PRESENCE OF PARENTS DURING PEDIATRIC IMAGING

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ABSTRACT

\textbf{Aim:} This study is conducted with the aim of assessment of the presence of parents during pediatric imaging particularly in terms of the child's anxiety and co-operation during the procedure. \textbf{Methods:} The study was carried out among the pediatric patients, parents and radiographers. \textbf{Results:} Parent and child share an unbreakable bond although in all 60 cases the radiographer was nice to the patient still 47\% patients were afraid while 53\% patients were not afraid. 60\% patients were nervous while 40\% patients were not nervous. 63\% patients were co-operative while 37\% patients were not co-operative. When asked to the parent whether their presence would have made the procedure easier All the parents think that their presence would have made their presence more easier but only in 46.70\% cases radiographers felt that the need parental presence will make the procedure easier while in 53.30\% it was not needed. \textbf{Conclusion:} The current study found that though all the radiographers were very nice to the children, the factors such as fear, nervousness and cooperation don’t play a huge factor in changing the attitude of the radiographer towards the parental presence rather it’s the need of the parental presence that radiographer feels will help in easy completion of the procedure.

I. INTRODUCTION

X-rays are electromagnetic radiation that can act as both waves and particles. They have a high level of penetration. Their wave lengths range from 0.1 to 0.5 A, with energy levels ranging from 25 to 125 keV. They are moving at the speed of light.\textsuperscript{1} Radiation ultimately affects cells through two processes. Direct effects when it interacts directly with the atoms of the DNA molecule or another biological component important to the cell's survival. Indirect effects are created by radiation interacting with water molecules.\textsuperscript{2} The biological effects of radiation are categorized into two types based on the subjects affected: Somatic effects that occur in those who are exposed. Genetic effects are biological alterations that occur in the offspring of exposed individuals as a result of genetic cell mutation.\textsuperscript{3} Excessive radiation exposure may cause harm to live tissues and organs, depending on the amount of radiation received (i.e. the dose). The risk of acquiring negative health effects is proportional to the radiation exposure. The greater the dose, the greater the chance of side effects. The risk is significantly reduced if the radiation dose is minimal or provided over a lengthy period of time since the body will heal the damage to cells and molecules.\textsuperscript{4} The science and practise of safeguarding humans and the environment against the detrimental effects of ionising radiation is known as radiation protection. Radiation protection is defined by the International Atomic Energy Agency (IAEA) as: The protection of humans against the detrimental consequences of ionising radiation exposure, as well as the techniques to achieve this.\textsuperscript{5} According to the International Commission on Radiological Protection (ICRP), the System of Radiological Protection is founded on three principles: Justification, Optimization, Dose Restrictions. There are three techniques to protect humans from identifiable external radiation sources in radiation protection: Time, Distance, and Shielding.\textsuperscript{5} Personal protective equipment (PPE) is a class of devices designed to protect the wearer against harm, infection, and other risks (such as ionizing radiation). Gloves and Eye protection, Lead aprons, Thyroid shields, Personal radiation dosimeters, Masks or face shields are the Personal protective equipment for radiologists, radiographers, other imaging department Employees and patients.\textsuperscript{6}

\textbf{What is pediatric imaging?}

Pediatric radiography is a subgroup of general radiography that specializes in radiographic imaging of children. The fundamental concepts of radiography remain constant. However, other criteria must be addressed when assessing patient-specific exposure factors, immobilization procedures, and examination appropriateness.\textsuperscript{7} Understanding that children are not just miniature people and that they must be approached on their level
are critical components for effective encounters with children in the imaging department. Working with children successfully needs an open mind, patience, creativity, a willingness to learn, and the capacity to see the world through the eyes of a child.

