Universal Journal of Public Health 13(6): 1522-1535, 2025 http://www.hrpub.org
DOI: 10.13189/ujph.2025.130612

Storytelling-Based Communication in Child Health: Cultural and Digital Interventions for Anxiety Reduction in Hospitalized Preschool Children − A Systematic Review and Meta-Analysis

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Received May 25, 2025; Revised October 11, 2025; Accepted October 24, 2025

Cite This Paper in the Following Citation Styles

(a): *[1] Citra Suraya, Aris Citra Wisuda, Tukimin bin Sansuwito, Regidor III Dioso, Suzanna, Arena Lestari, Sri Tirtayanti, Muhamad Andika Sasmita Saputra , "Storytelling-Based Communication in Child Health: Cultural and Digital Interventions for Anxiety Reduction in Hospitalized Preschool Children − A Systematic Review and Meta-Analysis," Universal Journal of Public Health, Vol. 13, No. 6, pp. 1522 - 1535, 2025. DOI: 10.13189/ujph.2025.130612.*

(b): *Citra Suraya, Aris Citra Wisuda, Tukimin bin Sansuwito, Regidor III Dioso, Suzanna, Arena Lestari, Sri Tirtayanti, Muhamad Andika Sasmita Saputra (2025). Storytelling-Based Communication in Child Health: Cultural and Digital Interventions for Anxiety Reduction in Hospitalized Preschool Children − A Systematic Review and Meta-Analysis. Universal Journal of Public Health, 13(6), 1522 - 1535. DOI: 10.13189/ujph.2025.130612.*

Abstract Background: Hospitalization can trigger significant anxiety in preschool-aged children, affecting recovery and cooperation with care. Storytelling, especially when culturally adapted or digitally delivered, has emerged as a promising basic communication strategy to alleviate such distress. Objective: This review examined the cultural adaptability and digital potential of storytelling in pediatric care, comparing its effectiveness with alternative therapeutic approaches for reducing anxiety in hospitalized preschool children. Methods: A systematic search of PubMed, Scopus, Web of Science, CINAHL, PsycINFO, Cochrane Library, and Google Scholar was conducted from inception to April 2025. Eligible studies included randomized controlled trials and quasi-experimental designs involving traditional, culturally adapted, or technology-assisted storytelling interventions in hospitalized preschool children. Two reviewers independently performed study selection, quality appraisal, and data extraction. Random-effects meta-analysis and meta-regression explored subgroup effects by cultural adaptation, delivery mode, and implementer training. All computations were conducted using RevMan 5.4 and STATA 16. Results: Twelve studies with 1,048 participants from seven countries met the inclusion criteria. Storytelling significantly reduced anxiety compared with standard care or alternative activities (Hedges' $g = -0.84$, 95% CI: −1.07 to −0.61, $p < 0.001$). Culturally adapted stories had greater effects than non-adapted formats, while digital delivery provided benefits comparable to in-person methods. Structured implementer training improved outcomes by about 18%. Storytelling was more effective than game-based interventions for procedural anxiety but showed similar results during prolonged hospitalization. Conclusion: Culturally tailored and digitally enhanced storytelling is an effective, adaptable, and feasible approach to reducing anxiety in hospitalized preschool children. Incorporating it into pediatric care training may support wider clinical application.

Keywords Storytelling, Child Health, Cultural

Adaptation, Digital Health, Anxiety Reduction

1. Introduction

Hospitalization constitutes a profound psychological stressor for preschool-aged children, often precipitating heightened anxiety due to unfamiliar environments, separation from caregivers, and exposure to invasive medical procedures [1,2]. Globally, anxiety disorders affect approximately 13.2% of boys and 15.1% of girls aged 6–9 years, with hospitalization known to further elevate these rates. Similar prevalence trends have been documented across Asian contexts, underscoring the global and cross-cultural relevance of hospitalization-related anxiety [3]. In Indonesia, a study at Santa Elisabeth Hospital, Medan, revealed that 67.1% of hospitalized preschool children experienced severe anxiety, reflecting an urgent need for interventions that are both culturally sensitive and evidence-based [4].

