

Research Paper

Examining the Influencing Factors on Deaf Children in Treatment Procedure and Family Environment

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ABSTRACT

Objectives: This paper aims to determine the factors that affect the position of deaf children within the professional treatment procedure and family environment.

Methods: The sample consisted of 217 respondents, of which 94 were parents of deaf and hard-of-hearing children and 123 respondents were professionals. Qualitative and quantitative analyses were applied for processing the results. Testing was performed with Wilks lambda, and the tested significance in the discriminant analysis was done via the F test at the statistical significance of 0.01.

Results: The results demonstrated a relationship between the influence of the communication system and the attitude of the environment toward deaf children where the communication discriminatory factor was isolated. Insufficient information from the experts and decision-making factors in the education and rehabilitation processes are also isolated.

Discussion: The obtained results indicated that it is necessary to carry out a series of systematic activities to improve and enhance the cooperation between parents and professionals to increase the level of information of professionals and to develop better models of counseling, education, and working with parents.

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Highlights

- The choice of communication system directly affects the attitude of the environment toward deaf children.
- Statistically significant differences were found between attitudes of parents and experts in the treatment procedure on factors influencing the position of deaf children within the observed areas.
- Insufficient cooperation was noted between parents of deaf children and experts in the treatment procedure.

Plain Language Summary

Deafness in early childhood is a significant challenge for parents. Most parents without hearing impairment have no previous experience with deafness before the birth of a deaf child. For this reason, parents need the help and support of audiologists and other experts in the field of education and rehabilitation. Many factors can affect the development of a deaf child, such as family environment, way of communication, attitudes toward the environment, and so on. The mismatch of expectations and attitudes of parents and professionals can lead to insufficient results in working with deaf children. Research has shown that the preferred way of communication affects the attitudes of the environment toward deaf children. Different attitudes of parents of deaf children and experts on the factors influencing the position of deaf children have been identified; accordingly, it is necessary to carry out activities to improve their cooperation and develop better models of counseling, education, and working with parents.

1. Introduction

The introduction of neonatal screening enables early detection and diagnosis of hearing impairment, which is a basic prerequisite for timely programming of activities with deaf children and their families [1]. Early intervention is carried out through specialized programs, by competent professionals, following the child's abilities, needs, interests, and family priorities [2]. The basic precondition for successful early intervention is the expertise of professionals involved in these activities along with the involvement of parents in educational and rehabilitation processes. Rehabilitation processes play a key role in the development of the communication skills of deaf children. Working with families who choose different communication models requires specific knowledge and skills, to which experts are not always able to respond adequately [3].

Early childhood deafness is a unique and long-term challenge for parents, which includes communication difficulties, an increased need for health and audiological services, and specific educational requirements [4]. Deaf and hard-of-hearing children are mostly born in families of parents with no hearing impairment, and they usually do not have any experience and knowledge related to deafness and hearing impairment. Quittner et al. [5] shows that parents with healthy hearing can show higher levels of stress and express

negative attitudes toward their child's hearing impairment, which can be a cause of communication difficulties between parents and children. Following the diagnosis of hearing impairment in the child, the main question that arises for the parents is which method of communication to choose [6]. Parents who have no previous experience with deafness and hearing impairment, and whose preferred method of communication is oral speech [7], face a special challenge. Given that hearing impairment comes in many different levels and each has its specifics, parents and professionals must choose the method of communication that best suits the child's abilities [8].

Parents of hearing-impaired children are prone to developing more specific stressors, which include communication difficulties, selection and use of hearing aids, as well as financial needs related to hearing impairment [5]. For these reasons, parents expect well-trained experts in each segment who have the necessary skills to work with deaf children. Experts' views on this issue are divided, where deaf people are dissatisfied with rehabilitation services, and "respondents complain of a lack of professional knowledge and skills, including an inability to make an accurate diagnosis and a lack of knowledge about adequate services" [9]. In addition, the respondents stated "poor professional behavior and lack of attention to the emotional, psychological, and social effects of deafness." Interviews [10] with parents and family members of deaf children found that respondents

showed frustration with systemic barriers, including human resources and inexperienced physicians, inadequate training on how to communicate, and insufficient knowledge of methodology for working with deaf children. This is while Fitzpatrick et al. [11] shows that parents of deaf children are dissatisfied with the amount of information provided and the uncoordinated services of experts. Ching et al. [7] shows that parents required unbiased, descriptive information, and evaluative information from professionals, so that they could consider all options in making a decision that met their needs. They required continual support to implement their choices as they adjusted to their children's changing needs. Insufficient knowledge and effort of experts and the lack of understanding of the needs of deaf children can lead to poor results in the rehabilitation process.

