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# Psychological status in children with ear and nose foreign body insertion

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ABSTRACT

*Objective:* Children with psychological disorders are prone to various unintentional injuries, one of the most common of which is foreign body inserting. In spite of the high incidence, the association is not studied yet.
*Methods:* This is a case control study in otorhinolaryngology and psychology departments, at a tertiary referral teaching hospital. One hundred five children (2–12 years old) who were referred for removal of foreign bodies in their ear or nose over a period of one year were selected for the study. Also, 155 children were selected and matched from the same community as the controls. Parents were given the standard strengths and difficulty questionnaire (SDQ) for psychological evaluation of their child. The total score and also the subscales for emotional symptoms, hyperactivity disorders, conduct problems, peer-relationship problemsand prosocialbehaviors were recorded and statistical analysis was performed.
*Results:* In the case group, 34 cases (%32.4) were suffering from foreign bodies in their ear, 70 cases (% 66.7) in their nose, and just one case (%1) in both. Age and sex distributionin the two groups were comparable. There were significant differences of SDQ scores between the two groups in total score ($p < 0.001$), emotional symptoms ($p < 0.001$), hyperactivity disorders ($p < 0.001$), conduct problems ($p < 0.001$), and prosocial behaviors ($p < 0.001$). However peer-relationship problems showed no significant difference between the two groups ($p = 0.161$).
*Conclusion:* Psychological problems are more common in children with foreign bodies than the controls. Thus physicians are recommended to consider referring these patients to the pediatric psychologist.


## 1. Introduction

The term 'foreign body' describes an object or piece of extraneous matter that has entered the body and is not intended to be there. Thus, the foreign body should be removed, otherwise it may cause serious harm. Globally, foreign bodies are very common among small children, who tend to put objects in their mouth, nose or ears, and these cases should be dealt with as an emergency [1]. On average, 11% of emergency cases are associated with a foreign body in the mouth, ear, or nose [2], mostly in children [3–7], with foreign bodies in the ear and nose being the most common manifestations [2,3,8].

Although awareness of symptoms and complaints associated with foreign bodies, rapid and appropriate intervention, and the introduction of measures to prevent children from putting objects into their ear and nose minimizes risk of morbidity and complications, a high rate of mortality and morbidity among children remains from these incidents. Approximately 2700 children under the age of 5 years died in 2001 due to unintentional injuriesin the United State, and 2.4 million children were seriously hurt with stable non-fatal injuries. Further, 4600 children endangered themselves though unintentional injuries per week, with statistics showing 6600 injuries each day on average [9]. Moreover, children under 5 years of age suffer proportionally greater consequences of

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injury compared with older children and adults [10].

On the other hand, pediatric psychiatric disorders are also shown to have a sizeable prevalence in the entire world and in Iran, 7–30% of children are reported to suffer from psychiatric disorders [11–18]. Moreover, the incidence of psychiatric disorders is progressively increasingall over the world, and maybe an indication of social burden and disability [15].

The incidence of unintentional injuries such as fractures, burns, head injuries, and poisoning among children suffering from psychiatric disorders has been widely assessed [18–23]. Examination of the relationships between prevalent psychiatric disorders and unintentional injuries shows that children with attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) predominantly suffer from burns, poisoning, and fractures [19]. Furthermore, children with ADHD require more medical care [24].

A large number of studies have been published regarding the removal of foreign bodies [1–5,8,25–34]. Although foreign bodies and their consequences may lead to morbidity and mortality, the relationship between psychiatric disorders and the percentage of accidents occurring as a result of foreign bodies entering the body has not yet been assessed.

Therefore, because of the high incidence of unintentional injuries and foreign-body incidents among children with psychiatric disorders, and the lack of studies examining the relationship between these two factors, the present study was conducted.

## 2. Materials and methods

The target population of the current study was children (aged 1–16 years) who were referred to Imam Reza and Ghaem Hospitals for the removal of foreign bodies from the ears or nose between December 2013 and December 2014. Parents of participants whose foreign bodies were successfully removed were given a Strengths and Difficulties Questionnaire (SDQ), and completed questionnaires were analyzed by a psychiatrist based on psychiatric symptoms.Children referred to the hospital with symptoms of foreign bodies but in whom no foreign bodies were found, children whose parents did not complete the questionnaire, and children who had been maltreated (child abuse cases) were excluded from the study.The control group consisted of children from kindergartens located in the same city, Mashhad.

