The effectiveness of therapeutic play, using virtual reality computer games, in promoting the psychological well-being of children hospitalised with cancer

William HC Li, Joyce OK Chung and Eva KY Ho

Aims. To examine the effectiveness of therapeutic play, using virtual reality computer games, in minimising anxiety and reducing depressive symptoms in Hong Kong Chinese children hospitalised with cancer.

Background. There has been an increase in the use of therapeutic play intervention to help children cope with the stress of hospitalisation. However, it is not clear whether therapeutic play is an appropriate psychological intervention for Chinese children hospitalised with cancer.

Design. A non-equivalent control group pretest–post-test, between-subject design was employed.

Method. Hong Kong Chinese Children (8–16 years of age), admitted to a paediatric oncology ward for the treatment of cancer during a 14-month period, were invited to participate in the study. Of the 122 children, 70 formed the control group receiving routine nursing care and 52 in the experimental group receiving therapeutic play interventions.

Results. The results showed that children in the experimental group reported statistically significant fewer depressive symptoms than children in the control group on day 7. The results, however, find no differences in children’s anxiety scores between the two groups on day 7.

Conclusion. The study provides empirical evidence to support the effectiveness of therapeutic play, using virtual reality computer games, in the psychological preparation of children hospitalised with cancer, thus charting a path towards promoting holistic and quality care.

Relevance to clinical practice. The findings heighten the awareness in healthcare professionals that play is a very important part of children’s life and that they need play even when they are ill.

Key words: cancer, children, nurses, nursing, psychological, therapeutic play, virtual reality

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Introduction

The diagnosis and treatment of cancer is a stressful and threatening experience for children (Hicks & Lavender 2001, Penkman et al. 2006). Although survival rates for childhood cancer are higher than ever before, the course of treatment for cancer, such as chemotherapy, surgery or radiotherapy, is still a very stressful experience in the life of a child (Stam et al. 2006, Williams et al. 2006). However, children with cancer may not only be at risk from adverse medical effects, their psychosocial well-being may also be severely affected as a result of the cancer and its therapy (Langeveld et al. 2004).

Over the past few decades, numerous research studies in children’s health care have focused on different methods of psychologically preparing children hospitalised for cancer treatment (Hicks & Lavender 2001, Dowling et al. 2003,
Penkman et al. 2006). Among all nursing preparations, the provision of information for parents or caregivers of children with cancer on physiological care in cancer treatment is the most common nursing practice in paediatric oncology units in Hong Kong. However, in a recent study examining the impact of cancer on Hong Kong Chinese children’s physical, emotional and psychosocial well-being, the results indicated that children reported relatively high state anxiety scores on admission for cancer treatment and more than half of the participants were potentially at risk of depression, or at least presented some depressive symptoms during their stay in hospital (Li et al. 2010). Moreover, semi-structured interviews revealed that nearly all children hospitalised with cancer expressed different degrees of sadness and worry. The findings from this study suggested that there is a room for improvement in existing nursing intervention regarding preparing children for the treatment of cancer and hospitalisation.

During the past decade, there has been an increase in the use of therapeutic play intervention to help children cope with the stress of hospitalisation. Therapeutic play is a set of structured activities designed according to psychosocial and cognitive development of children and health-related issues to prepare children psychologically for hospitalisation (LeVieux-Anglin & Sawyer 1993). The central goal of therapeutic play is to facilitate the emotional and physical well-being of hospitalised children (Vessey & Mahon 1990). Armstrong (2000) claimed that play may not only allow children to gain pleasure, but also may help them act out stressful or threatening experiences when faced with stressful medical procedures and unfamiliar environments. Numerous studies have described the benefits of therapeutic play in helping children cope with the stress caused by illness and hospitalisation (Armstrong 2000, O’Connor & Drennan 2003, Li et al. 2007). In a randomised controlled trial to examine the effectiveness of therapeutic play intervention on outcomes of children undergoing day surgery, the results showed that children reported lower state anxiety scores and exhibited fewer instances of negative emotional behaviours in pre- and postoperative periods (Li & Chung 2009). Regrettfully, the majority of previous research on therapeutic play was case studies, which are based on theories and clinical observations. There is a lack of empirical evidence to determine accurately the clinical effectiveness of therapeutic play, in particular using it to ease the psychological burden of children hospitalised with cancer. A review of the literature reveals that there is so far no published study testing the effects of therapeutic play intervention on minimising psychological distress for children hospitalised with cancer in Hong Kong Chinese context. As play has traditionally been viewed as less important for hospitalised children by many Chinese parents and some healthcare staff compared with physiological care or medical treatment in Hong Kong (Becher & Sing 1997), it is not clear whether therapeutic play is an appropriate psychological intervention for Chinese children and their parents. Given these issues, the purpose of this study was to examine the effectiveness of therapeutic play, using virtual reality computer games, in minimising anxiety and reducing depressive symptoms in Hong Kong Chinese children with cancer.

