the participants, who then signed the consent form and answered the questions. It is worth noting that each participant's questions were asked in a different order, and more exploratory questions were provided based on their previous responses. Participants were allowed to choose the time and venue of their interviews.

The majority of the interviews were performed and transcribed simultaneously prior to the COVID-19 pandemic, with the remaining 5 interviews being completed over the phone due to pandemic and quarantine restrictions. This technique was used to gain access to a diverse range of people. In all interviews, the interviewer introduced himself/herself, stated the objectives, and then handed out a consent form for participants to fill out and sign. In cases of absence, the consent letter was sent or texted to each participant, who then resent the signed letter through WhatsApp or email. Following the transcription of face-to-face interviews, the texts were given to participants for review and an indication of approval. Following basic explanations and an appreciation for participating, interviews began. The interviews were properly taped and transcribed verbatim.

The questions were developed using the research background as well as the opinions of consultants and faculty members. To divide the questions, predesigned objective-based (expressing barriers and facilitators of pediculosis control from the standpoint of participants) and exploratory items were employed.

Some Questions Were as Follows:

- What challenges do you have when it comes to controlling and treating lice?
- What issues do you have with pediculosis in your family?
- Who, in the opinion of the participants, are the facilitators of pediculosis control? What difficulties did you have when treating your child's pediculosis?
- What could make it easier for you to tackle the problems?
- What are your suggestions for resolving these issues?
- What can help you get through this scenario and overcome the issues you have mentioned (social, economic, emotional, physical, and mental)?

Table 1. Demographic Characteristics of Participants.

Variable	Dimensions	Frequency	Percent %
Sex	Female	14	61
	Male	9	39
Age	Younger than 30	7	30
	30–40	11	48
	Older than 40	5	22
Job	Family health	4	17.5
	School health	4	17.5
	Environmental health	3	13
	Psychologist	2	9
	Family physician	2	9
	Teacher	3	13
	Housekeeper	5	21
Education	Below diploma	4	17
	Diploma-BA	5	22
	BA and above	14	61

- How did the support of others assist you in dealing with this situation?
- Was the resurrected assistance beneficial in dealing with the problems created by this infestation?
- Is a lack of protective facilities a factor influencing pediculosis encounters among children, family members, and school members, and if so, how?
- What difficulties do you think are the root causes of pediculosis in families?
- What challenges did you face while treating pediculosis in your clients and their families?
- What could be more beneficial in resolving challenges that schools and healthcare facilities encounter when treating pediculosis? What solutions do you have to relevant problems?

Researchers in this study reached theoretical saturation after interview number 21. Two further interviews were conducted, and data collection ended after interview number 23.

Data Analysis

The data were analyzed using the MAXQDA-10 software in accordance with the 5 procedures proposed by Graneheim and Lundman.³¹ The information recorded on the audio recorder was transcribed word for word immediately following the conclusion of the interviews. Before moving on to the next interview, each one's data were analyzed and coded. After each interview was completed and its text entered into the program, the text of the interview was reviewed line by line, and each portion of the participant's statement relevant to the study topic was coded. The codes were grouped according to their similarities and differences. In contrast, the codes and categories were compared across all interviews.

The first and third authors performed data analysis using the 5-steps of the Graneheim and Lundman approach³¹ and

MAXQDA-10 software. Immediately following the first interview, the researcher and colleagues put the content of the interviews into the Word 2010 program. Researchers examine interview materials 4 times in the second phase to comprehend the overall context of the text. In the third phase, interview transcripts were read word for word, and considerable effort was spent grouping codes with similar meanings into the same subcategory. Researchers also discovered a connection between similar codes. In the fifth phase, codes and classifications were organized into primary categories with a more complete notion and a high level of abstraction. After that, classifications and subcategories were retrieved. Based on their diverse ideas, all data analysis procedures were exchanged at the authors' meeting.

Rigor

To improve the quality of the results, Guba and Lincoln's criteria were used.³² Researchers chose individuals with a wide range of demographic features to increase the credibility of the study. To ensure dependability, findings were distributed to participants in-person and by phone, allowing them to voice their thoughts and endorse the results. Furthermore, the data analysis and conclusions were shared with 4 top qualitative researchers, who approved the analytical processes and findings. The first, fifth, and corresponding authors all contributed to the analysis and coding process to improve confirmability by attending meetings and exchanging ideas and criticisms. To enhance transferability, a full explanation of the study as well as various direct statements from participants were presented. Furthermore, the findings were disseminated to 6 people who lived in this geographic region and had a comparable socioeconomic position to the research participants but did not engage in the study. And they verified that they had comparable experience to the research subjects.