The SDQ questionnaire evaluates behavioral and emotional problems and takes around 20–30 min to complete. The questionnaire has been broadly applied in different cultures [35–37], and the validity and reliability of the Persian version have also been confirmed [38–40]. This questionnaire asks questions over 25 attributes which are divided into five scales: emotional symptoms, conduct problems, hyperactivity, peer-relationship problems, and prosocial behavior and the results are reported as normal, borderline or abnormal.

SPSS 16 was utilized to analyze the SDQ datain addition to age, sex and parents education level in both groups. Appropriate descriptive tables and diagrams, chi-square and Mann-Whitney tests were also used for comparison of data. P values under 0.05 were considered significant.

Children referred to the hospital with symptoms of foreign bodies but in whom no foreign bodies were found, children whose parents did not complete the questionnaire, and children who had been maltreated (child abuse cases) were excluded from the study.

## 3. Results

The case group consisted of 105 individuals with foreign body, of whom 54 were male (51.4%) and 51 were female (48.6%). The children studied ranged from 2 to 12 years in age (mean, 4.16 ± 2.06 years).

The control group also included 156 individuals, of whom 80 were male (51.3%) and 76 were female (48.7%). Participants ranged from 2 to 9 years of age (mean, 4.20 ± 1.11 years).

No statistically significant differences in age or gender existed between the patients and the controls. (P-value for sex = 0.981, P-value for age = 0.846).

Among 105 children referred to the hospitals, 34 cases (32%) were suffering from foreign bodies in their ear, 70 (67%) had a foreign body in the nose, and just one case (1%) had foreign bodies in both the ear and the nose.

The educational level of the children's fathers and mothers were divided to under diploma and diploma or higher (Table 1); and the two groups were significantly different in this regard (p-value < 0.001).

Psychological evaluation (Chi-square test) with SDQ questionnaire shows that there are significant differences between the two groups in 4 subscales (emotional symptoms, conduct problems, hyperactivity, and prosocial behavior) but not in the peer-relationship score (Table 2).

**Table 2**
Frequency distribution of Psychological problems according to SDQ questionnaire in the case and control groups.

| Psychological problem | | Case | Control | P-value |
|---|---|---|---|---|
| Emotional | Normal | 64 (61%) | 139 (89.1%) | <0.001 |
| | Borderline | 19 (18%0 | 10 (6.4%) | |
| | Abnormal | 22 (21%) | 7 (4.5%) | |
| Conduct | Normal | 50 (47.6%) | 123 (78.8%) | <0.001 |
| | Borderline | 7 (6.7%) | 19 (12.2%) | |
| | Abnormal | 48 (45.7%) | 14 (9%) | |
| Hyperactivity | Normal | 52 (49.5%) | 139 (89.1%) | <0.001 |
| | Borderline | 18 (17.1%) | 4 (2.6%) | |
| | Abnormal | 35 (33.3%) | 13 (8.3%) | |
| Peer | Normal | 69 (65.7%) | 110 (70.5%) | 0.161 |
| | Borderline | 12 (11.4%) | 24 (15.4%) | |
| | Abnormal | 24 (22.9%) | 22 (14.1%) | |
| Social | Normal | 58 (55.2%) | 141 (90.4%) | <0.001 |
| | Borderline | 38 (36.2%) | 8 (5.1%) | |
| | Abnormal | 9 (8.6%) | 7 (4.5%) | |
| Total Score | Normal | 36 (34.3%) | 132 (84.6%) | <0.001 |
| | Borderline | 31 (29.5%) | 19 (12.2%) | |
| | Abnormal | 38 (36.2%) | 5 (3.2%) | |

**Table 1**
The clinical and epidemiological characteristics of the study and control groups.

| | | | Case | Control |
|---|---|---|---|---|
| Number | | | **105** | **156** |
| Male/Female | | | **54/51** | **80/76** |
| Mean age | | | 4.16 ± 2.06 years | 4.20 ± 1.11 years |
| Parents education level | Father | Under diploma | 61 (58%) | 36 (23%) |
| | | Diploma or higher | 44 (42%) | 120 (77%) |
| | Mother | Under diploma | 82 (78.1%) | 41 (26.3%) |
| | | Diploma or higher | 23 (21.9%) | 115 (73.8%) |

