Healthcare encounters in young children: Impact of Teddy Bear Hospital, Singapore

Ong Lynn¹, Chua Khoon Han¹, Soh Jian Yi² & Aw Marion Margaret Hui Yong²

¹Yong Loo Lin School of Medicine, National University of Singapore; ²Department of Paediatrics, Khoo Teck Puat-National University Children’s Medical Institute, National University Health System

Abstract

Background: Teddy Bear Hospital (TBH) was initiated to address children’s fear through role-play. We aim to assess effectiveness of Singapore TBH sessions in decreasing childhood anxiety and enhancing their healthcare knowledge.

Methodology: We performed a cross sectional descriptive study of children (5-8 years) participating in TBH between March and May 2016. Each child completed two multiple-choice questionnaires with pictorial aids. The first survey assessed baseline knowledge and feelings towards healthcare, whilst the second survey assessed the same knowledge and how feelings towards healthcare may have changed after attending TBH.

Results: Data from 334 completed surveys were collected. We excluded 82 children with incomplete data, leaving data from 252 children for analysis; 96 pre-school (38.1%) and 156 primary school (61.9%).

Most children did not have negative feelings towards visiting the doctor or hospital before TBH. Children with positive feelings towards visiting the doctor and hospital increased from 82.5% to 94.4% (p-value <0.001) and 70.2% to 73.4% (p-value 0.035) respectively.

After TBH, majority of children (57.9%) improved scores in knowledge-related questions. Children who answered all knowledge-related questions correctly increased from 81 (32.1%) to 185 (73.4%) (p-value = 0.001) and 70.2% to 73.4% (p-value 0.035) respectively.

After TBH, majority of children (57.9%) improved scores in knowledge-related questions. Children who answered all knowledge-related questions correctly increased from 81 (32.1%) to 185 (73.4%) (p-value = 0.001) and 70.2% to 73.4% (p-value 0.035) respectively.

Conclusion: We found that most Singaporean children were positive towards healthcare encounters. A TBH experience was able to further increase this number, as well as increase their healthcare knowledge.

Keywords: Teddy Bear Hospital, Singapore, Hospital Role-play, Childhood Anxiety, Educational Tool

Practice Highlights

- Young children (aged 5 to 8 years) in Singapore have positive feelings towards healthcare encounters.
- TBH is an effective tool in reducing childhood anxiety towards healthcare encounters.
- TBH is an effective educational tool for children to acquire healthcare knowledge.

I. INTRODUCTION

 Childhood play is important in normal psychological and socio-emotional skills development (Lewis, 1993; A., Chinekesh, Kamalian, Eltemasi, S., Chinekesh, & Alavi, 2013). Situational play gives children an opportunity for emotional insight and expression of their inner-feelings (Moustakas, 1951), allowing children to develop adaptive coping skills in social environments (Stone & Stark, 2013).

 Play therapy is increasingly becoming the platform for assessment and intervention in childhood (Jäger, 2013; Reddy & Hirisave, 2014). In particular, care in hospitalised children also extends to therapeutic play to decrease negative emotions related to hospitalisation (Koukourikos, Tzeh, Pantelidou & Tsaloglidou, 2015). For example, a study of 60 children, aged 3-8 years, who underwent play therapy involving toys were found to
have decreased anxiety before their surgery (Ghabeli, Moheb & Nasab, 2014).

Teddy Bear Hospital (TBH) is a project initiated to address children’s fear through hospital role-play, as well as provide medical students with the platform to interact with children in a pseudo-medical context (Kaufman, Modak & Moylan, 2012). Started off as a community project aimed to enhance education of unexpected admissions to reduce fears about hospitals in America (Santen & Feldman, 1994), case-control studies done in different countries such as Israel (Bloch & Toker, 2008), Australia (Kaufman et al., 2012) and Germany (Leonhardt, Margraf-Stiksrud, Badners, Szerencsi & Maier, 2014), has also shown that TBH is effective in reducing children’s anxiety (Chinekesh et al., 2013) about hospitalisation in a simulated environment and enhance their knowledge concerning body, health and disease (Leonhardt et al., 2014).