Professionals during early intervention and diagnosis very often have a limited medical approach to deafness, while parents later discover other cultural and linguistic models and alternative approaches to understanding their children's social identity [12]. Parents, very often, leave the responsibility of decision-making to treatment professionals, during early diagnosis and intervention because of the ambiguities related to hearing impairment and hearing loss and the large amount of new information that they encounter [13].

Young et al. shows that counseling does not equally cover parents with hearing impairment and parents without hearing impairment because of language barriers in communication with parents with hearing impairment and the opinion of experts that "deaf parents and parents with hearing impairment are sufficiently

familiar with deafness as they already face this impairment and no further education is required [14]."

Families need time to develop well-informed choices regarding language, communication, methodology, and technology use -including the use of cochlear implants- and, if they have not had much exposure to deafness, time for their perceptions to evolve. These parents have no prior experience with deafness or hearing loss, and they are asked to make definitive, often life-altering choices for their deaf or hard-of-hearing children [15].

According to Kushalnagar et al. [16], inappropriate communication in the family leads to the inability to communicate with deaf children and their parents, where deaf children face social barriers, which negatively affect emotional development and progress in educational processes. Educational and rehabilitation programs should provide answers to questions related to the needs of deaf children, unique knowledge and skills needed to work with people with hearing impairments and their families, and the ability to effectively educate parents about the decision to choose an adequate way of communication.

The current research aims to establish the attitudes of experts and parents of deaf and hard-of-hearing children toward the influence factors that enable or limit the full development of deaf and hard-of-hearing children within the professional treatment procedure and family environment. The study hypothesized that there were no statistical differences in attitudes between the two groups of respondents in assessing the factors operating within the development period.

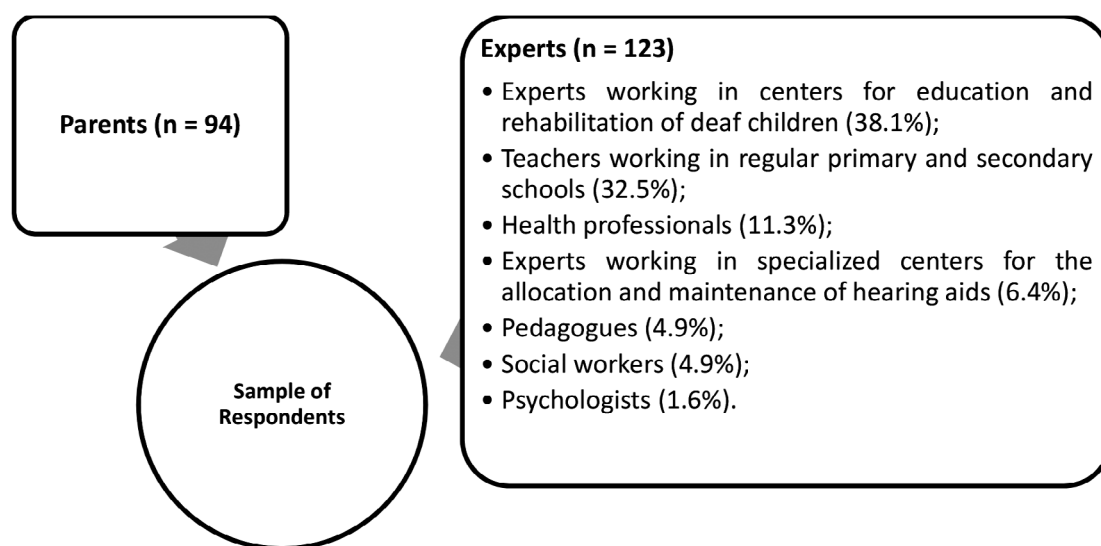


Figure 1. Sample of respondents

2. Material and Methods

Sample of respondents

The sample of respondents consisted of hearing parents and deaf parents of deaf and hard-of-hearing children (n=94) and experts in the field of diagnostics, rehabilitation, and education (n=123). The sample structure is shown in Figure 1.