**Table 3**
The SDQ results according to the mothers' education level.

| Psychological problem | | | Case | Control | P-value |
|---|---|---|---|---|---|
| Emotional | Under Diploma | Normal | 52 (63.4%) | 34 (82.9%) | 0.077 |
| | | Borderline | 16 (19.5%) | 3 (7.3%) | |
| | | Abnormal | 14 (17.1%) | 4 (9.8%) | |
| | Diploma or higher | Normal | 12 (52.2%) | 105 (91.3%) | <0.001 |
| | | Borderline | 3 (13%) | 7 (6.1%) | |
| | | Abnormal | 8 (34.8%) | 3 (2.6%) | |
| Conduct | Under Diploma | Normal | 44 (53.7%) | 35 (85.4%) | 0.001 |
| | | Borderline | 6 (7.3%) | 3 (7.3%) | |
| | | Abnormal | 32 (39%) | 3 (7.3%) | |
| | Diploma or higher | Normal | 6 (26.1%) | 88 (76.5%) | <0.001 |
| | | Borderline | 1 (4.3%) | 16 (13.9%) | |
| | | Abnormal | 16 (69.6%) | 11 (9.6%) | |
| Hyperactivity | Under Diploma | Normal | 44 (53.7%) | 35 (85.4%) | 0.001 |
| | | Borderline | 14 (17.1%) | 0 (0%) | |
| | | Abnormal | 24 (29.3%) | 6 (14.6%) | |
| | Diploma or higher | Normal | 8 (34.8%) | 104 (90.4%) | <0.001 |
| Peer | Under Diploma | Normal | 60 (73.2%) | 25 (61%) | 0.002 |
| | | Borderline | 3 (3.7%) | 10 (24.4%) | |
| | | Abnormal | 19 (23.2%) | 6 (14.6%) | |
| | Diploma or higher | Normal | 9 (39.1%) | 85 (73.9%) | 0.002 |
| | | Borderline | 9 (39.1%) | 14 (12.2%) | |
| | | Abnormal | 5 (21.7%) | 16 (13.9%) | |
| Social | Under Diploma | Normal | 43 (52.4%) | 34 (82.9%) | 0.001 |
| | | Borderline | 32 (39%) | 3 (7.3%) | |
| | | Abnormal | 7 (8.5%) | 4 (9.8%) | |
| | Diploma or higher | Normal | 15 (65.2%) | 107 (93%) | 0.001 |
| | | Borderline | 62 (68%) | 5 (4.3%) | |
| | | Abnormal | 2 (8.7%) | 3 (2.6%) | |
| Total Score | Under Diploma | Normal | 30 (36.6%) | 29 (70.7%) | <0.001 |
| | | Borderline | 27 (32.9%) | 11 (26.8%) | |
| | | Abnormal | 25 (30.5%) | 1 (2.4%) | |
| | Diploma or higher | Normal | 6 (26.1%) | 103 (89.6%) | <0.001 |
| | | Borderline | 4 (17.4%) | 8 (7%) | |
| | | Abnormal | 13 (56.5%) | 4 (3.5%) | |

As mentioned before, the parents' education level was different between the 2 groups; on the other hand, parents' education can potentially affect the children's psychological state. In order to adjust the confounding role of parents' education, the analysis was stratified based on the mothers' education level (Table 3). This analysis shows that there are significant differences between the two groups in all parameters except for the emotional state of children with under-diploma mothers.

## 4. Discussion

Foreign bodies are very common in small children, who put things in their mouth, nose or ears, and should be dealt with as an emergency [1]. On average, 11% of emergency cases are associated with foreign bodies in the mouth, ear and nose [10], mostly among children [3–7]. Foreign bodies are most common in the ear or nose [2,3,8]. The incidence of unintentional injuries such as fractures, burns, head injuries, and poisoning in children suffering from psychiatric disorders has been widely assessed [18–23], however, the frequency of psychiatric disorders in the cases with foreign bodies has not yet been assessed. In the reviewed literature, only three studies were identified in which the relationship between the incidence of ADHD and the frequency of foreign bodies in the ear and nose were investigated [26,41,42]. No other studies were found.