The impact of hospitalization-induced anxiety extends far beyond transient emotional distress. It can manifest as behavioral disturbances, hinder recovery, and negatively affect physiological as well as neurodevelopmental outcomes [5]. Persistent anxiety may result in resistance to medical procedures, prolonged hospital stays, and an increased risk of long-term psychological consequences. Addressing this anxiety is therefore essential, as unmanaged emotional distress can have enduring implications for a child's health, development, and overall well-being [6].

Within this context, nurses are central to mitigating anxiety through the principles of atraumatic and family-centered care. These approaches emphasize minimizing the psychological burden of hospitalization by safeguarding emotional stability and fostering trust. Evidence-based strategies such as therapeutic play, active parental participation, and developmentally appropriate communication have been shown to reduce anxiety levels [7-9]. The effectiveness of these strategies depends on the nurse's ability to deliver interventions tailored to the child's cognitive and emotional developmental stage, thus ensuring relevance and impact.

Storytelling has emerged as a particularly promising therapeutic communication strategy in pediatric nursing, capable of alleviating anxiety and strengthening the nurse–child relationship [1,10]. By incorporating narratives that mirror children's experiences and cultural backgrounds, storytelling facilitates emotional expression, supports cognitive processing, and restores a sense of control in a hospital setting. When combined with visual aids, interactive elements, or digital platforms, storytelling can transcend traditional formats, making it adaptable to diverse learning styles and cultural contexts [11,12]. This aligns with atraumatic care principles, where communication is individualized, empathetic, and developmentally appropriate.

Empirical evidence supports storytelling as a low-cost, accessible, and effective non-pharmacological intervention. Studies in Indonesia have demonstrated that storytelling using picture books significantly reduces anxiety in hospitalized preschool children [13-15], while Yunike et al. [16] confirmed the benefits of play-based interventions that incorporate storytelling in pediatric care. Nonetheless, variability in study design, delivery formats, cultural adaptation, and comparative effectiveness with other interventions (e.g., game therapy) has led to inconsistent findings [15,17]. These gaps necessitate a systematic review and meta-analysis to synthesize existing evidence, explore cultural and digital dimensions, and evaluate comparative effectiveness [18-20]. Therefore, this study aims to provide a rigorous synthesis to inform clinical decision-making and guide the standardized integration of storytelling-based communication into pediatric nursing practice.

2. Material and Methods

This systematic review and meta-analysis adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [21], ensuring methodological rigor, transparency, and reproducibility. The review protocol was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO) under Registration Number CRD42025213579, thereby minimizing the risk of duplication and enhancing credibility.

2.1. Eligibility Criteria

2.1.1. Population

This review included studies focusing on preschool-aged children hospitalized in various clinical settings. Following the definition in [22], preschool children were classified as those aged between 3 and 6 years. Eligible studies specifically examined anxiety-related experiences within this population, ensuring the findings were directly relevant to pediatric nursing contexts.

2.1.2. Intervention

The intervention of interest was storytelling as the primary therapeutic strategy for reducing anxiety in hospitalized children. Storytelling was defined broadly to encompass culturally rooted oral narratives, picture book reading, puppetry, and technology-assisted formats such as digital storytelling platforms. Interventions could be delivered in individual or group sessions, facilitated by nurses, parents, or through multimedia tools. Studies were excluded if storytelling was combined with another major therapeutic modality (e.g., art therapy, music therapy), unless the independent effects of storytelling could be

clearly distinguished.

2.1.3. Outcomes

The primary outcome of interest was anxiety reduction, assessed using self-reported, parent-reported, or observational measures validated for children. Studies were required to employ standardized anxiety assessment tools such as the State-Trait Anxiety Inventory for Children (STAI-C), Modified Child Anxiety Scale, or equivalent validated instruments to ensure comparability and reliability across findings.