Ethical Considerations

The Hormozgan Medical Science Ethical Committee examined and approved this study (IR.HUMS.REC.1398.435). Furthermore, all participants signed the consent form and were allowed to abandon the study procedure at any point in accordance with ethical guidelines. Researchers informed participants about the interview technique, the outcome, and their anonymity.

Results

In total, 23 people took part in the study, and Table 1 shows their demographic information. Furthermore, data analysis yielded 58 codes, 9 subcategories, and 2 categories (Table 2), which are mentioned below with quotes and explanations.

The majority of participants (61%) were female, with the remaining (39%) being males between the ages of 30 and 40. In addition to parents of elementary school students, all participants with pediculosis were welcomed to take part in the study.

Table 2. Categories, subcategories, and codes.

Categories	Subcategories	Codes										
Obstacles	Economic-political factors	1. Poverty 2. Income level 3. Financial problems										
	Family factors		1. The indifference of families 2. Inattention 3. Ignorance 4. Lack of awareness 5. Negligence 6. Failure to understand the problem 7. Lack of awareness about a health issue 8. Low importance of the issue for families 9. Individual treatment 10. Lack of adherence to treatment 11. Family problems 12. Lack of father's collaboration 13. Number of children 14. Failure to comply with instructions 15. No tendency to speak about the case 16. No priority of the problem for parents 17. Necessary continual cooperation of families 18. Required self-care of parents 19. Parents' addiction									
			Social-cultural factors		1. Social stigma 2. Traditional treatments 3. Veil or wearing scarf 4. Long hair of girls 5. Involvement of different walks of society							
					Personal and mental factors		1. Ignoring personal hygiene 2. Depression 3. Low physical health 4. The low mental health of parents 5. Sex differences 6. Ignoring personal care					
							The geographical position of the studied area		1. High humidity rate and specific climate of the studied area			
									Factors pertinent to school and education		1. Shortage of screening resources 2. Lack of holistic viewpoint 3. Inattention of schools 4. Inaccurate screening process 5. Lack of schools' resources 6. Population density in schools	
							Factors associated with medicine and treatment				1. Quality of medicine 2. High cost of efficient drugs 3. Drug resistance 4. Collective treatment 5. Need for new medicines 6. Lack of local medicine	
			Facilitators	Social-cultural factors								1. Multi-sectorial approach 2. Culturalization 3. Collaboration 4. Collective treatment
					Informing factors							1. Giving information and teaching skills to parents 2. Continuous instruction designed for families to make them aware of the case 3. Training schools' health educators 4. Self-care training

Family health professionals, school health experts, environmental health experts, psychologists, family doctors, and teachers with a bachelor's degree or higher were among those who took part (6%). According to the data, there are 2 primary types of pediculosis control obstacles and facilitators in Bandar Abbas. The categories included a wide range of subcategories and conditions, resulting in 7 subcategories of barriers experienced by people with pediculosis or similar situations. On the other hand, subcategories pertinent to pediculosis treatment facilitators were highlighted by participants.

Obstacles

The current study revealed several obstructions to pediculosis medication in the studied society, and all of these impediments served as impediments to preventing, regulating, and treating this condition. This category had several subcategories, including economic-political variables, family considerations, social-cultural features, personal and mental concerns, the geographical location of the researched region, school and education components, and medicine and treatment factors.

Economic-Political Factors

Participants, in some cases, reported financial and social status as variables impacting their difficulty in preventing and treating pediculosis. Furthermore, as a result of recent restrictions imposed on the Iranian people, numerous participants mentioned sanctions as a barrier to unfettered access to effective and diverse treatments for this ailment. Others perceive sanctions as putting economic pressure on people's lives and jobs, pushing them to overlook sanitary issues. Furthermore, because many people are in dire financial straits, they are unaware of a condition known as pediculosis. Some families, however, come from higher socioeconomic backgrounds and can afford to purchase better and more expensive medications from abroad to treat this infestation, whilst other low-income families cannot. This area includes sections on poverty, low family income, sanctions, and financial difficulties.