In the current study, the highest frequency of ear and nose foreign body is observed in male children less than 5 years of age. The frequency of foreign bodies in the nose was greater than that in the ear. The most common finding was conduct problems, and the least common was prosocial behavior. Emotional symptoms were most prevalent in female children and hyperactivity was most prevalent in male children. The frequencies of conduct problems, peer-relationship problems, prosocial behavior, and total score were higher among patients whose fathers' had a lower educational level. The frequencies of conduct problems, peer-relationship problems, and total score were also higher in patients whose mothers' had a low educational level. Therefore this study showed the higher score of psychiatric symptoms among children with nose and ear foreign body insertion even when parenteral educational level is controlled by statistic methods.

Perera et al. (2009) conducted a study over a 3-month period and examined 34 children between 3 and 10 years of age suffering from a foreign body in their ear or nose. The average age in this study was 4.8 years (SD, 2.06 years). The data showed that 65% of patients were 5–6 years old, 18% were 5–7 years old, and 18% were 8–10 years old [26]. Clenk et al. (2013) carried out a study to examine 60 children aged 3–9 years suffering from a foreign body in their ear or nose. The Conners' Parent Rating Scale (CPRS) and Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) were utilized to compare these children with 50 children in the control group. The mean age was 4.4 ± 1.5 years, and 38 patients were in the 3–4 year age group and 22 patients were in the 5–9 year age group [41]. Kemal Ozcan (2013) conducted a study to assess 45 children (31 male, 14 female) suffering from a foreign body in their ear or nose, as well as 37 healthy children (22 male, 15 female) as the control group. The CPRS questionnaire was utilized in this study. In total, 56% of children did not go to school or kindergarten, 13% were preschoolers, and 31% went to school. Finally, the mean age of the children was 5.58 ± 1.67 years [42]. The population in the present study consisted of 105 children, ranging from 2 to 13 years of age. The mean age of participants was 4.17 (SD, 2.11) years. Thus, the mean age of the children in the present study is comparable with those reviewed from the literature.

Among 105 children who were examined in the current study, 34 cases (32%) were suffering from foreign bodies in their ear, 70 (67%) in the nose. This was s consistent with Perera study, which showed that nose was the prevalent location for foreign body. In contrast, in the studies carried out by Clenk, foreign bodies in the ear were more frequent.

In the present study, the frequency of emotional symptoms, conduct problems, hyperactivity, peer-relationship problems, prosocial behavior, and total score were respectively measured at 21%, 46%, 33%, 30%, 9%, and 36%. A study was conducted by Mohammadi et al. (2013) with regard to psychiatric symptoms in Iranian children. This was a cross-sectional study based on the SDQ questionnaire assessing 5127 teenagers in the 12–17 age groups in Tehran, KhorassanRazavi, Isfahan, AzarbaijanSharghi and Fars provinces. The most frequent psychiatric symptoms were related to conduct problems (24%), while the least common were related to prosocial behavior (6%). The frequencies of other scales such as emotional symptoms, hyperactivity, and peer-relationship problems were 8%, 14%, and 7%, respectively. Heirani et al. used the SDQ questionnaire and reported the highest score for peer-relationship problems (%44.4). Conduct problems, prosocial behavior, emotional symptoms, and hyperactivity followed in descending order, as follows: 44%, 2%, 16%, and 6%. The total score for abnormality was seen in 34% of the individuals. Perera et al. also applied the SDQ questionnaire and reported hyperactivity, emotional symptoms, conduct problems, and total scores as 37%, 0%, 41%, and 47%, respectively. Thus, in all reviewed studies, except that by Heirani et al., the highest frequency was reported for conduct problems, and the lowest for prosocial behavior. This finding is consistent with the current study.

## 5. Conclusion

Psychological problems seem to be more common in children with foreign bodies than the controls. Referring these patients to the pediatric psychologists may be indicated in certain circumstances. Moreover, those with psychological problems are prone to foreign body insertion, so suitable measures should be taken to prevent them from putting foreign bodies in their nose or ears.

## Financial interest

None.

## Compliance with ethical standards

This study has been approved by the ethical committee of Mashhad university of Medical Sciences and informed consent was obtained from all individual participants included in the study.

## Conflict of interest

The authors have no conflict of interests!

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