Another feature of pediatric imaging is children's greater sensitivity to radiation and the critical necessity to take precautions to limit the dose provided every time an x-ray treatment is performed. The notion of "imaging gently" has lately been developed in the realm of pediatric radiology to raise awareness among radiation workers and to answer parents' growing worries about radiation exposure. Images of excellent quality are required to successfully diagnose a pediatric disease. To do this, a child-friendly environment must be created. It is commonly accomplished by designating one area as a "child friendly room," in which murals or stencils can be painted on the walls. Modern pediatric hospitals are built with a lot of glass to let in as much natural light as possible. Anxiety and tension are frequently passed from parent to child—the child perceives a parent's tension through the tone of voice or actions. A well-equipped waiting area (which does not have to be pricey) can help to alleviate this stress. Toys attract and entertain children, freeing up parents' time to check in or register and inquire about crucial issues. Radiographers frequently find themselves dealing with two patients: the youngster and the parent. They may ponder to whom they should speak first. The answer, on the other hand, is simple: If the child is old enough, direct the explanation to him or her and use age-appropriate language if the child is too young to understand, direct the explanation to the parent, stating in simple phrases what will happen and what the parent is required to do. APPROACHING THE CHILD should be heavily influenced by the child's age. An x-ray" can be a terrifying event for a young child. Unfamiliar people and odd machinery might be frightening. Not long ago, most children's hospitals imposed stringent limitations on parental access to the hospital. There was widespread concern that open visiting hours might interfere with patient care. The exact opposite has shown to be true. Unrestricted parental visiting has proven to be a significant advantage in patient treatment, resulting in greater collaboration and approval from patient families as well as happier children. The benefits of parental involvement can be enormous for everyone involved, including patients, parents, radiographers, and departmental administrators. According to past experience, the basic method should be described to both parents. However, only one parent should be present in the imaging room. The presence of both parents frequently crowds the room, which is distracting and can actually lengthen the process. The presence of the parent assures that the child or teenager does not misinterpret any action, explanation, or query. At the same time, the parent may rest assured that the child is being looked for professionally. When parents are present in a radiography exposure room, they should be shielded from scatter radiation. If their hands will be in close proximity to the primary radiation beam, parents should be provided with lead gloves.

PEDIATRIC IMMOBILIZATION methods are used to keep children immobile during medical imaging examinations. Because radiation dosage can impact children up to ten times more than adults.

II. METHODOLOGY

STUDY DESIGN
It's a retrospective sectional type of study.

STUDY PLACE
The proposed study will be obtained from the radiology department at MAHARISHI MARKANDESHWAR INSTITUTE OF MEDICAL SCIENCE AND RESEARCH.

METHOD OF DATA COLLECTION
The study was carried out among the pediatric patients, parents and radiographers. The aim of the research was explained to everyone. The questionnaire was structured by using Google form and was filled during the procedure. The questionnaire was divided into three sections. Section A included personal information of the patient, in section B there were questions asked to the parent and radiographer and in section C the answers were based on observations on pediatric patients.

TYPE OF STUDY
Both open and close ended questionnaire were given to the participants.

SOURCE OF DATA
The set of data will be obtained from the radiology department at MAHARISHI MARKANDESHWAR INSTITUTE OF MEDICAL SCIENCE AND RESEARCH.
INSTITUTE OF MEDICAL SCIENCE AND RESEARCH.

DURATION OF STUDY
Study was conducted from November 2022 to May 2023.

SAMPLE SIZE
A population study will be conducted on 60 patients

INCLUSION CRITERIA
In this study all interested, required and available patients and radiographers of the radiological department were included in the study

EXCLUSION CRITERIA
In this study those patients were excluded who didn't want to take part in the study.

TECHNIQUE OF STUDY
In this study all the patients, parents and radiographers who were interested in the study filled the questionnaire and collected data was taken for analysis.

III. MATERIAL
Data was collected using hard copies of Google forms which were distributed to patients, parents and radiographers.
Data was analyzed using descriptive statistical tools, frequency mean and percentage.
Data collection chart table include patients name, age and sex.
Data collection was done in the form of questionnaire containing objective and checkbox-based questions using Google forms.

QUESTIONIARE

SECTION A – DEMOGRAPHIC DATA:
1. Age
2. Gender

SECTION B - Questions asked to parents and radiographers:
3. Do you think your ward can confidently go inside the X-Ray room alone?
   YES   NO
4. Was your child afraid to go inside the X-Ray room?
   YES   NO
5. Do you know anything about X-Rays?
   YES   NO
6. Do you know how harmful X-Rays are for your child and you?
   YES   NO
7. Did Radiographer provide you with the X-Ray protection equipment's during the procedure?
   YES   NO
8. Does your child go to school?
   YES   NO
9. Are you willing to go inside the X-Ray room with your child?
   YES   NO
10. Would your presence had made the procedure easier?
    YES   NO
11. Is your child?
    INTROVERT   EXTROVERT
12. How was the radiographer's behavior while dealing with your patient?
13. As a radiographer did you feel that the presence of parent made the procedure easier?
YES    NO
14. Did you allow the parents to be present inside the X-Ray room?
YES    NO

**SECTION C - OBSERVATION BASED QUESTIONS:**

15. Was patient afraid?
YES    NO
16. Was patient nervous?
YES    NO
17. Was patient Co-operative?
YES    NO
18. Did parental presence make any good impact on the procedure?
YES    NO
19. Was Radiographer nice to the patient?
YES    NO
20. Did Radiographer allow the parent inside?
YES    NO

**IV. RESULTS AND DISCUSSION**

The results of the PRESENCE OF PARENTS DURING PEDIATRIC PATIENTS conducted is presented here in the following section