Participant 6: *"What can I say to someone who goes through the garbage looking for food and other items? It makes no difference to such a poor individual."*

Participant 3: *"Economic issues such as the family's income level are quite important. Families with a lot of money, for example, may afford to buy pricey, high-quality shampoos that are more effective. Sanctions, on the other hand, have hampered the entry of flawless foreign pharmaceuticals, resulting in increased prices for high-quality shampoos."*

Participant 3: *"Households with a greater socioeconomic level have fewer children and can pay more attention to their children and their cleanliness, whereas overpopulated families may overlook the hygiene of all of their children."*

Participant 8: *"Most impoverished families must receive donations to notify them of hygiene difficulties because many shampoos are quite expensive."*

Family Factors

Participants identified financial reasons as the most important subcategory, which included a wide range of options. Many participants, for example, expressed worries about family factors such as pediculosis indifference or inattention to this issue for family members. Some participants also claimed that they were aware of the need to treat all family members at the same time, while others emphasized adherence to comprehensive therapy, meticulously following instructions, and family engagement with healthcare facilities and schools. The following alternatives were classified as belonging to this subcategory:

Indifference of families, inattention, ignorance, lack of awareness, negligence, failure to understand the problem, lack of awareness about a health issue, low importance of the issue for families, individual treatment, lack of adherence to treatment, family problems, lack of father's collaboration, number of children, failure to comply with instructions, no tendency to speak about the case, no priority of the problem for parents, necessary continual cooperation of families, required self-care of parents, and parents' addiction.

Participant 6: *"Pediculosis is more common in households where the mother does not receive emotional support from her husband, where there is domestic abuse, and where there is despair; so lice cannot be a problem in such situations. Furthermore, this issue is more prevalent in addiction-affected households. In certain circumstances, addicted parents have a high socioeconomic level and are well educated."*

Participant 7: *"Some families do not understand that pediculosis is a hygiene concern, while others who are aware of the situation are unaware that the problem must be addressed in health care facilities. Such families believe that pediculosis is a family problem."*

Participant 4: *"Some people, for example, are unaware that anti-lice shampoo is only used on dry hair, or they are unaware of the optimal time and technique for combing, or they are bored of constantly using a comb. Such folks do not utilize the needed goods on a regular basis, but just on the first or second day. My baby had lice, and I had no idea how to use anti-lice shampoo. I had no idea that it had to be used differently, with a different volume of usage and a different time interval between uses."*

Participant 3: *"Many families are unaware that the treatment cycle must be followed. Some families, for example, do not adhere to the two-week time period between lotion reuses. Lice are a major worry, and all family members, not just students, must be treated."*

Participant 7: *"Despite the fact that combing is a vital activity, some families do not take it seriously. Many families do not have the time or know how to comb their hair, and some do not do it on a regular basis or with the proper comb."*

Participant 4: *"Families do not discuss this issue because they are embarrassed, while it does not matter to certain families and is not regarded as a major issue. When some families visit our facility, we question them about lice"*

difficulties, and they suddenly realize that they had this problem but forgot about it.”

Participant 3: “Some parents refuse to trim their children’s hair if they have a head lice infestation. They believe it’s humiliating if other people find out why we cut our child’s hair. They are primarily concerned about how others see them.”

Participant 2: “We hold lice training courses, as well as diagnosis and control measures, but they claim it is not a significant case, so tell us about your diet and income. Parents, on the other hand, refuse to acknowledge that their children have hygiene problems and refuse to work with them to address them.”

Social-Cultural Factors

The most prevalent forms of barriers to prevention and control were classified using the subcategory of social-cultural factors. Among the socio-cultural aspects were societal stigma, traditional treatments, wearing a veil or scarf, girls’ long hair, and participation from all walks of life. It is not accepted in the culture of the people who reside in Bandar Abbas to trim girls’ hair. These people, on the other hand, began self-medication as a result of traditional remedies taught by earlier generations, as well as stress generated by the stigma associated with families suffering from pediculosis. Another cause is the dress of Iranian girls and women, who are required to wear a hijab and, consequently, are more susceptible to lice than boys and men.

Participant 6: “Girls in Bandar Abbas are expected to have long hair, and you will seldom encounter a female with short hair unless she is a local girl. Even if their children have pediculosis, some parents refuse to trim their children’s hair. They claim it’s a shame and that everyone will find out that our kid has lice on her head.”