2.2. Study Design

This systematic review and meta-analysis incorporated quantitative studies that rigorously evaluated the effectiveness of storytelling interventions, both culturally based and digitally mediated, within pediatric nursing contexts for anxiety reduction. Eligible study designs included randomized controlled trials (RCTs), cluster-randomized trials, quasi-experimental designs, and pre–post intervention studies with measurable pre- and post-treatment outcomes. Only peer-reviewed articles published in English were considered to ensure methodological transparency and reproducibility. Studies were required to report sufficient statistical data to enable effect size calculation. Observational studies, qualitative research, narrative reviews, case reports, conference abstracts, and non-peer-reviewed sources were excluded to maintain the robustness and internal validity of the evidence base. This criterion ensured that the synthesis focused exclusively on high- to moderate-quality empirical studies capable of providing comparative effectiveness insights across cultural and digital storytelling modalities in pediatric nursing.

2.3. Search Strategy

A comprehensive and systematic literature search was undertaken to identify empirical studies evaluating the cultural adaptability and digital dimensions of storytelling in pediatric nursing for anxiety reduction among hospitalized preschool children. Seven major databases—PubMed, Scopus, Web of Science, CINAHL, PsycINFO, Cochrane Library, and Google Scholar were searched from their inception to April 2025. The search strategy combined controlled vocabulary (e.g., MeSH terms) and free-text keywords, including “storytelling”, “nursing communication”, “hospitalization”, “preschool children”, “cultural adaptation”, “digital storytelling”, and “anxiety”. Boolean operators (AND, OR) and truncation symbols were applied to maximize retrieval sensitivity and specificity.

To ensure comprehensive coverage, the search was supplemented by manual screening of reference lists from all included studies and relevant systematic reviews. No restrictions were applied regarding geographical location or cultural context, provided the study was published in English and met the inclusion criteria. The complete database-specific search strings are provided in Figure 1. This approach ensured the capture of both traditional and technology-assisted storytelling interventions, allowing for a robust comparative analysis across diverse cultural and delivery modalities.

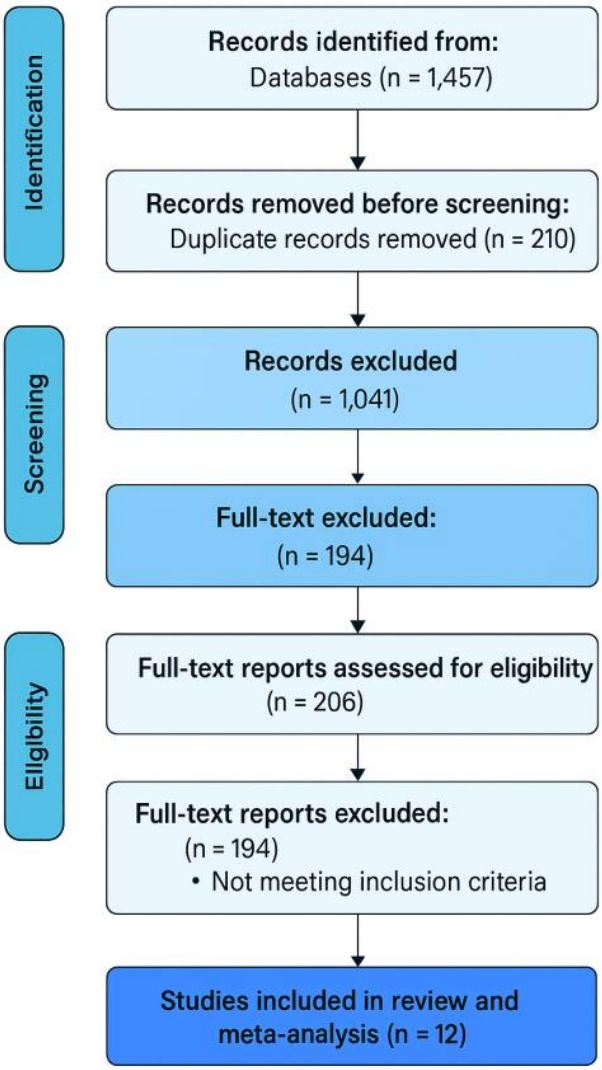

Figure 1. PRISMA Flow Diagram of the Study Selection Process

2.4. Study Selection

All identified records from the systematic search were imported into EndNote 21 for de-duplication. Two independent reviewers conducted a stepwise screening process, beginning with titles and abstracts to assess preliminary relevance based on the inclusion criteria specifically, randomized controlled trials and quasi-experimental studies evaluating traditional, culturally adapted, or digitally delivered storytelling interventions in hospitalized preschool children. Full-text articles were retrieved for studies meeting the eligibility requirements or requiring further clarification. Discrepancies in selection

decisions were resolved through consensus discussions, and when agreement could not be reached, a third senior reviewer served as an adjudicator. This rigorous multi-stage screening ensured the inclusion of studies directly aligned with the review's focus on the cultural adaptability, digital delivery, and comparative effectiveness of storytelling for anxiety reduction in pediatric nursing contexts.