<table>
<thead>
<tr>
<th>Age group</th>
<th>No of patients</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>0-2</td>
<td>02</td>
<td>3.3%</td>
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<tr>
<td>3-5</td>
<td>19</td>
<td>31.67%</td>
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<tr>
<td>6-8</td>
<td>16</td>
<td>26.67%</td>
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<tr>
<td>9-12</td>
<td>23</td>
<td>38.3%</td>
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<tr>
<td>TOTAL</td>
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<td>100%</td>
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</table>

<table>
<thead>
<tr>
<th>GENDER</th>
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<th>PERCENTAGE</th>
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<tbody>
<tr>
<td>Female</td>
<td>19</td>
<td>31.67%</td>
</tr>
<tr>
<td>Male</td>
<td>41</td>
<td>68.33%</td>
</tr>
<tr>
<td>TOTAL</td>
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Parental presence made procedure easier

<table>
<thead>
<tr>
<th></th>
<th>No of patients</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>YES</td>
<td>28</td>
<td>46.70%</td>
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<tr>
<td>NO</td>
<td>32</td>
<td>53.30%</td>
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<tr>
<td>TOTAL NO OF PATIENTS</td>
<td>60</td>
<td>100%</td>
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Was Radiographer nice

<table>
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<tr>
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<td>NO</td>
<td>0</td>
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<tr>
<td>TOTAL</td>
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Parent allowed

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Good impact of parental presence

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<td>TOTAL</td>
<td>60</td>
<td>100%</td>
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Total no of participants in this study were 60, the analysis of their demographic profile include age group and age ratio. The age group was divided into a total number of 4 groups. First group was of 0-2 year’s old patients had 2 patients, second group was of 3-5 years old patients consisting of 19 patients, third group was between 6-8 years old patients with 16 number of patients, fourth group was of 9-12 years old with 23 patients. As the study included pediatric patients, the age group with the greatest number of patients was 9-12 years followed by 3-5 years and 6-8 years with 38.30%, 31.70% and 26.70% respectively and the group with least number of patients was 0-2 years with 3.30%. The total number of patients who took part in the study or were included in the study was 60. The sex ratio is divided into 2 groups. First group is female and second group is male. The sex ratio of both male and female patients has a variation. The total numbers of female patients are 19 and the total numbers of male patients are 41. The percentage of female patients is lower, with 31.67%, than male patients with 68.33%.

A question was asked to the parent whether his ward can go alone inside the x-ray room Out of 60 patients, 33 were able to go alone inside the x-ray room while 27 patients were not able to go alone inside the x-ray room. 55% patients were able to go alone while 45% patients were not able to go inside.

When asked whether the child was afraid to go inside the x-ray room or not Out of 60 patients, 28 were afraid to go while 32 were not. 46.67% patients were afraid to go inside the x-ray room while 53.33% patients were not afraid to inside the x-ray room. Parents were also asked whether they know about x-rays or not the 45 parents who participated in the study responded yes to the question and 15 answered no. 45 responded Yes that means the percentage of parents who checked against yes is 75%. And 15 parents gave the response as no and thus its percent is 25%. But when they were asked whether about the nature of x-rays. Out of 60 patients only 17 parents knew about how harmful x-rays are while 43 lacked the knowledge. 28.30% parents had knowledge about x-rays while 71.70% parents don’t have any knowledge. The question was asked whether they or their child were given equipment’s during procedure they all responded with yes. When asked if their child go to the school or not Out of 60 patients, 49 patients go to school while only 11 patients didn’t go to school. The percentage of patients going to school was 81.70% while 18.30% patients didn’t go to school. The question was asked to the parent whether they were willing to go inside the x-ray room all the parents were willing to go inside the x-ray room. The question was asked to the parent whether their presence would had made the procedure easier. All the parents think that their presence would had made their presence more easier. When asked if their child was extrovert or introvert Out of 60 patients, 27 patients were extrovert while 33 patients were introvert. 55% patients were introvert while 45% patients were extrovert. The question was asked to the parent about the behaviour of the radiographer The response of the parents and their parents showed that out of 60 patients, 16 patients found the behavior of the radiographer very good, 43 patients responded with good behavior, 1 patient found the radiographers behavior average and no bad behavior of the
radiographer was recorded. 26.70% patients found the radiographers behavior very good, 71.70% patients found the radiographers behavior good, 1.60% patients found the radiographer's behaviour average while no patient experienced any bad behavior of the radiographer. The question was asked to the radiographer whether parental presence made procedure easier, out of 60 patients in 28 cases the radiographers felt that the parental presence made the procedure easier while in 32 cases the radiographers felt that parental presence was not needed. In 46.70% cases radiographers felt that parental presence made the procedure easier while in 53.30% it was not needed. The question was asked to the radiographer if they allowed the parent inside. Out of 60 cases in 28 cases the parent were allowed in the x-ray room while in 32 cases patients were not allowed. 47% cases parents were allowed while in 53% cases parents were not allowed.

