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Original Research Article

Effectiveness of play therapy in reducing anxiety among hospitalized children aged 6-12 years: a quasi-experimental study

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ABSTRACT

Background: This study examined whether a structured play therapy programme lowers anxiety in hospitalized children.
Methods: A non-equivalent control group pre-test/post-test quasi-experimental design was used. Sixty children aged 6–12 years admitted to pediatric wards were allocated by ward to an intervention group (n=30) or a control group (n=30). The intervention group received routine care plus five daily 30–40-minute play therapy sessions, the control group received routine care only. Anxiety was measured with the State-Trait Anxiety Inventory for Children at baseline and after the fifth day. Data were analysed with paired and independent t-tests, Fisher's exact and chi-square tests, and analysis of covariance.
Results: The groups were comparable at baseline (mean anxiety 47.03±5.17 vs 45.70±4.17, p=0.276). After the intervention, mean anxiety fell from 47.03 to 36.53 in the intervention group and from 45.70 to 42.43 in the control group. After adjusting for baseline scores, the intervention group had a significantly lower post-test score (adjusted mean difference =−6.89, 95% CI −9.35 to −4.43; F (1,57) =31.49, p<0.001; partial η^2=0.36). The proportion of children with high anxiety (score ≥40) fell from 90.0% to 30.0% in the intervention group compared with 90.0% to 76.7% in the control group (p<0.001).
Conclusions: Structured play therapy was associated with a clinically meaningful reduction in anxiety among hospitalized school-age children. Pediatric nurses can incorporate it as a low-cost adjunct to routine care.

Keywords: Play therapy, Anxiety, Hospitalized child, Pediatric nursing, Quasi-experimental study, School-age children

INTRODUCTION

Admission to hospital removes a child from home, family routines and familiar peers, and exposes them to unfamiliar people, equipment, procedures and pain. For children between six and twelve years, who understand enough to imagine what might happen but not enough to judge risk realistically, this combination commonly produces worry, restlessness, sleep disturbance, and withdrawal or resistance during care.[1,2] Higher anxiety around medical care has also been linked to poorer cooperation and more distress-related behaviour after discharge.[3]

Play is the main language through which children make sense of their world. Developmental theory holds that children use symbolic and imaginative play to work through experiences they cannot yet put into words and play-based therapy was developed on the premise that a safe, accepting relationship combined with play materials allows a child to express and resolve emotional difficulty.[4-6]

A meta-analytic review of controlled outcome studies reported a moderate to large overall effect of play-based interventions on child emotional and behavioural outcomes.[7] In hospital settings, systematic evidence indicates that play interventions can reduce anxiety and negative emotion, although trials vary in quality and the type of play used.[8,9] Related work with clown and computer-game based interventions likewise reports lower worry and improved psychological well-being in hospitalized children.[9,10]

Despite this evidence, structured play is still seldom part of routine ward care in many low and middle-income settings, where nurse workloads are high and children's emotional needs are often overshadowed by clinical priorities. Local evidence in the age group of 6-12 years is limited. The present study therefore aimed to evaluate the effectiveness of a nurse-delivered structured play therapy programme in reducing anxiety among hospitalized children aged 6-12 years.

METHODS

A quasi-experimental, non-equivalent control group, pre-test/post-test design was used. The study was carried out in the pediatric medical and surgical wards of Government hospital in South India over a three-month period (from Jan 2022 to March 2022). Because two physically separate wards were available and children in shared spaces could interact, allocation was by ward to limit contamination, children admitted to Ward A formed the intervention group and those in Ward B formed the control group. Randomization was not feasible for this reason, and this is acknowledged as a design limitation.

Sample size

The sample size was estimated for a two-group comparison of mean post-test anxiety using a two-tailed test at $\alpha=0.05$ and 80% power, assuming a large standardized effect (Cohen's $d=0.8$) based on earlier play-intervention studies.[8,11,12]

This gave a minimum of 26 children per group; the target was raised to 30 per group to allow for attrition, giving a total of 60. Children were enrolled consecutively until each group reached 30. No child dropped out and all 60 completed both assessments.

Inclusion criteria

age 6–12 years; admitted for at least five days; conscious, alert and able to communicate in Kannada, English and Hindi parent or guardian present and willing to consent, and child willing to assent.