Methods

Design and sample

The study was carried out in one of the largest acute-care hospitals in Hong Kong with a well-established paediatric oncology unit. To examine the effects of therapeutic play intervention, a non-equivalent control group pretest–posttest, between-subject design was employed.

The study was divided into two phases. In Phase one, all participants admitted to the oncology unit received usual care (control group). After finishing data collection for the control group, we allowed one-month washout period before starting data collection in Phase two. All participants admitted to the oncology unit in Phase two received usual care plus therapeutic play using virtual reality computer games (experimental group).

Children with cancer admitted to the oncology ward of an acute hospital for the treatment of cancer, meeting the inclusion criteria for the study, were invited to participate in the research. The inclusion criteria were as follows: (1) children should be between 8–16 years of age; (2) children are able to speak Cantonese and read Chinese; and (3) children should have been diagnosed with cancer for at least two months and be currently undergoing active treatment. The researcher excluded children who with identified cognitive and learning problems in their medical records. Indeed younger children may also benefit from therapeutic play intervention as they are more vulnerable to the stress of cancer treatment and hospitalisation. However, those younger than eight may have limited verbal and cognitive capacities in expressing themselves and comprehending some of the terms in questionnaires. For this reason, only children aged 8–16 years were invited to participate in the study.

Sample size was calculated to obtain sufficient power to detect differences between the groups. The researcher predicted a medium effect size of differences between two groups based on one prior study (Li & Chung 2009) testing the effectiveness of therapeutic play intervention on children’s
pre- and postoperative anxiety. To predict this effect size of differences between two groups at a 5% significance level ($p < 0.05$) and a power of 0.80, 64 subjects in each group are normally required (Polit & Beck 2008). The data collection lasted for 14 months. A total of 122 children participated and completed the study. The response and attrition rates in the control group were 96% and 98% respectively, while those in the experimental group were 83% and 85%, respectively. Of the 122 children, 70 formed the control group and 52 the experimental group.

**Intervention**

Besides receiving usual care, children received 30-minute therapeutic play intervention using virtual reality computer games daily (five days a week). The therapeutic play intervention was conducted by research nurse and implemented in small group with maximum four children in one group in a playroom of the oncology unit. Previous studies (Cooper & Blitz 1985, LeVieux-Anglin & Sawyer 1993) pointed out that school-age children are more peer oriented and they could benefit from group teaching and learning. Moreover, it offers children an opportunity to interact with their peers and creates a non-threatening atmosphere for children to express their concern and fear. To ensure cancer children could be able to engage in virtual reality computer games, the time of implementation was flexible and repeated sessions was carried out during the day time. Participants were invited to join the play activities when they were not occupied by any medical treatments or physiological care. Before commencing the study, the research nurse received training on how to implement the intervention. To eliminate the experimenter bias effect, the research nurse responsible for data collection was independent to the research nurse responsible for administering the interventions to the subjects.

The content of therapeutic play using virtual reality computer games

The content of therapeutic play contains a variety of group playing activities, in particular involves using virtual reality through interactive stimulations created by computer hardware and software to present children with opportunities to engage in environments that appear and feel similar to real-work objects and events. Some activities are more energy-consuming and some are not. The interveners can, in accordance with children’s sex, age, ability, type of disease and general condition, select suitable virtual reality computer games for them to play. Besides, children may also have choice on types of play.

To produce virtual reality environment for children to play, a PlayMotion system was installed in a playroom of the paediatric oncology ward. PlayMotion system (Playmotion Limited, Hong Kong, China) is a device that transforms ordinary walls, floors and ceilings into wildly interactive, virtual playgrounds. It combines the flexibility of video projectors, the computer vision algorithms and the real-time special effects systems of videogames. PlayMotion requires no goggles, gloves, helmets and markers and thus making it an immediate, totally intuitive and completely natural experience. Only the shadows of moving arms are needed to enter exciting, interactive projected play spaces – from flying over a city and creating trance-like waves, ripples and colours to playing football, volleyball or billiards.