Participant 6: “Some parents prefer not to discuss the situation, so they go to the drugstore and ask the vendor their inquiries because the merchant does not know them. We must be aware of this issue rather than ignore it, because no one likes to talk about it, and many conceal it because they do not want to be accused of inattention and neglect. Most parents are terrified of being criticized, and mothers express their desire not to be labeled as irresponsible mothers!”

Participant 13: “Some parents are embarrassed or ashamed of their situation. It is typical practice among individuals to avoid discussing lice infestations and to keep this problem hidden because of their reputation.”

Participant 8: “The case may involve many households with varying social or economic backgrounds. We have some consumers who arrive in new automobiles to inquire about this ailment. It does not, in my opinion, rely on a person’s financial level or social position.”

Participant 10: “Infant boys and girls, as well as pre-school children, may be infested. However, because of their long hair and veils, school-aged girls are more prone to pediculosis. A few females in Bandar Abbas have short hair; all girls, including babies, have long hair, and their parents

do not cut it. Girls’ long hair has long been a cultural norm in our city, and no one loves short hair.”

Personal and Mental Factors

Participants also noted a variety of physical and mental issues, ranging from inadequate personal hygiene to mental and psychological disorders. This subcategory includes the following codes: ignoring personal hygiene, melancholy, parents’ poor physical and mental health, sex disparities, ignoring personal care, and parental addiction.

Participant 1: “In my opinion, sex is not an important factor; if one is infested, the others will be infested,” says Participant 1. Girls, on the other hand, are treated more harshly than boys.”

Participant 19: “Several years ago, we had a student who liked to wear headbands even on hot days. When a health instructor wanted to evaluate students one day, the girl abruptly fled the class to avoid the inspection. We inquired about the reason, and her teacher stated that the child had lost her mother in an accident in front of the school and witnessed the accident and death of her mother, resulting in significant trauma; in the meantime, she had numerous family difficulties and lived with her stepmother. Because of her family’s inattention, the pupil was despondent and suffering from a terrible live infestation. Hence, they shaved her hair, and she wore headbands since she didn’t want her classmates to see her bare head.”

Participant 23: “Some parents are so rigid that their children are afraid to inform them about their issues. Furthermore, pediculosis is more common in confrontational households where individuals are preoccupied with their problems, as well as in families dealing with addiction disorders or living in a low-income position and collecting rubbish. Furthermore, this condition is more widespread in children from households where the parents have poor self-esteem, are negligent and reckless, or refuse to face the difficulties, as well as in susceptible families with multiple concerns such as addiction and criminality.”

Geographical Position of the Studied Area

According to some participants, the climate in the area influences the spread of pediculosis. These features included high humidity levels and the research region’s surroundings.

Participant 5: “Iranians used to wear more clothes during the winter, which resulted in a higher incidence of problems in the area in question, although this does not occur in Bandar Abbas, where there is no winter and only two or three months of the year are hot. In reality, the environment is constantly conducive to lice growth and spread. I believe the frequency of this condition is lower in the winter, while the rest of the year in this city is hot and humid.”

Participant 10: “Children in Bandar Abbas have wavy hair owing to genetics and humidity, making it difficult to comb.

Because lice may thrive at any time of year, the geographical location and climate of Bandar Abbas make it difficult to treat pediculosis.”

Factors Pertinent to School and Education

Other current concerns identified by participants were a lack of screening resources, a lack of a holistic approach, school inattention, an erroneous screening procedure, a lack of school resources, and population density in schools.

Participant 3: *“Children are more likely to become infested as a result of population density and overcrowding in schools. Children from diverse walks of life attend schools, yet there is a scarcity of throwaway personal goods to check on all students.”*

Participant 14: *“Some schools pay far less attention to this issue, and health instructors do not correctly screen pupils. They do this assignment at random, and only one student is checked at a time. In actuality, schools do not use a comprehensive approach to treatment.”*

Factors Associated With Medicines and Treatment

Some participants expressed concerns about the medications and treatments utilized to treat the illnesses under investigation. Medical quality, the high expense of effective treatments, drug resistance, the need for innovative medications, the scarcity of local medicine, and group therapy were among the problems addressed.