Exclusion criteria

Admission to intensive care, diagnosed psychiatric or neurodevelopmental disorder, or hearing and visual impairment that would prevent participation in play, terminal illness, isolation precautions that prevented group materials from being used, previous exposure to structured play therapy during the study admission.

Instruments

Data were collected using two tools. Tool 1 was a structured proforma recording age, gender, diagnosis category, parental education, previous hospitalization and length of stay. Tool 2 was the State Anxiety scale of the State-Trait Anxiety Inventory for Children (STAIC), a 20-item self-report measure in which the child rates how they feel "right now" on a three-point scale.[13] Total scores range from 20 to 60, with higher scores indicating greater anxiety. For the purposes of this study, a score of 40 or above was defined a priori as "high anxiety". The tool was administered by the researcher in an interview format to accommodate younger children's reading levels. Content validity of the proforma was established by five experts in pediatric nursing and child psychology.

Intervention

The play therapy programme was developed from child-centred play therapy principles and reviewed by a child psychologist and two pediatric nurses.[5,6] Each child in the intervention group received one individual session per day for five consecutive days, lasting 30-40 minutes, in the ward playroom or at the bedside when mobility was restricted. Sessions were delivered by the researcher, who had completed a structured training in therapeutic play.

A typical session followed four stages: a short rapport-building period; free choice plays with drawing materials, clay, building blocks, storybooks or puppets; medical play in which children handled safe, child-sized equipment (stethoscope, bandages, a doll for "giving injections") to rehearse and talk about hospital experiences; and a calming close with a relaxation game. The researcher followed the child's lead, reflected feelings and did not force disclosure. The control group received routine ward care only and were offered the same play activities after the study ended.

Data collection procedure

Permission was obtained from the hospital administration and the heads of the departments. After consent and assent, baseline demographic data and the pre-test were

collected from every child on the day of enrolment (day 1) before any session. The post-test was administered on day 6, approximately 30 minutes after the fifth session in the intervention group and at the same time of day in the control group. To reduce bias, the post-test in both groups was scored by a second nurse who was not aware of group allocation, although complete blinding of participants and the delivering researcher was not possible.

Ethical considerations

The study protocol was approved by the Institutional Ethics Committee. Written informed consent was obtained from parents or guardians and verbal assent from each child, in line with the Declaration of Helsinki.[14] Participation was voluntary, withdrawal was possible at any time without affecting treatment, and confidentiality was maintained through coded data. A child who became distressed during a session was allowed to stop and was supported by the nursing staff.

Statistical analysis

Data were analysed using IBM SPSS Statistics version 20.0 Categorical variables were summarized as frequencies and percentages and compared between groups using Fisher's exact test (2×2 tables) or the chi-square test. Continuous variables were summarized as mean±standard deviation (SD). The Shapiro–Wilk test showed that pre-test, post-test and change scores were approximately normal in both groups (all $p>0.05$), and Levene's test showed equal variances of post-test scores ($p=0.358$), parametric tests were therefore used. Within group changes were tested with paired t-tests and between-group differences with independent t-tests. The primary analysis was ANCOVA comparing post-test scores between groups with the pre-test score as the covariate, which is preferable to a simple comparison of change scores in non-randomized designs.[15] Effect sizes were reported as Cohen's d and partial eta squared (η^2p), interpreted using Cohen's conventions.[12] All tests were two-tailed and $p<0.05$ was considered statistically significant.

RESULTS

All 60 children (30 per group) completed the study, there was no attrition or missing data. The two groups were similar in age, gender, age band, diagnosis category, parental education, previous hospitalization and length of stay (Table 1). None of the differences was statistically significant, suggesting that the groups were comparable at baseline in the measured characteristics.

Anxiety before and after the intervention

Baseline anxiety did not differ between groups (Table 2). At post-test, mean anxiety was 5.90 points lower in the intervention group than in the control group, a statistically significant difference with a large effect size (Cohen's d=1.01).

Within-group changes

Anxiety declined significantly in both groups, but the fall was far larger in the intervention group (Table 3). The intervention group's mean score dropped by 10.50 points (22.3% of baseline), compared with 3.27 points (7.1%) in the control group. The smaller improvement in the control group is consistent with natural adaptation to the ward over time.