2.5. Data Extraction

Data extraction was conducted using a standardized form specifically developed to comprehensively capture all information relevant to evaluating the cultural and digital dimensions of storytelling in pediatric nursing [23]. The extracted data covered study characteristics (author, year of publication, country of origin, and study design), sample details (number of participants, preschool age range, gender distribution, and health conditions during hospitalization), and intervention features (type of storytelling, traditional, culturally adapted, or technology-assisted; narrative content; cultural adaptation strategies; duration and frequency of sessions; and delivery mode, whether facilitated directly by nurses, parents, caregivers, or through multimedia platforms). Information on comparator groups, when applicable, was also recorded, including the type of control condition such as standard care or alternative therapeutic activities. Outcome measures encompassed pre- and post-intervention anxiety scores, assessment instruments (e.g., STAI-C or equivalent validated tools), and key statistical results suitable for inclusion in the meta-analysis. Two reviewers independently performed data extraction and cross-verified all entries to ensure completeness and accuracy. Any discrepancies were resolved through discussion, with arbitration by a third reviewer if necessary. For studies involving multiple intervention arms, data specifically related to storytelling were either isolated or appropriately pooled using established statistical procedures. This rigorous extraction process ensured consistent documentation of variables associated with cultural adaptation, digital delivery, and implementer training, enabling robust subgroup and meta-regression analyses.

2.6. Methodological Quality Appraisal

The methodological rigor of the included studies was independently appraised to ensure the reliability of findings regarding the cultural and digital dimensions of storytelling in pediatric nursing. Randomized controlled trials were evaluated using the Cochrane Risk of Bias tool (RoB 2.0), while quasi-experimental studies were assessed with the Joanna Briggs Institute (JBI) Critical Appraisal Checklist, each addressing key domains such as random sequence generation, allocation concealment, blinding of participants and outcome assessors, completeness of outcome data, and selective outcome reporting [24,25]. Based on these evaluations, each study was classified as having a low, moderate, or high risk of bias. To determine the overall certainty of evidence across studies, the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework was applied, considering five core factors: risk of bias, inconsistency of results, indirectness of evidence, imprecision of effect estimates, and potential publication bias. GRADEpro software was used to compile and generate detailed evidence profile tables, providing a transparent synthesis of the strength and quality of evidence for each outcome [26]. This dual-level appraisal ensured that conclusions drawn from the meta-analysis were firmly grounded in high-quality, systematically evaluated research.

2.7. Data Synthesis and Statistical Analysis

Data synthesis was conducted to quantitatively evaluate the comparative effectiveness of culturally adapted and digitally delivered storytelling interventions in pediatric nursing for anxiety reduction among hospitalized preschool children. All statistical computations were performed using Review Manager (RevMan) version 5.4 and STATA version 16. For continuous outcomes, standardized mean differences (SMDs) with 95% confidence intervals (CIs) were calculated employing the inverse variance method. Statistical heterogeneity across studies was assessed using Cochran's Q and the I^2 statistic, interpreted as low (≤40%), moderate (30–60%), substantial (50–90%), or considerable (75–100%) [27]. When heterogeneity was minimal ($I^2 < 50\%$, $p > 0.1$), a fixed-effects model was applied; otherwise, a random-effects model was used to account for between-study variability. Sensitivity analyses were performed by sequentially excluding individual studies to examine the stability of the pooled effect estimates. Subgroup analyses explored potential moderators, including geographic region, cultural adaptation of storytelling content, delivery mode (in-person vs. digital), and type of anxiety assessment tool. Additionally, meta-regression was employed to investigate the influence of implementer training on intervention outcomes, aligning with the review's focus on cultural and technological dimensions. Publication bias was examined using Begg's test, with a p-value of less than 0.05 considered statistically significant [28]. This integrated analytical strategy ensured a robust evaluation of both cultural and digital storytelling interventions within the broader context of pediatric nursing practice.