The results of the questions based on observation were as follows:

Out of 60 patients, 28 patients were afraid while 32 patients were not afraid. 47% patients were afraid while 53% patients were not afraid.

Out of 60 patients, 36 patients were nervous while 24 patients were not nervous. 60% patients were nervous while 40% patients were not nervous.

Out of 60 patients, 38 patients were co-operative while 22 patients were not co-operative. 63% patients were co-operative while 37% patients were not co-operative.

Out of 60 patients, in 28 patients parental presence had good impact while in 32 patients it was not needed. In 46.70% cases it had good impact while in 53.30% it was not required. In all the 60 cases the radiographer was nice to the patient.

Out of 60 cases in 28 cases parent was allowed while in 32 cases parent was not allowed. In 46.70% cases parents were allowed while in 53.30% cases parent were not allowed.

V. CONCLUSION

The conclusion of PRESENCE OF PARENTS DURING PEDIATRIC PATIENTS is presented here in the following segments.

The study was carried out among (n=60) patients those who came in the radiology department in M.M.I.M.S.R Mullana, Ambala Haryana. The conclusion of this thesis was that parental presence was only allowed when the radiographer needed any help and felt that their presence would have any good impact on the procedure.

Responses from the parents concluded that the majority i.e. 33 out of 60 (55%) patients were able to go alone inside the x-ray room, this is because the patient was able to go alone inside the x-ray room for procedure as they were very confident and the minority i.e. 27 out of 60 (45%) were not able to go alone, this is because the patient was not able to go alone as they were having fear of going alone inside the x-ray room.

It was concluded that out of 60 patients, 28 (46.67%) were afraid to go inside the x-ray room, this is because they may be the patients came in x-ray department for the very first time, while 32 (53.33%) patients were not afraid to inside the x-ray room, this is because they may have visited the x-ray department before.

It was concluded that 75% of parents know about the x-rays while 25% parents had no knowledge about x-rays. The majorities of parents had good knowledge about x-rays as they were well educated and were socially aware while some parents may be educated but were unaware about the knowledge regarding x-rays, but when they were asked about the nature of x-rays. Out of 60 patients only 17 parents knew about how harmful x-rays are while 43 lacked the knowledge. 28.30% parents had knowledge about nature of x-rays while 71.70% parents don't have any knowledge. It was concluded that all parents or patients (when required) were given equipment's during procedure as radiographers were aware about radiation protection and harmful effects of ionizing radiation.

Responses from the parents concluded that the majority i.e. 49 out of 60 (81.70%) children goto school, as they were above 3 years and the minority i.e. 11 out of 60 (18.30%) didn't go to school, as they were below 3 years. It was concluded that all the parents were willing to go inside the x-ray room as they wanted to be present during the procedure of their child. This is because they were very protective and nervous for their child. Further when asked if their presence would had made the procedure easier. All the parents think that their presence would had made their presence more easier as they felt that their...
child would be more comfortable and co-operative in their presence.

Response from the parents concluded that out of 60 patients, 27 (55%) patients were extrovert while 33 (45%) patients were introvert. The nature of the child mainly depends upon familiar and unfamiliar people they meet during procedure.

It was concluded that out of 60 patients, 16 (26.70%) patients found the behavior of the radiographer very good, 43 (71.70%) patients responded with good behavior, 1 (1.60%) patient found the radiographers behavior average and no bad behavior of the radiographer was recorded.

The question was asked to the radiographer whether parental presence made procedure easier the radiographers were asked whether the parental presence would had made the procedure easier, out of 60 patients in 28 (46.70%) cases the radiographers felt that the parental presence made the procedure easier while in 32 (53.30%) cases the radiographers didn’t felt any need of the parental presence as child were very co-operative and were not afraid to be alone with radiographer. Further when radiographers were asked if they allowed the parent inside Out of 60 cases in 28(47%) cases the parent were allowed in the x-ray room while in 32 (53%) cases patients were not allowed .When observed the patient, parent and the radiographers, we found that Out of 60 patients, 28(47%) patients were afraid while 32 (53%) patients were not afraid. 36 (60%) patients were nervous while 24 (40%) patients were not nervous. 38 (63%) patients were co-operative while 22 (37%) patients were not co-operative. In 28 (46.70%) patients parental presence had good impact while in 32 (53.30%) patients it was not needed. In all the 60 cases the radiographer was nice to the patient. In 28 (46.70%) cases parents were allowed while in 32 (53.30%) cases parents were not allowed.

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