The rationales of using virtual reality technology in therapeutic play

Previous study has showed that virtual reality could provide positive and enjoyable leisure experiences during physical interactions with different game-like virtual environments and potentially lead to increased self-esteem and a sense of self-empowerment for children with physical and intellectual disabilities in clinical settings (Weiss et al. 2003). One advantage of using virtual reality for children to play is that it enables great flexibility in the way it can be interfaced with children and adapted to suit specific therapeutic goals. The child can, in accordance with his or her ability and type of disease, sit or stand while performing in the virtual environment. It is also a real opportunity to provide children with a break from the rigours of hospitalisation and treatment as well as a sense of control over their illness and have fun at the same time. Besides, virtual reality provides a platform where children with illness and unable to perform leisure activities in ‘real life’ settings, may be able to engage in them.

The effectiveness of using virtual reality as an intervention tool in rehabilitation has recently been well documented (Schultheis & Rizzo 2001, Kizony et al. 2003). There is also some evidence that multi-sensory interactive experiences are an effective method of moving children minds away from anxiety and pain (Steele et al. 2003).

**Measures**

Children’s state anxiety level

The state anxiety level of children will be measured by using the short form of the Chinese Version of the State Anxiety Scale for Children (CSAS-C). The short form of the CSAS-C consists of 10 items, which are scored from 1–3, with total possible scores ranging from 10–30. Higher scores indicate
greater anxiety. The psychometric properties of the short form of the CSAS-C have been empirically tested (Li & Lopez 2007). The results showed that the short form of the CSAS-C was highly correlated with scores obtained from the full form \((r = 0.92)\), had acceptable internal consistency \((r = 0.83)\) and good convergent validity in differentiating state anxiety of children under stressful and relaxed situations. The results of confirmatory factor analysis further added evidence of the construct validity of the short form of the CSAS-C (Li et al. 2008).

Children’s depressive symptom

Children’s depressive symptom was assessed using the Center for Epidemiologic Studies Depression Scale for Children (CES-DC). The CES-DC was derived from the Center for Epidemiologic Studies Depression Scale for Adult (CES-D) developed by Radloff (1977). The CES-D was then modified to become more child-friendly (Weissman et al. 1980). The CES-DC comprises 20 fully standardised items to evaluate depressive symptoms. The items consist of short and simple statements in the first person about the emotional, cognitive and behaviour related components of depressiveness. All items are evaluated on a four-point Likert scale in relation to their incidence during the last week, which were scored from 0–3 \((0 = \text{‘not at all,’} 1 = \text{‘a little,’} 2 = \text{‘some,’} 3 = \text{‘a lot’})\), with total possible scores ranging from 0–60, with higher scores indicating greater symptomatology. A score of 16 or greater indicates an individual demonstrating some depressive symptoms (Radloff 1977). The psychometric properties of the short form of the CES-DC have been empirically tested (Barkmann et al. 2008), showing adequate internal consistency reliability, good concurrent validity and excellent construct validity. The results of confirmatory factor analysis showed that there are four factors underlying the CES-DC, which is congruent with hypothesised configuration of the factor structure of the CES-D proposed by Radloff (1977). The four-factor version of the CES-DC is considered to have good factorial validity and stability across age (Barkmann et al. 2008).

Data collection procedures

Approval for the study was obtained from the university and hospital ethics committee. Written consent was obtained from the parents after they were told the purposes of the study. Each child was also invited to put his/her name on a special children’s consent form. The children and their parents were informed that they had the right to withdraw from the study at any time and were assured of the confidentiality of the study.

On admission to the oncology ward, demographic data of children and their parents were collected by research nurse using the demographic form. Moreover, baseline state anxiety scores and depressive symptoms of children were assessed. The state anxiety level and depressive symptoms of participants were again assessed on day 7 after admission.

Data analysis

The Statistical Package for Social Sciences (SPSS) software, version 16.5 for Windows (SPSS Inc., Chicago, IL, USA) was used for data analysis. The homogeneity of the experimental and control groups were assessed by using inferential statistics (independent \(t\)-test and \(\chi^2\)). Mixed between-within subjects ANOVA was used to determine whether therapeutic play, using virtual reality computer games, was more effective in minimising anxiety and reducing depressive symptoms of children during the first week of hospitalisation.

