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The Reconnaissance of Iranian Adolescent's Perceptions of Radiology Imaging Process

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Abstract

Background

Since adolescents do not frequently refer to pediatricians or even general practitioners, hospitals and clinical standard systems are not designed to meet their needs. Therefore, the present study aimed to identify adolescent's views and feelings of the X-ray imaging process, suggest some age-appropriate facilities to respond to their needs to have a good experience of attending to radiology centers and appropriate interactions between middle adolescents and radiographers.

Materials and Methods: In this cross-sectional study, 60 adolescents (30 girls and 30 boys) from four secondary schools participated in the study. Their opinions and feelings regarding the waiting room, the imaging room, and their interactions with the radiographers were collected using the completed questionnaire. The questionnaire has been created by the Irish researcher (Davis), and its validity and reliability have been examined.

Results: The major complaints of adolescents (36.7%) was the lack of comfortable seats in the waiting room. They preferred watching TV in the waiting room to play music. None of the adolescent girls were nervous in the X-ray room, and 13.3% of boys stated that they were nervous. Twenty-two of the adolescents said the radiographer was quiet. 10% of girls stated that the radiographer was quite rough in dealing with them; however, none of the boys made such a statement.

Conclusion

The results showed that adolescents do not receive optimal care during X-ray imaging. It was suggested that age-appropriate educational posters to be installed on the wall, and television programs to be displayed in the radiology departments, as well as training courses on how to interact with adolescents for radiographers.

Key Words: Adolescent, Radiographer, X-Ray Imaging, Waiting Room.

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1- INTRODUCTION

Middle adolescents, because of different psychological and physiological features, are different from early and late adolescents. During the middle adolescence, they experience various changes in their lives compared to early or late adolescence. This means that middle adolescents expose to specific challenges to clinicians and the health care system as their morphological, physiological, and social characteristics are different from those of younger children and adults (1, 2). Recent studies have shown that clinicians such as radiographers have little information about adolescent's psychology, while they encounter some adolescents in the clinic daily. However, hospitals and clinical standard systems are not designed to meet their needs (3-5).

Rare studies have investigated children's perceptions of the X-ray imaging process, and a limited number of them are about middle adolescents (adolescents with 15-17 years old) (6-9). There have been no studies regarding Iranian adolescent's awareness of X-ray imaging (1, 10, 11). The purpose of this study was to identify adolescent's views and feelings of the X-ray imaging process, suggest some age-appropriate facilities to respond to their needs to have a good experience of attending to radiology centers, and appropriate interactions between middle adolescents and radiographers.

2- MATERIALS AND METHODS

The present study is a descriptive-analytic study, which aimed to reconnaissance Iranian adolescent's perceptions of the radiology imaging process. This study was cross-sectional conducted on Iranian adolescents in Ahvaz city, Iran. Four secondary schools, two boy's schools, and two girl's schools in Ahvaz city were selected based on the agreement of their school's principals. Students who had the inclusion invited voluntarily (30 girls and 30 boys). The sample size was calculated according to the following formula:

$$n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{\beta})^2}{(\frac{1}{2}\ln\frac{1+r}{1-r})^2} + 3$$

$$n = \frac{(1.96 + 0.84)^2}{(\frac{1}{2}\ln\frac{1+0.36}{1-0.36})^2} + 3 = 59$$

$$z_{1-\frac{\alpha}{2}} = 1.96$$

$$z_{\beta} = 0.84$$

The sample size was determined to be 60 individuals using the mentioned formula with a confidence level of 80% and considering the lowest correlation coefficient with the previous studies (r=0.36) (12).

The sampling method was random. In this way, the researcher referred to the schools of Ahvaz and with the permission of the school principal. First, they discussed a sufficient explanation about the purpose of the study and how the subjects can participate. Afterward, their questions were answered. After obtaining the informed consent, the questionnaires were given to adolescents who had radiographic imaging in the past year (experience of performing radiological images at least once), and they completed the questionnaires. The questionnaire was designed by Irish researchers (Shea and Davis in 2015) (12). Since they had a pilot study to confirm the questionnaire, there was no need to carry out the pilot study in this study (13). The questionnaire contained four sections. The first section contained biographical information such as age, gender, and student's educational level, in the 2-4 sections, the student's feelings and opinions about each stage of the X-ray imaging process (waiting room, imaging room, and radiographer) was

asked. The questionnaire took approximately 20min to be completed. Closed questions featured heavily, using yes/no and multiple choice answers. Closed questions provided uniformity of responses and are simple to process. Open-ended questions were also featured. They provided the respondents with freedom and allowed them to write their answers (14, 15). The feelings and opinions of adolescents are presented in the Tables. The researcher applied and obtained ethical approval from Ahvaz Jundishapur University of Medical Sciences Research Ethics Committee. The principals of the two schools were formally contacted using the email to inform them about the nature and the aim of the study and to seek permission to recruit participants. The inclusion criteria of the study were adolescents with 15-17 years old, at least one X-ray test during the last year, and the signed informed consent. Afterward, data were entered into SPSS software version 22.0 and were compared and analyzed statistically.