In Singapore, there are psychological paediatric services such as the Child Life Service of National University Hospital, Singapore which uses therapeutically medical play to prepare children for procedures or surgeries and help them better understand the hospital environment and their medical conditions. However, these services are mostly limited to children with medical conditions seeking healthcare in tertiary institutions such as hospitals. The majority of the population seek healthcare in primary institutions such as polyclinics and private medical practitioners, which the children would be more familiar with.

Since 2013, Singapore medical students have been involved in running TBH sessions for pre-school and primary school children outside of the hospital environment. Medical students will visit different schools which have expressed interest in the TBH session programme. Four concurrent stations will represent different clinical areas in the simulated hospital environment: namely, the family physician clinic, the asthma clinic, the orthopaedics clinic and the operating theatre. Children will learn about various specialties depicted in each station through role-play as young doctors taking care of their teddy bears or stuffed toys. The final station simulated an emergency situation, where the children were taught the important information to convey while calling for an ambulance. Descriptions of each stations are further elaborated in Appendix. The programme is fully run by the medical student volunteers. Parents were not present during the TBH sessions, while school teachers were silent observers.

Although the TBH programme has been ongoing for several years with the aim of reducing childhood anxiety of healthcare environment through role-play, there has been limited international research that have shown results that can supported this aim. Hence, this study aims to assess the effectiveness of TBH in reducing children’s fear of hospital and doctors and its effectiveness in enhancing children’s knowledge of healthcare locally.

II. METHODS

A. Study Design and Data Collection

We performed a cross sectional descriptive study of children taking part in TBH sessions between 28 March and 20 May 2016. All children aged 5 to 8 years old were recruited from kindergartens and primary schools which TBH sessions were organized. Prior to the TBH sessions and before administering the surveys, descriptions of the TBH session and study were provided to the parents of these children through the schools, and written parental consent was obtained. Exclusion criteria was children without parental consent.

Each child completed two questionnaires containing multiple-choice questions with pictorial aids. The first survey was administered right before the TBH session to assess baseline knowledge and feelings towards healthcare. The second survey was administered immediately after the TBH session to assess knowledge acquired and how their feelings towards healthcare may have changed. All pre- and post-session surveys were matched according to coded-numbers with no child identifiers collected.

We excluded children who had incomplete data, such as missing answers to any of the multiple choice question in the survey. Children who completed the multiple choice component but did not answer the open-ended questions were still included.

B. Definitions of Survey Questions

Questionnaires were modified from previous studies on TBH (Bloch & Toker, 2008; Leonhardt et al., 2014) and developed based on the various stations of the TBH session.

Childhood anxiety towards healthcare services was assessed by questions asking children how they feel when they visit the doctor or hospital from scaled options provided. The options “very happy”, “happy” and “normal” were collapsed into one group defined as “positive feelings”, while “scared” and “very scared” were collapsed into another group defined as “negative feelings”. Willingness of health-seeking behaviour was assessed by children answering “yes” or “no” to the question “When I am sick, I want to see the doctor”.
Impact of TBH in enhancing children’s medical knowledge was assessed using three questions regarding part of the entire content taught during the TBH session. There were four options per question, including the option “don’t know”, which was classified as an “incorrect” answer. Improvement in score after TBH session was defined as “positive impact”, while decrease or no change in score was defined as “no impact”.

We also stratified the responses of participants according to their education level: “preschool” and “primary school”. This was to analyse the potential effect of education level on the attitudes and knowledge of healthcare for children.

C. Statistical Analysis
Data analysis was completed using the Statistical Package for Social Sciences software (version: IBM SPPS Statistics 22.0). Statistical analyses of differences between children’s responses before and after attending TBH were performed using the Chi-squared test for categorical variables. Logistic regression tests were performed to assess associations between education level, baseline feelings towards healthcare and baseline knowledge.

III. RESULTS
A. Study Population and Demographics
There were 411 children who participated in TBH between March and May 2016. Parents of 77 children did not consent for their child to participate in the study. Data from completed surveys of 334 children were collected as described above. We excluded 82 children with incomplete data. In total, data from 252 children were analysed. The children were grouped by their education level, with 96 from pre-school (38.1%) and 156 from primary school (61.9%). The age of the children ranged from 5 to 8 years, with the mean age being 6.37 years. Other demographic data such as gender, past illness and previous medical encounters were not collected for this study.