Participant 8: *“Every child in a school, class, or household must be treated at the same time. The quality of drugs is no longer comparable to the past, and, of course, the kind of therapy and prescription shampoo are critical.”*

Participant 5: *“Dimethicone Lotion used to be of higher quality, but it now has no impact on lice; moreover, shampoo components are useful elements. Permethrin combined with dimethicone spray, in my opinion, is superior to permethrin alone. To obtain a positive outcome, medications must be combined.”*

Participant 2: *“Some drugs are more effective than others. I looked around for a suitable therapy for my daughter and discovered shampoo in a drugstore in another city. My kid is doing much better now. Not all shampoos are suitable”*

Participant 22: *“I believe it is preferable to develop a native medication specifically for the hair of individuals living in this city. Drug resistance, in my opinion, has occurred since we can no longer use most shampoos because they have no effect”*

Participant 11: *“We don’t always know which shampoo to pick and buy; we have to test a variety of shampoos. The shampoo provided by the health center is ineffective since it functions like a regular shampoo. We require more potent medication”*

Participant 2: *“Many families utilize traditional therapies and believe in old practices such as applying henna, olive oil,*

white vinegar, or other herbs on children’s heads and covering them with plastic for one or two days. They believe that these methods aid in the removal of lice.”

Participant 15: *“The problem is that the remedies are inadequate. Occasionally, the treatment procedure is not thoroughly described, or the therapy is not completed or is left incompletely.”*

Facilitators

The facilitators of improvement and control of pediculosis were divided into 2 subcategories: social-cultural factors and informative factors.

Social-Cultural Factors

Participants highlighted the importance of social-cultural issues by expressing specific examples, such as the need for culturalization and the removal of social stigma associated with pediculosis, receiving support from various organizations, and collaboration on the collective treatment of infested people in society, not just for a person with a specific diagnosis. The acquired codes for this subcategory are multi-sectoral approach, culturalization, collaboration, and collective treatment.

Participant 5: *“This culture must be formed among individuals to inform us if they have lice; they must understand that the entire family should be treated and that individual treatment is not appropriate.”*

Participant 10: *“Parents need permanent teaching; they should receive comprehensive and continuous teaching with trustees working in the neighborhood, such as clergymen in mosques, health educators, and employees working in health centers, who should cooperate to solve the issue because this is not the task of a single organization.”*

Participant 21: *“The necessary information must be made available to the public; a provincial channel, such as Hormozgan’s provincial broadcasting channel, should disseminate information and raise awareness about the importance of this problem. There should be billboards in the city promoting home screening approaches to familiarize parents with the signs of pediculosis. Informing parents and developing their abilities are important steps that should be performed.”*

Participant 17: *“By providing information in public venues such as mosques, key people may effectively follow the case. Access to important information should be available to health institutions, schools, mosques, and families.”*

Informing Factors

The most important facilitator used to control pediculosis is the informing factors. Informative systems, in fact, can provide specific strategies for preventing and treating this condition. The informing system, according to participants’

statements, comprises of delivering information and teaching skills to parents, offering continuing education to families to keep them aware of the issue, educating school health educators, and providing self-care training.

Participant 7: *“We require ongoing training. One or 2 sessions per year are insufficient, despite the fact that these sessions and seminars are not conducted for parents even once a year.”*

Participant 10: *“In-service training courses for health educators should be developed to explain how to make people familiar with these problems and issue management either in class or schools, so school health educators must be experienced in this sector.”*

Participant 8: *“Monthly distribution of hygiene kits with educational catalogs to low-income people, as well as skill training workshops for them.”*

Participant 10: *“Lice may lurk in various locations, from carpet lint to children’s headphones, mattresses, pillow covers, hats, and scarves that should be washed in hot water every day; this demands self-awareness, continuity, and family participation to treat the matter seriously.”*

Participant 7: *“Self-care is really useful in preventing infestation. Families that monitor their children’s health had a lower incidence of the condition. Pediculosis is uncommon in those who visit a clinic on a regular basis to examine their health. This infestation mostly affects vulnerable families with inadequate self-care.”*