3- RESULTS

The opinion of the participants regarding the waiting room, the imaging room, and their interactions with the radiographers was collected using completed questionnaires. In **Table.1**, participants expressed their feelings about the waiting room. Most of the adolescents were worried about the process of X-ray imaging (33.3% of girls and 26.7% of boys). Just 3.33% of the girl described that they were nervous because of pain on their leg. Adolescents had different opinions about the waiting room and the available facilities, as shown in **Table. 2**.

Table-1: Adolescents' feelings in the waiting room.

Feelings	Number of adolescents Yes
Relaxed	17 (28.33%)
Anxiety	18 (30%)
Excited	11 (18.33%)
Serious	5 (8.33%)
Curious	16 (2.66%)
Fear	12 (20%)
Attractive	2 (3.33%)
Confident	8 (13.33%)
Annoyed	3 (5%)
Nervous	1 (1.66%)
Embarrassed	2 (3.33%)
Pain	5 (8.33%)

Table-2: Adolescents' opinions of the waiting room.

Opinions	Number of adolescents Yes
Long waiting time	15 (25%)
Absence of age appropriate magazines in waiting room	13 (21.66%)
Too many posters on the wall of the waiting room	2 (3.33%)
TV in the waiting room	8 (13.33%)
TV unavailable in waiting room	10 (16.66%)
Music in the waiting room	4 (6.66%)
No music in the waiting room	15 (25%)
Comfortable chair in waiting room	12 (20%)
No comfortable chair in waiting room	22 (36.66%)
Boring	19 (31.66%)
Dark	5 (8.33%)
Noisy	14 (23.33%)
Quiet	6 (10%)
Cold	8 (13.33%)
Warm	3 (5%)
Stressful	16 (26.6%)
Smelly	1 (1.66%)
Colorful	0
Comfortable	10 (16.66%)

The major complaint of adolescents was the lack of comfortable seats (43.3% of girls and 30% of boys) in the waiting room, and they stated that the waiting room was boring (26.7% of girls and 36.7% of boys) and stressful (33.3% of girls and 20% of boys). Adolescents preferred watching TV (13.3% of girls and 13.3% of boys) in the waiting room to play music (3.33% of girls and 10% of boys). **Table. 3** shows adolescents' feelings in the X-ray room. According to their statements, the perceived pain of adolescents during imaging mostly depends on their position during the process. Numerous adolescents felt good about the interesting radiological equipment in the X-ray room (40% of girls and 53.3% of boys). None of the girls were nervous in the X-ray room, and 13.33% of boys were nervous since they cannot play football for a while.

Table-3: Adolescents' feelings in the X-ray room.

Feelings	Number of boys Yes	Number. of girls Yes	P-value
Pain	5 (16.66%)	7 (23.33%)	0.374
Nervous	4 (13.33%)	0	0.056
Attractive and interesting process	13 (43.33%)	9 (30%)	0.211
Interesting radiological equipment	12 (40%)	16 (53.33%)	0.219
Interesting radiograph	7 (23.33%)	10 (33.33%)	0.284

The adolescents' opinions on radiographers are presented in **Table. 4**. 36.6% of the adolescents stated that the radiographer was quiet, and 30% of also noted that the radiographer was impatient. 10% of girls said that the radiographer was quite rough in dealing with them; however, none of the boys made such a statement. 36.6% of adolescents stated that the radiographer was silent, and just 3.33% of the girl said the radiographer was chatty, and 30% of adolescents said that radiographer was impatient. In **Table. 5**, adolescents respond to questions about the amount of information that the radiographer gave them.

Table-4: Adolescents' opinions of the radiographer.

Opinions	Number of adolescents Yes
Impatient	18 (30%)
Sympathetic	8 (13.33%)
Warm	11 (18.33%)
Chatty	1 (1.66%)
Quiet	22 (36.66%)
Quite rough	3 (5%)
Rushed	13 (21.66%)
Understanding	13 (21.66%)
Friendly	12 (20%)

Table-5: Items that show that the radiographer was interacting with the adolescent.