Measuring instrument

The measuring instrument (Hasanbegović, 2016¹) was created to establish the respondent’s attitudes about the action of factors within the detection, diagnosis, education, and rehabilitation of deaf children to isolate the influencing factors. The development of the measuring instrument was preceded by preparatory activities related to the review of previous research and study of relevant literature, as well as analyzing the situation in the field within educational, health, and other institutions where deaf children are treated. The measuring instrument consisted of 14 statements, within

which an assessment of the institutional approach and family environment was performed.

The reliability check of the measuring instrument was performed by Cronbach α , and the reliability coefficient of the whole questionnaire was 0.82. An interview was used to check the quantitative data, for which the created questions were scaled in a Likert-based questionnaire, according to the provided answers: 1=I agree, 2=I cannot decide, and 3=I do not agree. The data was collected in direct contact with all respondents. A sign language interpreter was hired to examine the deaf respondents.

3. Results

Table 1 shows the percentage of responses of both subsamples of respondents to the offered claims. Accordingly, the attitudes of parents and experts, on the 14 offered statements within the measuring instrument, were determined and presented through 3 offered answer possibilities: “I agree,” “I cannot decide,” and “I do not agree.”

Table 1. Respondent’s answers to offered statements

Statements	Experts’ Responses (%)			Parents’ Responses (%)		
	A	CD	DA	A	CD	DA
The environment treats a deaf child as if he is incompetent and handicapped.	48.8	23.1	28.1	37.2	16	46.8
A deaf child can acquire adequate knowledge as well as hearing children.	81	9.9	9.1	75.5	5.3	19.1
Experts do not help enough in equalizing the opportunities for deaf children.	38.8	32.2	28.9	43.6	24.5	31.9
Hearing peers challenge, ridicule, and abuse a deaf child.	25.6	26.4	47.9	28.7	18.1	53.2
When the environment notices that a deaf child speaks differently, they begin to treat him as if he is different.	56.2	32.2	11.6	47.9	21.3	30.9
Parents cannot cope with the problems of their deaf children.	24.8	37.2	38	8.5	4.3	87.2
Disparaging deaf children is permanent.	24.8	31.4	43.8	11.7	23.4	64.9
The lives of deaf children are too much decided by others and decisions can harm their development.	59.5	27.3	13.2	28.7	16	55.3
Communicating with deaf children is something that bothers parents the most.	24.8	38	37.2	6.4	9.6	84
Parents have fears that their deaf children will never be able to support themselves.	59.5	22.3	18.2	30.9	13.8	55.3
Teachers and other people underestimate the abilities and capabilities of a deaf child.	33.1	19.8	47.1	22.3	30.9	46.8
Deaf children cannot succeed in life in a hearing environment.	4.1	24.5	84.3	13.8	24.5	61.7
Parents are not happy because their deaf children use sign language.	14.9	43	42.1	7.4	16	76.6
Deaf children should not be set the same rules and standards as hearing children.	32.2	18.2	49.6	25.5	19.1	55.3

A: I agree; CD: I can’t decide; DA: I don’t agree.