Discussion

The current qualitative study was conducted in Bandar Abbas, Iran, to find variables influencing pediculosis from the viewpoints of parents and teachers of female elementary school students, as well as health care experts. The findings revealed 7 categories of factors impacting pediculosis control, including economic-political factors, family factors, social-cultural factors, school, and education factors, geographical location of the investigated region, and medicine and treatment factors. Economic and political factors are 2 of the most significant factors impacting pediculosis control. The findings of Wafa et al on lice infestation are congruent with the current study’s findings. To avoid pediculosis, parents and teachers should be taught about the dangers of infestation and transmission in the home and school.³³ Pediculosis was more prevalent in low-income families and among illiterate mothers. Rafiee et al performed studies in Ahwaz and a town in Yasuj and observed a strong link between family wealth and the prevalence of pediculosis in students. The high incidence of infestation might be attributed to people’s economic conditions and standard of living.^{30,34} The affluence of a household has a substantial influence on the prevalence of numerous illnesses, including pediculosis.³⁵ The larger the family, the worse the family’s sanitary and medical conditions. In congested houses, parents are unable to routinely inspect their children’s health, and infestations might spread

due to close contact between family members. The present study’s findings indicated apathy, ineptitude, and a lack of cooperation in families, as well as the number of children and ignorance of the most important subcategories of family components. The findings stated above were consistent with those of Eyvazi’s prior research in Islamabad-e-Gharb.³⁶ Hence, hygiene programs, parental and family involvement, better access to health services, personal hygiene practices, and effective health education must be implemented to solve this quandary. Mothers may help improve family hygiene and reduce lice infestations in girls by attending training sessions and collaborating with schools. El-Khawaga et al conducted a head lice study in Egypt and reported a lower frequency of head lice infestations among daughters of educated mothers and higher knowledge about head lice among mothers. Regular inspections, group treatment of affected people, and health education programs may also assist in reducing infestation rates. Consequently, awareness of family cleanliness, collaboration, and attention to the occurrence of pediculosis all play an essential role in reducing illness recurrence. Families with fewer children pay close attention to their children’s health. The size of the family also plays a role in minimizing the frequency of pediculosis.³⁷ The findings of Saghaipour et al were compatible with the findings of this study.¹⁵ Social and cultural characteristics are significant categories that may be utilized to control the occurrence of pediculosis. Most studies discovered that girls had a higher infestation rate than boys because of behavioral variables such as long hair, wearing veils and scarves, close contact of the head, and hair volume. Similar results were obtained by.^{21,36,38} Due to the veil, which causes the scalp to sweat and get infested, females in Muslim states, especially Iran, have a high prevalence of head lice. Girls are more prone than boys to being afflicted with lice. This observation was consistent with a number of previous findings.^{30,39} In contrast, mothers mentioned shame as a reason for not seeking information and monitoring their children’s treatments at schools and health centers. Therefore, the relationship between mothers and schools has deteriorated. Embarrassment, fear of stigma, and a lack of willingness to disclose the issue among personnel working in schools or health facilities all contribute to limited participation and involvement with school staff in dealing with the situation.⁴⁰ Mothers’ participation in group discussions and the opportunity to express their experiences, ideas, feelings, and worries about pediculosis appear to help them address the problem, cope with it without shame, and continue medication. Personal and mental factors were highlighted as crucial aspects for limiting pediculosis prevalence in the current study’s findings. According to Rafinezhad et al, lower-grade students do not adhere to cleaning standards for pathogenic infestation prevention. The incapacity of children to observe personal hygiene norms appears to be the root cause of the high incidence of head lice infestations in elementary schools. As a result, the lower the infestation rate, the