Item	Yes	No
Did the radiographer explain what the X-ray examination involved?	26 (43.33%)	34 (56.66%)
Did the radiographer explain to you where you will get your results of the X-ray examination?	48 (80%)	12 (20%)
Did the radiographer explain to you how you will get your results of the X-ray examination?	30 (50%)	30 (50%)
Did the radiographer explain to you when you will get your results of the X-ray examination?	40 (66.66%)	20 (33.33%)

4- DISCUSSION

Only 25% of adolescents stated that they had spent a long time before imaging in the waiting room. A total of 31.6% of adolescents reported that the waiting room was boring, and 21.6% of adolescents reported that there were not any age-related magazines in the waiting room, which is consistent with the results of the studies conducted by O'Shea et al. and Tivorsak et al. (13, 16). Male adolescents (23.3%) in the waiting room had higher self-esteem compared to female adolescents (3.3%), which was significant. Four boys (13.3%) were nervous in the imaging room, and none of the girls felt nervous in the imaging room, which the difference was significant.

The adolescent's opinion was asked regarding their changes in the waiting room, 16.7 % of adolescents showed interest in the provision of television sets and 6.7% of students to play music in the waiting room. The studies of O'Shea et al. and Smith also support adolescence' views in this study, which believe age-appropriate facilities should be provided for adolescents in hospitals (13, 17). The provision of journals and press releases for adolescents can distract them from the pain and help them to pass the time before the X-ray imaging process.

Nevertheless, type of music or magazines is a problem because the younger adolescents and children usually prefer to access some toys in the waiting room. However, a study by O'Shea et al. stated that a large number of adolescents had to spend a long time in the waiting room, and they were bored (12). 36.7% of adolescents stated that the X-ray imaging process is interesting. 46.7% of students were interested in the radiological equipment in the X-ray room, which is probably because of the over-curiosity of adolescents. 20% of adolescents reported that they had pain during the X-ray imaging process because of improper positioning. Only 11.1% of adolescents expressed that they were nervous in the X-ray room that seems to be related to their lack of information about the X-ray imaging process. In comparison, about half of the participants of the study of O'Shea et al. stated that they were nervous in the imaging room (12). According to the results of the present study, adolescents might have more information about the X-ray imaging process compared to the Irish adolescents in O'Shea et al.'s study. 36.7% of adolescents said that the radiographer was quiet. 30% of adolescents stated that the radiographer was impatient, but in a study by O'Shea et al., just one adolescent said the radiographer was quiet (12).

Only 5% of adolescents stated that the radiographer was rushed them, and this may be due to the large number of patients referred to the radiology center. According to Table. 5, the interactions between the adolescents and the radiographer were not satisfactory. 56.7% of adolescents stated that the radiographer did not know informed them with on X-ray imaging, while in O'Shea et al.'s study, only 5% of adolescents were dissatisfied, and the majority of adolescents had a positive experience of interacting with radiographers.

Suitable information for adolescents about different types of X-ray imaging that are not usually accessible can make adolescents more relaxed before imaging, and this information can be either health education pamphlets or appropriate websites or applications installed on smartphones at the imaging center. Students reported interest in the X-ray imaging process that was consistent with the study by O'Shea et al. (12). 7.7% of adolescents reported interest in radiology equipment, and 28.3% of adolescents reported interest in radiography. Only four adolescents reported that they were boring in the imaging room, in contrast to a study by O'Shea et al. (12) that almost half of

the participants said they felt bored at the imaging room. 40% of adolescents felt pain in the imaging room. According to their statements, the pain that they experienced depends on their position during imaging. Conceivably, if they have more information about the X-ray imaging process, they will feel less angry and less pain. 40% of adolescents reported that the radiographer was friendly. Only 5% of students reported that the radiographer was quite rough, and 30% of adolescents said that the radiographer was impatient. According to Table.5, interactions between adolescents and radiographers were positive. 30% of adolescents left the imaging center without knowing the time to get the result. 50% of adolescents stated that the radiographer did not give them an explanation of the X-ray process. 21.6% of adolescents said that the radiographer did not give them information about the place where they received the result.

5- CONCLUSION

This study showed that adolescents do not receive optimal care during the X-ray imaging process. The study recommended additional training for radiographers about adolescents' psychology and providing age-appropriate facilities and equipment for adolescents in the radiology department. It was suggested that age-appropriate educational posters be installed on the wall, and age-appropriate television programs be displayed in the radiology departments, as well as training courses on how to interact with adolescents for radiographers.

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7- CONFLICT OF INTEREST: None.

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