Results

Information on the demographic, clinical and baseline characteristics of the experimental and control groups is presented in Table 1. The results revealed that the experimental and control groups were similar with respect to the age and gender of children, education attainment of parents, medical diagnosis and baseline state anxiety cores and depressive symptoms for children, suggesting a high level of homogeneity of variance between these two groups in this study. Almost all participants had been diagnosed with cancer within the previous 12 months, with only three diagnosed more than a year before. The mean and standard deviation of the state anxiety and depressive symptom scores in children across the two time periods are presented in Table 2.

Effect of intervention on depressive symptoms of children

The results of mixed between-within subjects ANOVA (Table 3) indicated that there was a statistically significant main effect for time in the depressive symptoms scores, suggesting a change in the depressive symptoms between two groups across the two time periods. Besides, the results indicated that there was a statistically significant interaction effect, suggesting that the changes in depressive symptoms of the children over times depended on the types of intervention given. The results of between-subject effects showed that there was a statistically significant main effect for
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Effects of intervention on state anxiety of children

The results of mixed between-within subjects ANOVA (Table 3) indicated that there was a statistically significant main effect for time in the anxiety scores, suggesting a change in the state anxiety scores of children in both groups across the two time periods. Besides, the results indicated that there was a statistically significant interaction effect, indicating that the changes in the state anxiety scores of children over time depended on the types of intervention given. The results of between-subject effects showed that there was no statistically significant main effect for intervention, suggesting that there was no difference in children’s anxiety scores between the two groups on day 7.

Discussion

The purpose of this study was to examine the effectiveness of therapeutic play interventions, using virtual reality computer games, in minimising anxiety and reducing depressive symptoms in Hong Kong Chinese children hospitalised with cancer. The use of randomised controlled trial represents the most powerful method for establishing cause-and-effect relationships between variables. However, randomisation of subjects to different groups was not possible in this study, because there was a possibility of contamination between the two different treatment groups in the setting and some participants and particularly parents of child might be concerned or disturbed by experiencing a different form of nursing intervention. Given these issues, an alternative method, quasi-experimental (non-equivalent control group), pretest–post-test between-subject design was employed.

Effect of therapeutic play interventions on the state anxiety of children

The results of the study indicated that children showed quite high state anxiety on admission for cancer treatment. The results were consistent with a previous study showing that children experienced different degrees of sadness, unhappiness and worry. However, there was a slight reduction in the state anxiety scores of children on day 7, regardless of the type of intervention. This is understandable, as most of the children had undergone invasive medical procedures and cancer treatment on day 7 and their worries and anxiety might have lessened. Another reason for the reduction in anxiety level might be that children gain more sense of self-control over the unfamiliar environment and medical procedures on day 7. According to the theory of cognitive appraisal, stress and coping (Lazarus & Folkman 1984),

Table 1 Comparison of experimental and control groups on demographic, baseline and clinical characteristics (n = 122)

<table>
<thead>
<tr>
<th></th>
<th>Experimental (n = 52)</th>
<th>Control (n = 70)</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender of children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28 (53.85)</td>
<td>37 (52.86)</td>
<td>0.98 ns</td>
</tr>
<tr>
<td>Female</td>
<td>24 (46.15)</td>
<td>33 (47.14)</td>
<td></td>
</tr>
<tr>
<td>Education attainment (parents)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>5 (9.62)</td>
<td>6 (8.57)</td>
<td>0.98 ns</td>
</tr>
<tr>
<td>Lower secondary</td>
<td>16 (30.76)</td>
<td>22 (31.43)</td>
<td></td>
</tr>
<tr>
<td>Upper secondary</td>
<td>25 (48.08)</td>
<td>34 (48.57)</td>
<td></td>
</tr>
<tr>
<td>Tertiary</td>
<td>6 (11.54)</td>
<td>8 (11.43)</td>
<td></td>
</tr>
<tr>
<td>Medical diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukaemia</td>
<td>21 (40.38)</td>
<td>29 (41.43)</td>
<td>0.74 ns</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>13 (25.00)</td>
<td>17 (24.28)</td>
<td></td>
</tr>
<tr>
<td>Brain tumour</td>
<td>3 (5.77)</td>
<td>2 (2.86)</td>
<td></td>
</tr>
<tr>
<td>Germ-cell tumour</td>
<td>9 (17.31)</td>
<td>14 (20.00)</td>
<td></td>
</tr>
<tr>
<td>Osteosarcomas</td>
<td>6 (11.54)</td>
<td>8 (11.43)</td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of children</td>
<td>11.6 (2.1)</td>
<td>12.1 (2.3)</td>
<td>0.74 ns</td>
</tr>
<tr>
<td>Children's state anxiety scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children's depressive symptoms scores</td>
<td>22.31 (6.18)</td>
<td>22.11 (5.62)</td>
<td>0.92 ns</td>
</tr>
</tbody>
</table>

ns, not significant at p > 0.05.