Table 2. Description of basic statistical parameters and t-test

Statements	Sample	AM	SD	VAR	t	P
The environment treats a deaf child as if he is incompetent and handicapped	Experts	1.79	0.85	0.732	2.49	-0.013
	Parents	2.09	0.91	0.840		
A deaf child can acquire adequate knowledge as well as hearing children	Experts	1.28	0.62	0.387	1.60	0.110
	Parents	1.43	0.79	0.636		
Experts do not help enough in equalizing the opportunities of deaf children	Experts	1.90	0.82	0.673	-0.15	0.877
	Parents	1.88	0.86	0.750		
Hearing peers challenge, ridicule, and abuse a deaf child	Experts	2.22	0.83	0.691	0.18	0.854
	Parents	2.24	0.87	0.767		
When the environment notices that a deaf child speaks differently, they begin to treat him as if he is different	Experts	1.55	0.69	0.483	2.58	0.011
	Parents	1.82	0.87	0.766		
Parents cannot cope with the problems of their deaf children	Experts	2.13	0.78	0.616	6.76	0.000
	Parents	2.78	0.58	0.341		
Disparaging deaf children is permanent	Experts	2.19	0.80	0.655	3.26	0.001
	Parents	2.53	0.69	0.488		
The lives of deaf children are too much decided by others and decisions can harm their development	Experts	1.53	0.71	0.517	6.67	0.000
	Parents	2.26	0.88	0.778		
Communicating with deaf children is something that bothers parents the most	Experts	2.12	0.78	0.610	6.88	0.000
	Parents	2.77	0.55	0.308		
Parents have fears that their deaf children will never be able to support themselves	Experts	1.58	0.78	0.611	5.77	0.000
	Parents	2.24	0.90	0.810		
Teachers and other people underestimate the abilities and capabilities of a deaf child	Experts	2.14	0.88	0.788	0.89	0.374
	Parents	2.24	0.79	0.638		
Deaf children cannot succeed in life in a hearing environment	Experts	2.80	0.49	0.244	-3.86	0.000
	Parents	2.47	0.72	0.532		
Parents are not happy because their deaf children use sign language	Experts	2.27	0.70	0.500	4.58	0.000
	Parents	2.69	0.60	0.366		
Deaf children should not be set the same rules and standards as hearing children	Experts	2.17	0.89	0.795	1.03	0.302
	Parents	2.29	0.85	0.728		

AM: Arithmetical Mean; SD: Standard Deviation; VAR: Variance.

Iranian Rehabilitation Journal

Both groups of respondents mostly disagreed on the following statements: provoking, ridiculing, abusing, and belittling deaf children; communication of deaf children with parents as the factor that bothers parents the most; underestimation of abilities and possibilities of deaf children by teachers; the inability of deaf children to adapt and to blend in a hearing environment; parents' views on the use of their deaf children's sign language and setting equal rules for deaf and hearing children.

Differences in the answers of the respondents can be observed in the claims and statements related to the following items: in the decision-making process about the life of deaf and hard-of-hearing children, too much is decided by others (experts), the environment views deaf children as incompetent, parents having fears that their deaf children cannot take care of themselves. On the following claims and statements, no discrepancies and differences in respondents' answers were found: the deaf

Table 3. Linear discriminant analysis in manifest space

Statements	Wilks Lambda	F	P
The environment treats a deaf child as if he is incompetent and handicapped.	0.972	6.207	0.013
A deaf child can acquire adequate knowledge as well as hearing children.	0.988	2.570	0.110
Experts do not help enough in equalizing the opportunities of deaf children.	1.000	0.024	0.877
Hearing peers challenge, ridicule, and abuse a deaf child.	1.000	0.034	0.854
When the environment notices that a deaf child speaks differently, they begin to treat him as if he is different.	0.970	6.648	0.011
Parents cannot cope with the problems of their deaf children.	0.823	45.768	0.000
Disparaging deaf children is permanent.	0.953	10.616	0.001
The lives of deaf children are too much decided by others and decisions can harm their development.	0.827	44.517	0.000
Communicating with deaf children is something that bothers parents the most.	0.818	47.308	0.000
Parents have fears that their deaf children will never be able to support themselves.	0.867	32.797	0.000
Teachers and other people underestimate the abilities and capabilities of a deaf child.	0.996	0.794	0.374
Deaf children cannot succeed in life in a hearing environment.	0.934	14.932	0.000
Parents are not happy because their deaf children use sign language.	0.910	21.009	0.000
Deaf children should not be set the same rules and standards as hearing children.	0.995	1.068	0.302

Iranian Rehabilitation Journal

child can acquire adequate knowledge as well as the hearing child, behavioral changes in the environment when noticing a deaf child with different communication skills, insufficient engagement of experts in equalizing the opportunities of deaf children.

Table 2 presents the basic statistical parameters: arithmetic means (AM), standard deviations (SD), and variances for both subsamples of respondents. According to the obtained data, the experts agreed with the following statement the most: “deaf children cannot succeed in life in a hearing environment” (AM=2,80), while the calculation of SD indicates average deviations from AM ranging from 0.49 for the same statement to 0.89 for the statement, “deaf children should not be set under the same rules and standards as hearing children.” The greatest agreement of the responses of the subsamples of the parents was obtained on the statement, “parents cannot cope with the problems of their deaf children” (AM=2.78). By calculating SD, it can be seen that the average deviations from AM for this subsample of respondents range from 0.55, “communicating with deaf children is something that bothers parents the most,” up to 0.91 for the statement, “the

environment treats a deaf child as if he is incompetent and handicapped.”