B. Children’s Feelings towards Healthcare
Before attending TBH, 82.5% and 70.2% children were not afraid to visit the doctor or hospital respectively TBH (Table 1). In addition, 88.5% children indicated they would want to see the doctor when they are sick. There was a significant association between being not afraid and being willing to see a doctor or visit a hospital when sick OR = 5.03 (CI 2.21 – 11.5, p-value <0.01) and OR = 2.91 (CI 1.33 – 6.39, p-value <0.008) respectively. Children who were willing to visit a doctor were also more likely be willing to visit the hospital (OR = 2.93 [1.50 – 5.71], p-value 0.002).

Education level (pre-school vs primary school) was not significantly associated with any feelings towards healthcare, in terms of wanting to see the doctor (p-value 0.67), being fearful of visiting the doctor (p-value 0.15) or hospital (p-value 0.90).

Children’s feeling of happiness towards visiting the doctor increased from 82.5% to 94.4% (p-value <0.001) when measured on a 5-point scale (1: very happy, 2: happy, 3: normal, 4: scared and 5: very scared), with the median changing from 2 to 1. Children who felt happy to visit the hospital increased from 70.2% to 73.4% (p-value 0.035) when measured on the same 5-point scale (Table 1).

<table>
<thead>
<tr>
<th>Feelings when visiting</th>
<th>Doctor Before TBH</th>
<th>After TBH</th>
<th>Hospital Before TBH</th>
<th>After TBH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Afraid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Happy</td>
<td>64 (25.4%)</td>
<td>63 (25.0%)</td>
<td>46 (18.3%)</td>
<td>54 (21.4%)</td>
</tr>
<tr>
<td>Normal</td>
<td>73 (28.9%)</td>
<td>47 (18.7%)</td>
<td>85 (33.7%)</td>
<td>76 (30.2%)</td>
</tr>
<tr>
<td>Total Number of Children Who Were Not Afraid</td>
<td>208 (82.5%)</td>
<td>238 (94.4%)</td>
<td>177 (70.2%)</td>
<td>185 (73.4%)</td>
</tr>
<tr>
<td>Afraid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scared</td>
<td>27 (10.7%)</td>
<td>8 (3.2%)</td>
<td>32 (12.7%)</td>
<td>29 (11.5%)</td>
</tr>
<tr>
<td>Very Scared</td>
<td>17 (6.7%)</td>
<td>6 (2.4%)</td>
<td>43 (17.1%)</td>
<td>38 (15.1%)</td>
</tr>
<tr>
<td>Total Number of Children Who Were Afraid</td>
<td>44 (17.5%)</td>
<td>14 (5.6%)</td>
<td>75 (29.8%)</td>
<td>67 (26.6%)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.001</td>
<td>0.035</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Children’s feelings towards visiting the doctor and the hospital on a 5-point scale before and after attending TBH (N = 252)
C. Children’s Healthcare Knowledge

The children’s healthcare knowledge was assessed by three questions (Figure 1). Prior to attending TBH, two-thirds of the children knew that X-rays are taken when an individual falls (65.9%) and the number to call for an ambulance (67.1%), while half of them knew the inhaler puff is used as the treatment for asthma (55.2%).

The number of children who answered each question correctly after attending TBH increased for all three questions (Figure 1). Children who answered all three knowledge-related questions correctly increased from 81 (32.1%) before attending TBH to 185 (73.4%) after attending TBH, with the median value improving from 2 to 3 (p-value <0.001). Overall, healthcare knowledge scores increased in 146 children (57.9%) after attending TBH.