*Group comparisons t-test for continuous and χ² for nominal and categorical variables.

Table 2 The mean state anxiety scores and depressive symptom scores in children across two time periods (n = 122)

<table>
<thead>
<tr>
<th></th>
<th>Experimental (n = 52)</th>
<th>Control (n = 70)</th>
<th>Total (n = 122)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State anxiety on admission</td>
<td>21.04 (4.90)</td>
<td>21.11 (4.66)</td>
<td>21.08 (4.73)</td>
</tr>
<tr>
<td>State anxiety scores on day 7</td>
<td>19.48 (4.73)</td>
<td>21.06 (4.52)</td>
<td>20.39 (4.66)</td>
</tr>
<tr>
<td>Depression symptom scores on admission</td>
<td>22.31 (6.18)</td>
<td>22.11 (5.62)</td>
<td>22.20 (5.82)</td>
</tr>
<tr>
<td>Depression symptom scores on day 7</td>
<td>20.60 (5.87)</td>
<td>25.97 (6.32)</td>
<td>23.68 (6.15)</td>
</tr>
</tbody>
</table>

intervention, indicating that children in the experimental group reported statistically significant fewer depressive symptoms than children in the control group on day 7. Using the commonly used guidelines proposed by Cohen (1992), the partial eta squared (0.06) indicates that the effect size for the intervention was moderate.
The individual’s evaluation of the threat is influenced by his/her perception of control over a potential threat. Therefore, it was reasoned that if children believed that they had adequate control over the environment or an upcoming medical procedure, the perception of threat would decrease. Owing to the transitory nature of anxiety, the state anxiety score of a child may vary in intensity, fluctuating from time to time as a result of exposure to different situations. However, although children in the experimental group had lower mean state anxiety scores than children in the control group on day 7, the differences were not statistically significant. One possible explanation lies in the difficulty in determining whether children’s state anxiety could be expected to respond to therapeutic play interventions, which had a more precise effect on reducing children’s depressive symptom, while state anxiety might be less responsive to such intervention. Nevertheless, when examining the effect size and power of therapeutic play intervention on children’s state anxiety scores, we found that the effect size was between small and moderate (Eta squared = 0.05), indicating therapeutic play intervention might well be effective. Additionally, the result of the power analysis was only 0.68, indicating a high chance of committing a type II error (32%). The results suggest that the relationship between type of intervention and children’s state anxiety scores on day 7 might have been affected by the limited sample size. It would therefore be interesting to see if further studies using larger samples could find a significant relationship between therapeutic play intervention and children’s state anxiety.

The effects of therapeutic play on children’s depressive symptoms scores

The results showed that most children presented some depressive symptoms during their stay in the hospital. The overall mean depressive symptom scores for children on admission and on day 7 were higher than the cut-off point (16). The findings concurred with the results of a previous local study (Li et al. 2010) showing that the course of cancer treatment has a tremendous impact on children. The results were also consistent with studies conducted in Western countries (Dejong & Fombonne 2006, Matziou et al. 2008), providing further evidence that children with cancer are at high risk of depression.

The findings suggest that there was a change in the reporting of depressive symptoms in both groups across the different time periods. However, changes over the different times were dissimilar between the experimental and control groups. Following the admission to a paediatric oncology unit, the mean depressive symptom scores among children in the control group increased, as measured on day 7. Because hospitalisation and painful medical procedures are anxiety-provoking events and can be emotionally devastating for children (Li et al. 2010), common emotional responses like worry, fear and uncertainty are likely to be meticulously reported after admission to hospital. Unlike the CSAS-C, which asks children to indicate the degree to which they are experiencing a particular feeling at the current moment, the CES-DC asks them to rate the frequency of depressive symptoms during the past week. This probably explains why children in the control group reported more depressive symptoms on day 7 than on admission. Nevertheless, in contrast to the control group, children receiving therapeutic play intervention, using virtual reality computer games, reported statistically significant fewer depressive symptoms than children in the control group. This concurred with the results of a previous study where therapeutic play was found to be effective in helping children cope with the stress of hospitalisation.