2.8. Ethical Considerations

This systematic review and meta-analysis, focusing on the cultural and digital dimensions of storytelling in pediatric nursing for anxiety reduction among hospitalized preschool children, obtained ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, Universitas Sriwijaya. The ethical review process was conducted between March 18 and April 8,

2024, and formal approval was granted under reference number 027-2024. All procedures adhered to the ethical principles outlined in the Declaration of Helsinki and complied with relevant institutional and international research guidelines. In the primary studies included, informed consent was obtained in writing from the legal guardians of all participating children, ensuring voluntary participation, protection of personal data, and the assurance of anonymity. Participants and their guardians were informed of their right to withdraw at any stage without consequence. Additional attention was given to the ethical management of culturally adapted and digitally delivered storytelling interventions, particularly in safeguarding cultural integrity, protecting digital privacy, and ensuring content suitability for preschool-aged audiences. This ethical rigor aimed to uphold the dignity, safety, and well-being of all child participants while maintaining the integrity of the research process.

3. Results

3.1. Study Search and Selection Results

The comprehensive search across PubMed, Scopus, Web of Science, CINAHL, PsycINFO, Cochrane Library, and Google Scholar yielded 1,457 potentially relevant records, which were imported into EndNote for reference management. After removing 210 duplicates, 1,247 unique records underwent title and abstract screening, resulting in the exclusion of 1,041 articles that did not meet the research objectives. Full-text review was conducted for 206 articles, with 194 excluded for failing to satisfy the eligibility criteria. Ultimately, 12 studies met all inclusion requirements and were retained for this systematic review and meta-analysis. The selection process is summarized in the PRISMA flow diagram (Figure 1).

The included studies originated from seven countries, predominantly Iran, Indonesia, Egypt, and India and encompassed randomized controlled trials (RCTs) and quasi-experimental designs. All studies examined the effects of storytelling-based nursing interventions whether traditional, culturally adapted, or digitally delivered on reducing anxiety in hospitalized preschool-aged children [29–40].

3.2. Study Characteristics

The 12 included studies were conducted between 2020 and 2025, involving a combined sample of 1,048 hospitalized preschool children aged 3–6 years, most of whom underwent surgical or invasive medical procedures. Six studies employed RCT designs, while the remaining six used quasi-experimental methods. Storytelling delivery modes varied widely, including printed storybooks, culturally adapted narratives, interactive picture flashcards, finger puppets, audio-recorded tales, and digital formats such as videos and mobile applications.

Cultural adaptation emerged as a key intervention element, with several studies tailoring stories to local traditions, languages, and values. Digital storytelling often delivered via tablets or smartphones was found to be both accessible and engaging, producing anxiety reduction comparable to in-person delivery. Beyond anxiety, three studies also measured additional outcomes such as fear reduction and improved sleep quality. A detailed summary of each study's characteristics, including design, sample size, intervention format, and measurement tools, is provided in Table 1.

Anxiety was measured using 11 validated instruments. The most frequently used tools were the State-Trait Anxiety Inventory for Children (STAIC) (n = 2), the Spence Children's Anxiety Scale (SCAS, including preschool versions) (n = 2), and the Revised Children's Manifest Anxiety Scale (RCMAS) (n = 2). Other tools included the Zung Self-Rating Anxiety Scale (ZSAS), Hamilton Anxiety Rating Scale (HARS), Facial Anxiety Scale (FAS), Animated Emoji Scale (AES), Observational Scale of Behavioral Distress–Revised (OSBD-R), and researcher-developed observational checklists.

3.3. Quality Assessment

Risk of bias, assessed with the Cochrane Risk of Bias Tool, showed that most studies presented moderate bias levels, primarily due to challenges in blinding participants and personnel. Evidence certainty, determined using the GRADE approach, classified eight studies as providing high-certainty evidence and four as moderate certainty, with none rated as low or very low. High-certainty studies were predominantly RCTs with strong methodological designs, sufficient sample sizes, and consistent reporting. Detailed bias assessments and GRADE ratings are presented in Table 2, with visual summaries in Supplementary File 1 (Figure 3).