D. Factors associated with Children’s Healthcare Knowledge scores

School age of child (p-value <0.001) and wanting to visit the doctor when one is sick (p-value 0.024) were significantly associated with better healthcare knowledge before attending TBH. Children in primary school were three times more likely to obtain full marks in healthcare knowledge questions compared to those in kindergarten (OR 3.08, 95% CI 1.66 – 5.70). Children who wanted to visit the doctor when they were sick were three more times likely to obtain full marks in healthcare knowledge questions as compared to those who did not want to visit doctor (OR 3.38, 95% CI 1.08 – 10.6). These two variables were no longer found to be associated with better healthcare knowledge scores after attending TBH.

E. Children’s Thoughts on Teddy Bear Hospital

Of 252 children, 246 (97.6%) responded “yes” to the statement “I like Teddy Bear Hospital”. Reasons quoted in the free response answers included comments relating to a positive experience (these included “fun”, “nice”, “interesting” or “enjoyable”) (52.8%), knowledge acquisition (“able to learn something new”) (10.3%) and the use of teddy bears or toys during the session (8.3%).

IV. DISCUSSION

To our knowledge, this is the first local study in Singapore that evaluates the impact of TBH on children participants. We observed that majority of children had increased healthcare knowledge after attending TBH. We also noted that majority of children felt happy to visit the doctor or the hospital before attending TBH. Despite being relatively high, this number increased further after the TBH session. Our findings were consistent with an Israeli case-control study that recruited 41 preschool children aged 3 to 6.5 years, and 50 age-matched children as controls, which reported that children in the TBH group have significantly lower levels of anxiety than the control group at follow-up (Bloch & Toker, 2008).

From the study results, it appears that while most of the children in Singapore felt happy instead of anxious while visiting the doctor or hospital, TBH is effective locally in further helping to reduce the level of anxiety for children who had taken part in a session. In Singapore, TBH is also effective in enhancing healthcare knowledge of children who took part in a session. These findings are in keeping with the original hypothesis that TBH is effective in both enhancing children knowledge of healthcare and reducing childhood anxiety of doctors and
hospitals in Singapore. From this study, we can gather that simulation and role playing as done with TBH in Singapore could potentially be an effective educational tool for teaching children.

There are several limitations to our study. There is the potential for selection bias as we recruited only those children with parental consent. Hence an assumption would be that children whose parents consented to participate would be representative of the whole cohort. Another potential limitation is reporting error. Some of the younger children (mainly pre-schoolers, aged between 5 to 6 years) may have difficulty understanding the questions. We attempted to overcome this by providing pictorial aids which would help these younger children better understand the questions. While there are studies looking at the effect of play therapy (Ghabeli et al., 2014), there is limited long-term data available that looks at the impact of TBH programme, which limits research which the current study can reference too.

A vital aim of TBH in Singapore was to simulate the hospital environment with teddy bears to explore ways to cope with children fears of doctors and hospitals in a controlled setting, which our study has suggested the potential to do so. Role playing with Teddy Bears also can assist us in educating children with the necessary healthcare knowledge to understand common scenarios they might encounter when they visit the doctor hospitals in future. However, while there has been increased interest from schools, organisations and even individuals to take part in TBH programme, the outreach of this community project has been limited by the manpower available as all of the medical students organizing the programme are volunteers.

In the future, more extensive research could be targeted at exploring the exact phobias of children in these situations so that the TBH program locally can be further modified to target these areas to reduce fear and anxiety of children more effectively. It would also be interesting to explore the long-term impact of the TBH programme, to find out whether children who has taken part in TBH really do experience reduced anxiety during their next hospital visit as compared to those who did not participate, which unfortunately we did not have the opportunity to explore in this study. Another potential extension of the current study is to assess the impact that the TBH programme has on children with medical conditions as compared to healthy children, as the former group may have been exposed to prior hospitalization or healthcare situations which were fearful and initially unfamiliar.

V. CONCLUSION
In conclusion, TBH is an effective educational tool for children to acquire healthcare knowledge as well as reduce their anxiety associated with healthcare encounters. Children in Singapore are in general positive and not fearful of healthcare encounters.

Notes on contributors
Ong Lynn graduated from Yong Loo Lin School of Medicine, National University of Singapore. She was involved in the study design, data collection, analysis and formal report writing in this research as a final year undergraduate student.

Chua Khoon Han graduated from Yong Loo Lin School of Medicine, National University of Singapore. He was involved in the study design, data collection and formal report writing in this research as a final year undergraduate student.