In addition, the results of the t-test are presented, where statistical significance at the level of 0.01 is defined. The results of the t-test indicate a statistically significant difference in AM of the respondent's responses to the following statements: “parents cannot cope with the problems of their deaf children” (t=6.76); “the lives of deaf children are too much decided by others and decisions that can harm their development” (t=6.67); “communicating with deaf children is something that bothers parents the most” (t=6.88); “parents have fears that their deaf children will never be able to support themselves” (t=5.77); “deaf children cannot succeed in life in a hearing environment” (t=-3.86); and “parents are not happy because their deaf children use sign language” (t=4.58).

The discriminant analysis was used for further data processing. The testing was performed with Wilks lambda. The tested significance in the discriminant analysis was done via the F-test. Table 3 shows the statistical significance of Wilks lambda, where it is observed that the subsamples of respondents show statistically signifi-

Table 4. Correlation coefficient and statistical significance of the isolated discriminant function

Coefficient	Variant (%)	Cumulative (%)	Linear Correlation	Wilks Lambda	χ^2	d_f	P
992 ^a	0.100	0.100	0.706	0.502	141.597	15	0.000

Iranian Rehabilitation Journal

cant differences in the attitudes on the following statements: “parents cannot cope with the problems of their deaf children,” “the lives of deaf children are too much decided by others and decisions that can harm their development,” “communicating with deaf children is something that bothers parents the most,” “parents have fears that their deaf children will never be able to support themselves,” “deaf children cannot succeed in life in a hearing environment,” and “parents are not happy because their deaf children use sign language.”

Concerning the magnitude of the F coefficient, the highest value was highlighted in the statement, “communicating with a deaf child is something that bothers parents the most” ($F=47,308$), where the largest difference was observed in the responses of subsamples.

To assess the differentiation of groups based on the corresponding discriminant function, the coefficient of discrimination was calculated at 0.706. The Wilks lambda was tested using the Chi-square test with a degree of freedom of ($d_f=15$) and the statistical significance is at the level of $P=0.00$. The value of the Bartlett Chi-square test of the discriminant variable Chi-Square. Amounts to 141 597. This value is higher than the limit value at 15 degrees of freedom with a significance level of $P=0.00$; therefore, it can be concluded that there is a statistically significant difference for discrimination of groups at the significance level of $P<0.01$. Based on the canonical correlation coefficient $R=0.706$, it is possible to form a statistically significant discriminant function in the space of statements to determine differences in attitudes between two groups of respondents at a significance level of $P<0.01$ (Table 4).

4. Discussion

According to the results obtained by discriminatory analysis, insight was provided into the differences in the attitudes of the subsamples of parents and experts in the treatment procedure. The isolated discriminatory factor in the statement, “parents cannot cope with the problems of their deaf children,” clearly indicates the existence of problems in cooperation and communication between parents and experts. These attitudes of experts may be caused by their dissatisfaction when

it comes to the involvement and work of parents with their deaf children at home, as well as the overprotective and unrealistic attitude of parents toward deaf children. Insufficient information and education of parents, inadequate support system, the disorganization of the health system, and educational and social sectors can also be the cause of this situation. Although the problems faced by parents of deaf children are present and evident, no effort is seen in the professional treatment approach to change this situation. On the other hand, activities related to diagnosis, rehabilitation, education, and counseling require additional effort and commitment of parents in the form of overcoming initial stress and reaction to the birth of a deaf child, absences from work, financial benefits, placement in foster families, or relocation where there are centers for education and rehabilitation of deaf children, which requires organized support to families of deaf children.