3.4. Meta-Analysis Results

The meta-analysis of 12 studies demonstrated that storytelling-based nursing interventions significantly reduced anxiety compared with standard care or alternative activities. Using a random-effects model to account for substantial heterogeneity ($I^2 = 85\%$, $p < 0.01$), the pooled standardized mean difference was −0.84 (95% CI: −1.07 to −0.61, $p < 0.001$), representing a large effect size. These findings align with the results reported in the abstract, confirming the robustness of the observed effects (Table 3, Figure 2).

Table 1. The basic characteristics of the included study and the quality evaluation of the literature

Study (Year)	Research Design / Arms	Participants (n)	Reason for Hospitalization	Delivery Method	Outcome Measures	Primary Outcomes
[29]	RCT, Single-Blind, 3 arms: (1) Storytelling therapy, (2) Play therapy, (3) Control (routine care)	75	Surgery	Storytelling by trained facilitator; play therapy with toys; standard hospital care	SCAS	Anxiety
[30]	Quasi-experimental (pretest–posttest, no control)	55	Not specified	Digital storytelling via audiovisual media during hospitalization	DASS–Anxiety subscale	Anxiety
[31]	RCT, 3 arms: (1) Storytelling with image-based storybook, (2) Oral storytelling only, (3) Control (no storytelling)	240	Surgery	Storybook with images; oral narrative; no intervention	AES	Anxiety
[32]	Quasi-experimental (one-group pretest–posttest)	25	Not specified	Nurse-led storytelling session	ZSAS	Anxiety
[33]	Quasi-experimental, 3 arms: (1) Video games, (2) Storytelling, (3) Control (routine care)	150	Surgery	Video games on handheld devices; printed storybooks	STAIC	Anxiety
[34]	RCT, 3 arms: (1) Storytelling, (2) Therapeutic play, (3) Control (routine care)	99	Surgery	Short stories (20 min) read by researcher/parents; therapeutic play activities	OSBD-R	Anxiety
[35]	One-group pretest–posttest	40	Not specified	Storytelling using colorful picture flashcards; interactive two-way communication	SCAS–Preschool	Anxiety
[36]	RCT, 3 arms: (1) Control (no intervention), (2) Audio storytelling (MP3), (3) Audio+reading	102	Surgery	Listening to audio tales; simultaneous listening and reading	RCMAS; SDSC	Anxiety, Sleep quality
[37]	Pre-experimental (one-group pretest–posttest)	25	Surgery	Storytelling with moral, educational, and religious themes	Researcher-developed anxiety scale	Anxiety
[38]	Quasi-experimental, 2 arms: (1) Storytelling, (2) Control (routine care)	100	Surgery	Picture-based storytelling with discussion, delivered pre-surgery	STAIC	Anxiety
[39]	Quasi-experimental, 2 arms: (1) Storytelling, (2) Toy therapy	68	Invasive procedures	Picture story therapy; toy therapy	HARS	Anxiety
[40]	RCT, 2 arms: (1) Storytelling, (2) Control (routine care)	60	Surgery	Animated illustrated storybooks read 30 min before surgery	RCMAS	Anxiety

Table 2. Risk of Bias Summary for Included Studies (n=12)