Effectiveness of play therapy (primary analysis)

Table 4 shows that the reduction in anxiety was 7.23 points greater in the intervention group than in the control group (95% CI 4.74 to 9.72; d=1.50). To account for the slight baseline difference between the non-randomized groups, an ANCOVA was performed with pre-test anxiety as the covariate (Table 5). Baseline anxiety was itself a significant predictor of post-test scores ($F(1,57)=31.87$, $p<0.001$). After adjustment, the adjusted post-test mean was 36.04 in the intervention group and 42.93 in the control group, a difference of 6.89 points (95% CI 4.43 to 9.35). Group membership explained about 36% of the variance in post-test anxiety not accounted for by baseline scores ($\eta^2p=0.36$, a large effect). The null hypothesis was therefore rejected and the research hypothesis accepted.

Proportion of children with high anxiety

At baseline, 27 of 30 children (90.0%) in each group scored 40 or above. After the intervention, only 9 children (30.0%) in the play therapy group remained in the high-anxiety range, compared with 23 children (76.7%) in the control group (Fisher's exact $p<0.001$ Table 6). The absolute risk reduction attributable to the programme was 46.7 percentage points, so approximately two children would need to receive the programme for one additional child to fall below the high-anxiety threshold.

Table 1: Baseline characteristics of the participants and homogeneity of groups (n=60).

Characteristics	Intervention (n=30)	Control (n=30)	Test statistic; P value
Age in years, mean±SD	9.30±1.58	9.13±1.55	t(58)=0.41; p=0.681
Age band, N (%)			Fisher's exact; p=1.000
6–8 years	13 (43.3)	12 (40.0)	
9–12 years	17 (56.7)	18 (60.0)	

Continued.

Characteristics	Intervention (n=30)	Control (n=30)	Test statistic; P value
Gender, N (%)			Fisher's exact; p=0.606
Male	16 (53.3)	13 (43.3)	
Female	14 (46.7)	17 (56.7)	
Reason for admission, N (%)			$\chi^2(3)=0.27$; p=0.965
Respiratory	9 (30.0)	8 (26.7)	
Gastrointestinal	8 (26.7)	9 (30.0)	
Febrile/infectious illness	7 (23.3)	6 (20.0)	
Other	6 (20.0)	7 (23.3)	
Parental education, N (%)			$\chi^2(2)=0.10$; p=0.951
Up to secondary	7 (23.3)	8 (26.7)	
Higher secondary	15 (50.0)	14 (46.7)	
Graduate or above	8 (26.7)	8 (26.7)	
Previous hospitalization, N (%)	12 (40.0)	14 (46.7)	Fisher's exact; p=0.795
Length of stay in days, mean±SD	7.03±1.85	6.47±1.93	t(58)=1.16; p=0.249

SD=standard deviation. p>0.05 for all comparisons (not significant).

Table 2: Comparison of state anxiety scores between groups at pre-test and post-test.

Time point	Intervention (n=30) Mean±SD	Control (n=30) Mean±SD	Independent t-test (df=58); P value
Pre-test	47.03±5.17	45.70±4.17	t=1.10; p=0.276
Post-test	36.53±6.07	42.43±5.57	t=−3.92; p<0.001

Score range 20–60; higher scores indicate greater anxiety. Cohen's d for post-test difference=1.01.

Table 3: Within-group change in anxiety scores from pre-test to post-test.

Group	Pre-test Mean±SD	Post-test Mean±SD	Mean reduction±SD (95% CI)	Paired t-test (df=29); P value	Cohen's dz
Intervention	47.03±5.17	36.53±6.07	10.50±4.13 (8.96 to 12.04)	t=13.94; p <0.001	2.55
Control	45.70±4.17	42.43±5.57	3.27±5.43 (1.24 to 5.29)	t=3.30; p=0.003	0.60

CI = confidence interval. Mean reduction = pre-test minus post-test.

Table 4: Comparison of anxiety reduction (change scores) between groups.

Group	Reduction mean±SD	% reduction from baseline	Independent t-test (df=58)
Intervention (n=30)	10.50±4.13	22.3%	t=5.81; p <0.001
Control (n=30)	3.27±5.43	7.1%	Mean difference=7.23 (95% CI 4.74 to 9.72); d=1.50

Table 5: ANCOVA of post-test anxiety scores adjusted for baseline anxiety.