The following statement was also isolated by discriminatory analysis: “the lives of deaf children are too much decided by others and decisions that can harm their development.” Parents of deaf children and experts in the treatment process participate equally in working with deaf children and their success and progress largely depend on their compliance and application of appropriate, most acceptable methods of work with children. The obtained results indicate the presence of a serious problem due to their lack of coherence in the decision-making process. According to Umar and Muhammad [17], deaf boys have emotional problems in adolescence, such as anxiety, social immaturity, aggression, and poor understanding of their own and others’ emotions because of communication difficulties and unacceptable attitudes toward society. Their research reveals that the dominant attitude of parents and taking all decisions regarding education, entertainment, and social interaction, as well as insufficient involvement of the child and respect for its wishes and attitudes, contribute to the development of dissatisfaction and undesirable behaviors. In contrast, the powers of professionals in the treatment process are limited and the final decisions on all aspects of a deaf child’s life are made by the parents, who very often disregard the instructions provided by the experts. It is understandable to expect that parents of deaf

children, because of subjective and sometimes over-protective attitudes, can make independent decisions, which in the long run will not give adequate results. It is necessary through a systematic and professional approach, involving parents in direct work with professionals and the deaf child to change such attitudes.

Further analysis isolated the statements, “communicating with deaf children is something that bothers parents the most” and “parents are not happy because their deaf children use sign language.” Although experts cite parents as the most important factor in achieving education, the results of overall rehabilitation, given the time children spend with parents, based on the results it can be concluded that experts are insufficiently informed with regards to a significant segment of work that relates to communication. This can result in the wrong orientation of the support system and programming activities with children and parents. The obtained data is in accordance with the study of Mitchell et al. and Eleweke & Rodda [15, 18] in which, the parents state that they do not have adequate support in terms of making decisions related to the selection of an appropriate communication model. Spencer et al. [19] shows that parents with healthy hearing who have deaf children are more persistent and direct, even intrusive, with regards to establishing communication with deaf children, but at the same time show less compliance for the child’s needs for visual and tactile exploration of the environment [20]. The results of the study of Zaidman-Zait [21] show that communication difficulties between parents and deaf children are the primary cause of stress for parents, with 38.7% of parents saying that they are not always able to understand their children’s speech, which often causes frustration in parents as they use different communication systems than their deaf children. The same author further states that the wishes of parents to communicate through oral speech are in complete contradiction with the wishes of their deaf children who use sign language to communicate with the environment.

Results obtained on an isolated statement “parents have fears that their deaf children will never be able to support themselves and take care of themselves” can be associated with difficulties in financial independence and the deaf people’s ability to take care of themselves and have an independent life. Parents cite communication difficulties and worries about the future of their deaf children as the main stressors [4]. Justifications for parents’ fears for the future and independence of their deaf children can be found in the statement that experts often do not forecast the progress of the deaf

child, which is in line with the study of Mitchell et al. [15]; the research maintains that parents often express dissatisfaction because experts do not provide prognostic information about the children’s abilities, while Neuss states that clinicians are not aware that parents want such information or that they do not have prognostic indicators based on experience and practice in working with deaf people [22]. The results of the study of Jamieson and Zaidman-Zait [23], show that parents of deaf school-age children express concern about the educational opportunities of deaf children and independence and self-care and express the need for information related to their cognitive and socio-emotional development. Different results are found in the study of Crowe et al. [8], which states that parents of deaf children show extremely positive attitudes toward the abilities of deaf adults, especially on claims that describe their intellectual and professional abilities.

5. Conclusion

The results of the research showed a relationship between the influence of the communication system and the attitude of the environment toward deaf children, whereby the communication discriminatory factor is isolated. The biggest challenge for parents is to choose the most acceptable communication system, which corresponds to the child’s abilities and to the requirements that the family puts before the deaf child. The research also found that there is insufficient cooperation between parents of deaf children and experts in the treatment process, which is reflected in poor information of experts in terms of parental expectations, communication between parents and deaf children, decision-making process that is important for deaf children, parents fear for the independence of their deaf children, the possibility of success and adaptation of deaf children in a hearing environment, and the use of sign language as one of the communication systems. With insight into the above statements, which are isolated by discriminatory analysis, it can be concluded that these are the key factors that need to be considered when programming educational and rehabilitation procedures for deaf children. The results indicate that it is necessary to work on changing such attitudes through a systematic and professional approach, involving parents in direct work with experts and the deaf child itself. Based on the obtained information, it can be concluded that it is necessary to carry out activities of additional training of experts, which would aim to develop better models of counseling, education, and work with parents.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article. The participants were informed of the purpose of the research and its implementation stages, after which their written consent for participation in the research was obtained. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished, and if desired, the research results would be available to them.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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