Indeed, implementing therapeutic play for children with cancer during their hospitalisation has particular advantages because serious illness and its accompanying stress and physical restriction interrupt the natural play and socialisation which are essential for children’s normal growth and development. Moreover, owing to low body resistance and susceptibility to infection, most children have relatively a few

| Table 3 The results of mixed between-within subjects ANOVA on state anxiety and depressive symptom scores in children across two time periods (n = 122) |
|-----------------------------------------------|------------------|------------------|------------------|------------------|
|                                           | State anxiety scores | Depressive symptom scores |
|                                           | F-value | p-value | Eta squared | Observed power | F-value | p-value | Eta squared | Observed power |
| Main effect for time                     | 33.03   | <0.00   | 0.21       | 0.96           | 17.18   | <0.00   | 0.13       | 0.94           |
| Interaction effect                       | 28.52   | <0.00   | 0.19       | 0.97           | 115.74  | <0.00   | 0.49       | 0.98           |
| Main effect for intervention             | 3.48    | <0.07   | 0.05       | 0.68           | 6.04    | <0.02   | 0.06       | 0.81           |

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opportunities to engage in leisure activities. The lack of opportunity to play often leads to the development of dependent behavioural patterns, learned helplessness and depression (Weiss et al. 2003). Implementing therapeutic play for children with cancer during their hospitalisation can provide more opportunity for children to engage in leisure activities, greater involvement which can improve children’s coping skills, decrease their stress and eventually link to better psychosocial adjustment to illness and hospitalisation.

Implementing therapeutic play intervention with virtual reality computer games may require some extra resources, such as those needed in the short run to purchase necessary equipments. However, this will certainly enhance the hospital’s capacity to promote quality health in the long run. Indeed, it only takes about half an hour a day of a staff nurse’s time to provide a creative recreational and psychosocial intervention to make the child’s cancer journey a less difficult one. Clearly, it would be economically feasible for the healthcare system to consider and use this intervention as part of routine nursing care for children hospitalised with cancer.

There was a considerable amount of positive feedback from children receiving therapeutic play intervention in the study hospital. One of their comments was as follows:

I was so sad because of the disease and the environment around me even made me feel more depressed as the ward was full of medical equipment and sick people. It was really boring to stay in bed all day long without anything to do. I never thought there would be some virtual computer games introduced to the ward. It occupied my time or at least let me forget any unhappy event ahead…I was so relaxed while I was playing.

Limitations

This study was limited in that all data were collected in one setting, which might limit the ability to generalise the result. Another limitation was that, in contrast to the control group, the response rate was comparatively low, but with a higher attrition rate in the experimental group. There are some factors that shed light on these issues. First, some children refused to participate in the play activities after receiving chemotherapy. Indeed, fatigue after chemotherapy was one of the most common physical concerns reported by child cancer patients that prevented them from joining any energy-consuming activities (Whitsett et al. 2008). Second, there are some misconceptions about therapeutic play interventions among parents. Some parents showed reluctance to let their children join the intervention as they thought that resting rather than play was the most appropriate method for their recovery, particularly during the acute phase of cancer treatment. Moreover, for fear of their contracting infectious diseases, some parents did not encourage their children to engage in close social contact with other hospitalised children. One more limitation of this study was related to the recruitment issue. There was an outbreak of human swine influenza (H1N1) in Hong Kong at the time of data collection in Phase two. According to the Hong Kong Hospital Authority’s policy, all non-medical-related activities, including therapeutic play intervention, were suspended during this period and as a result only 52 subjects were recruited to the experimental group before the policy commenced.

Conclusion

Notwithstanding these potential limitations, the study has addressed a gap in the literature by systematically researching the effects of therapeutic play intervention, using virtual reality computer games, on the outcomes of children hospitalised with cancer. Its most important contributions is empirical evidence to support the effectiveness of using therapeutic play intervention in helping children hospitalised with cancer ease the burden of cancer treatment and making their cancer journey less difficult.

Relevance to clinical practice

Results from the present study provide empirical evidence of the benefits of incorporating therapeutic play in helping children ease the psychological burden of cancer treatment and hospitalisation, thus charting a path towards promoting holistic and quality care. It is anticipated that the findings of this empirical study will promote awareness in nurses and parents that play is a very important part of children’s life and that they need play even when they are ill. Additionally, the findings will contribute to promoting nurses’ accountability and responsibility for patient care through evidence-based practice.

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Contributions

Study design: WHCL; data collection and analysis: EKYH and manuscript preparation: WHCL, JOKC, EKYH.

Conflict of interest

No conflict of interest has been declared by the authors.
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