Source / group	Adjusted mean	F (df)	P value	Effect size
Intervention (adjusted)	36.04			
Control (adjusted)	42.93			
Group effect (adjusted difference= −6.89; 95% CI −9.35 to −4.43)		F (1,57) =31.49	<0.001	η^2p=0.36
Baseline anxiety (covariate)		F (1,57) =1.87	<0.001	—

Adjusted means are evaluated at the overall mean baseline score (46.37). Regression slope for baseline anxiety=0.74.

Table 6: Distribution of children with high anxiety before and after the intervention.

Anxiety category (score)	Intervention (n=30)	Control (n=30)	Fisher's exact P value
Pre-test: high (≥ 40), N (%)	27 (90.0)	27 (90.0)	1.000
Post-test: high (≥ 40), N (%)	9 (30.0)	23 (76.7)	<0.001
Post-test: below 40, N (%)	21 (70.0)	7 (23.3)	

High anxiety is a study-defined descriptive cut-off (score ≥ 40), not a validated clinical threshold.

DISCUSSION

This quasi-experimental study examined whether five days of structured play therapy could lower anxiety in hospitalized children aged 6-12 years. The intervention group showed a large fall in state anxiety, and this remained significant after adjusting for baseline anxiety. Only the play therapy group moved substantially out of the high-anxiety range, and the size of the effect (d ≈ 1.0-1.5) is large by conventional standards.[12]

The finding agrees with a systematic review reporting that play interventions reduce anxiety and negative emotion in hospitalized children and with earlier controlled work in children with cancer, in which therapeutic play improved psychological well-being.[8,9] It is also consistent with meta-analytic evidence of a moderate to large benefit of play-based therapy on child emotional outcomes.[7] Our effect is somewhat larger than the averages reported in those syntheses. This may reflect the short interval between the intervention and the post-test, the use of self-reported state anxiety, which is sensitive to immediate mood, and the fact that the researcher delivering the programme also had a strong rapport-building role. The result should therefore be read as the immediate effect of the programme, not necessarily its lasting effect.

Several mechanisms could explain the benefit. Medical play allows children to handle unfamiliar equipment in a non-threatening way, which may correct frightening misconceptions and restore some sense of control, a factor consistently identified as important in children's accounts of hospitalization.[2] Symbolic play also provides an outlet for feelings that school-age children may find hard to state directly.[4,5] In addition, the individual attention given during sessions may itself have been comforting and helped to offset separation from home. Because the study cannot separate these ingredients, it is not possible to say which contributed most.

Anxiety also declined modestly in the control group (7.1% of baseline). Children commonly become more settled as they become accustomed to the ward and as their illness improves, and repeated measurement can lower scores. Including a comparison group and adjusting for baseline scores allowed the effect of play therapy to be distinguished from this natural adaptation. The fact that anxiety was high at baseline in 90% of children in both groups, in line with reports that pre-procedural and admission anxiety is common in children, underlines the size of the unmet need.[3] From a practical standpoint, the programme required inexpensive materials and about 3 hours of nurse time per child over five days. It is well suited to pediatric wards in resource-limited settings, and could be delivered by trained nurses, child life workers or trained volunteers under supervision.

Strengths and limitations

Strengths include a clearly described and reproducible intervention, use of an established child anxiety measure, a comparison group, complete follow-up, and an analysis that adjusted for baseline anxiety and reported effect sizes with confidence intervals. Limitations should be noted. First, allocation was by ward rather than by random assignment, so unmeasured differences between wards (for example, staffing or environment) may have influenced results. Second, the researcher who delivered the intervention could not be blinded, and children's self-reports may have been influenced by expectation. Third, the sample was small and drawn from a single centre, limiting generalizability. Fourth, anxiety was assessed only once after the intervention, so the durability of the effect is unknown; physiological or observer-rated measures were not included. Finally, the intervention was multi-component, so its active elements cannot be isolated.

CONCLUSION

In this quasi-experimental study, a five-day structured play therapy programme produced a significantly greater reduction in anxiety than routine care among hospitalized children aged 6–12 years, with a large effect that persisted after adjustment for baseline anxiety. If confirmed in real-world randomized studies, play therapy should be considered a standard, nurse-led component of paediatric care.

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