better the individual's health. Personal hygiene leads to disinfection and a lower infestation rate.⁴¹ Both Kasiri et al and Maramazi et al observed that regular bathing has a positive effect on infestation reduction. It indicates that everyday hair combing aids in the eradication of nits and the reduction of the risk. People who do not comb their hair often are more likely to be infested by parasites due to excessive hair tangling.^{36,42} Those who combed their hair less regularly, according to Saghafipour et al, were more likely to have head lice infestations.¹⁵ The decreased infestation among higher-grade students demonstrated that people's awareness and competence in terms of personal cleanliness were improving.⁴³ Geographical location and habitation are important considerations in pediculosis infestation. Moradi and colleagues⁴⁰ discovered a higher prevalence of head lice among urban students in Chabahar, Iran.⁴³ Personal hygiene leads to disinfection and a lower infestation rate. Poor environmental health and insufficient health education in schools were also variables influencing pediculosis control. Hojjati et al reported a statistically significant difference in head lice incidence rates between pupils who had health instructors and those who did not.⁴⁴ The more the pupils' understanding and the cleanliness and screening teachings supplied by the instructors, the lower the pediculosis pandemic will be. Noori et al observed that health educators have a crucial role in lowering the incidence of lice infestations. Health educators may monitor students' health status on a regular basis, find the first lice cases in their early stages, control and treat the cases by sending them to health facilities, and avoid larger transmission and prevalence of infestation among the rest of the students.^{45,46} Rafinezhad et al identified no statistically significant relationship between the number of health educators in a city or village and the prevalence of infestation. This outcome might be related to ineffective screening processes among people with head lice infestations, fear of infected health professionals, and avoidance of close contact with sick children.²⁸ Zareban et al discovered that providing health education to students and their parents helped to reduce head lice infestation. The prevalence of head lice was significantly reduced among trained primary school students in Zabol, while there was no change in the control group. The above-mentioned training session included the general lice profile, head lice symptoms, prevention, and treatment procedures, all of which were delivered in the form of booklets and posters. In addition, the children and their mothers received training and education in separate sessions.⁴⁷ Gholamnia et al studied the impact of educating health-hygiene issues in control and intervention groups (through speeches, booklets, posters, and pamphlets) on head lice infestation reduction in Chabahar, Iran. Finally, head lice inspections before and 2 months after training resulted in a significant reduction in head lice prevalence in the intervention group. The present study's findings identified medicine and treatment as additional barriers to managing pediculosis.²⁰ Due to embarrassment, patients develop drug resistance as a result of

excessive and inappropriate use of anti-lice drugs.⁴⁰ Many parents buy anti-lice medicine from pharmacies without a prescription or instructions on how to take it for the duration of their children's treatment, which leads to treatment resistance due to inappropriate pharmaceutical consumption. Thus, parents of students must be educated about correct anti-lice drug use as well as the likelihood of treatment resistance.

Strengths and Weaknesses

Among studies conducted in recent decades, this is one of the few that takes a qualitative approach to the barriers and facilitators of pediculosis, which is still widespread in many areas of Iran. The study's findings might be used as academic and practical guidance for practitioners in the healthcare and education systems to take important measures against and treat the infestation at hand. It is desired that an accurate plan for regional, social, and managerial interventions will be developed to encourage people to pay attention to health issues by identifying problems and barriers to preventing and controlling epidemics based on information gathered from society and the reasons for pediculosis control. On the other hand, in order to prevent infestation from forming and re-emerging in the future, health practitioners must be prepared to regulate and avoid drug resistance in the case of pediculosis medications and medical supplies. The study's strength was the selection of diverse participants who were familiar with the case and had firsthand experience with it. As a result, the study sample comprised parents of pediculosis infested children, healthcare professionals such as physicians, family health experts, environmental health experts, and psychologists who work in health facilities, as well as health educators and instructors in schools. Besides, our research took a comprehensive approach to the issue.

Limitations

The current study has certain limitations, such as the strong social stigma associated with pediculosis, which made some participants hesitant to report their identities. Therefore, the researchers made every effort to make the participants remain incognito throughout the interview. Because there was no free access to pediculosis parents' and families' experiences, researchers had to recruit the next participants using snowball-sampling, which was a time-consuming strategy. Another constraint was the time of interviews during the COVID-19 pandemic; so, some interviews were conducted online. Finally, the last barrier is the issue of generalization.

Conclusion

The findings revealed a slew of previously unknown pediculosis control and preventive hurdles. On the contrary, the aforementioned facilitators might be used to initiate effective

interventions. According to the findings, pediculosis prevention, treatment, and possibly therapy necessitate a multimodal and multidimensional strategy. Because the identified factors are tied to the social, cultural, economic, and geographic structure, as well as family-related challenges, they play an essential role in the development of educational and managerial programs. Pediculosis control may therefore be facilitated and its high prevalence rate lowered by removing impediments, reducing the effect of barriers, employing control infestation facilitators, and reinforcing them.

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Authors' Contributions

All authors participated and approved the study design. RT and ZH contributed to design the study, AY and SFR collected the data, and analyzed by AZ. The final report and article were written by RT and NM, AZ and All authors read and approved the final manuscript.

Ethics Approval and Consent to Participate

The study was approved by the Research Ethics Committee of Hormozgan University of Medical Sciences (IR. HUMS. REC.1498.435). Written informed consent was obtained from all group members.

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