Soh Jian Yi is a Consultant at the University Children’s Medical Institute, National University Health System. His research interests lies in the fields of allergy and immunology, particularly focusing on food allergy and desensitisation. He also contributes articles regularly to the Straits Times: Mind Your Body on child health.

Marion M. Aw is an Associate Professor with Department of Paediatrics, National University of Singapore and a Senior Consultant at the University Children’s Medical Institute, National University Health System. She has a keen interest in medical education, and is involved in both Paediatric Undergraduate and Postgraduate training.

Ethical Approval
Ethics approval for the study (NUS-2731) was obtained from the Institutional Review Board of National University of Singapore.

Acknowledgement
The research team extends our greatest gratitude to the following groups of people:

- The 2016 Teddy Bear Hospital Executive Committee for organised Teddy Bear Hospital sessions during March to May 2016 and conducted data collection for the study;
- Medical students from Yong Loo Lin School of Medicine, National University of Singapore and Lee Kong Chian School of Medicine, Nanyang Technological University who volunteered to guide children participants in the role-play during Teddy Bear Hospital sessions; and
• Department of Paediatrics, National University Hospital for contributing financial support for the purchase of equipment required to organise Teddy Bear Hospital sessions.

Declaration of interest
Marion M. Aw is the clinical mentor for the medical students in charge of the Teddy Bear Hospital, Singapore. Ong Lynn and Chua Khoon Han were both involved in TBH as part of the organising committee during the course of this study.

The remaining author do not have financial, consultant, institutional and other relationships to Teddy Bear Hospital, Singapore that might lead to bias or a conflict of interest.

References


*Ong Lynn
Email: ong.lynn@u.nus.edu
Mobile: +65 8339 8617
APPENDIX

Activities of Teddy Bear Hospital
Teddy Bear Hospital is a simulated environment of a patient’s visit to hospital. At each kindergarten or within each class at the primary school, the children were divided into 4 groups to participate in 4 concurrent stations in turns, before coming together for the final station. There are 4 stations depicting various clinical areas in a hospital, namely the Family Medicine Clinic, the Asthma clinic, the Orthopaedics Clinic and the Operation Theatre. Participants will learn about the various specialties depicted in each station through role-play as young doctors taking care of their teddy bears or stuffed toys. Each station will last 6 to 8 minutes. The entire Teddy Bear Hospital session (rotation through all 5 stations) takes approximately 45 minutes to 1 hour.

The Family Physician Clinic
This station simulates a visit to the Family Medicine / General Practitioner Clinic. The station begins with teaching participants the correct 7-step technique of hand-washing with alcohol hand rub. Children will play the role of young doctors examining their stuffed toys with various medical instruments, namely the pen-torch, the tongue depressor, the thermometer, the tendon tapper, the tuning fork and the stethoscope.

The Asthma Clinic
This station simulates a visit to the Asthma Clinic. Children will learn about asthma and the equipment used in the management of an asthma attack. They learn to use the inhaler puff, the spacer and the nebulizer by simulating giving medications to their teddy bears and stuffed toys. They will also be introduced to the idea of an injection (when all above medications fail), which is represented by a syringe.

The Orthopaedics Clinic
This is a station explaining the care of a patient with a bone fracture. Children will learn about the various bones in the human body using a skeleton model (introduced as “Mr. Bones”). Children will also have the opportunity to identifying images of bones on X-ray films. They will then use crepe bandages to simulate bandaging their teddy bears and soft toys.

The Operation Theatre
This is a station simulating an appendectomy surgery in the operation theatre. Children will role-play assistants aiding “Teddy Doctors” (medical students) during the “surgery”. Children will put on a surgical mask and a surgical cap, and introduced to various internal organs, such as the heart, stomach, intestines, liver and appendix, which are represented by hand-sewn bags filled with cotton wool.

The Emergency Situation: “Save Teddy”
“Save Teddy” is a mass participation station featuring a life-sized Teddy mascot. Children will learn the important information to provide when calling for an ambulance in an emergency, enacted by the fainting of the Teddy mascot.