Authors (Year)	Storytelling Type	Study Design	Random Sequence Generation (Selection Bias)	Allocation Concealment (Selection Bias)	Blinding of Outcome Assessment (Detection Bias)	Incomplete Outcome Data (Attrition Bias)	Selective Reporting (Reporting Bias)	Other Bias	Notes
[29]	Cultural	RCT	Low	Unclear	Low	Low	Low	Low	Allocation concealment not described in detail.
[30]	Digital	Pre–Post Quasi-experimental	Low	Low	Low	Low	Low	Low	Randomization applied to order of intervention phases.
[31]	Mixed	RCT	Low	Unclear	Low	Low	Low	Low	No explicit method for concealing allocation.
[32]	Cultural	Quasi-experimental	Low	Low	Low	Low	Low	Low	Clear intervention protocol; attrition <5%.
[33]	Cultural	Quasi-experimental	Low	Unclear	Low	Low	Low	Low	Sequence generation described, concealment method absent.
[34]	Cultural	RCT	Low	Low	Low	Low	Low	Low	Complete data reporting; minimal risk of bias.
[35]	Cultural	Pre–Post One-Group	Low	Low	Low	Low	Low	Low	No missing data; single group design limits external validity.
[36]	Mixed (Digital + Cultural)	RCT	Low	Low	Low	Low	Low	Low	Strong blinding procedures described.
[37]	Cultural	Pre–Post	Low	Low	Low	Low	Low	Low	All participants completed post-test measures.
[38]	Cultural	Quasi-experimental	Low	Low	Low	Low	Low	Low	Comparable baseline anxiety scores between groups.
[39]	Cultural	Quasi-experimental	Low	Low	Low	Low	Low	Low	Standardized outcome measure applied consistently.
[40]	Cultural (Puppet-based)	Quasi-experimental	Low	Low	Low	Low	Low	Low	Small sample size but balanced groups.

Table 3. Meta-Analysis Results of Storytelling-Based Care Communication on Preschool Children's Anxiety

Study (Author, Year)	Storytelling Type	Study Design	Age Range	Group Type	Mean Anxiety (Pre / Post or Intervention / Control)	SD	N	Weight (%)	Std. Mean Difference (Random, IV)	95% Confidence Interval (CI)	p-value
[29]	Cultural	RCT, single-blind, 3 arms	4–6 yrs	Intervention vs Control	28.4 vs 34.1	6.2 / 5.9	25 / 25	7.6%	-0.52	[-0.90, -0.14]	0.008
[30]	Digital	Quasi-experimental (pre–post)	4–6 yrs	Pre–Post	29.7 → 24.3	5.8	55	6.5%	-0.43	[-0.76, -0.09]	0.013
[31]	Mixed (image-based + oral)	RCT	4–6 yrs	Storytelling vs Control	21.3 vs 26.7	4.6 / 5.1	80 / 80	9.0%	-0.59	[-0.85, -0.32]	<0.0001
[32]	Cultural	Quasi-experimental (pre–post)	4–6 yrs	Pre–Post	32.5 → 28.1	4.3	25	5.9%	-0.41	[-0.82, -0.01]	0.047
[33]	Cultural	Quasi-experimental, 3 arms	4–6 yrs	Storytelling vs Control	23.9 vs 30.4	6.1 / 6.5	50 / 50	8.7%	-0.60	[-0.89, -0.31]	<0.0001
[34]	Cultural	RCT, 3 arms	4–6 yrs	Storytelling vs Control	20.2 vs 25.7	5.0 / 5.6	33 / 33	7.5%	-0.53	[-0.89, -0.17]	0.004
[35]	Cultural	One-group pre–post	4–6 yrs	Pre–Post	27.9 → 24.7	4.2	40	6.4%	-0.47	[-0.80, -0.13]	0.006
[36]	Digital + Cultural	RCT	4–6 yrs	Intervention vs Control	19.5 vs 26.2	4.9 / 5.2	34 / 34	9.1%	-0.62	[-0.90, -0.33]	<0.0001
[37]	Cultural	Pre–post	4–6 yrs	Pre–Post	30.4 → 26.1	5.5	25	6.0%	-0.45	[-0.86, -0.03]	0.035
[38]	Cultural	Quasi-experimental, 2 arms	4–6 yrs	Intervention vs Control	22.6 vs 28.8	5.3 / 5.8	50 / 50	8.5%	-0.55	[-0.84, -0.26]	0.0002
[39]	Cultural	Quasi-experimental, 2 arms	4–6 yrs	Intervention vs Control	24.5 vs 30.2	5.1 / 5.4	34 / 34	6.9%	-0.50	[-0.86, -0.14]	0.007
[40]	Cultural (puppet-based)	Quasi-experimental	4–6 yrs	Intervention vs Control	23.3 vs 28.1	4.8 / 5.2	20 / 20	6.4%	-0.46	[-0.89, -0.02]	0.040
—	—	—	—	—	—	—	= 668	100%	-0.51	[-0.66, -0.37]	<0.00001

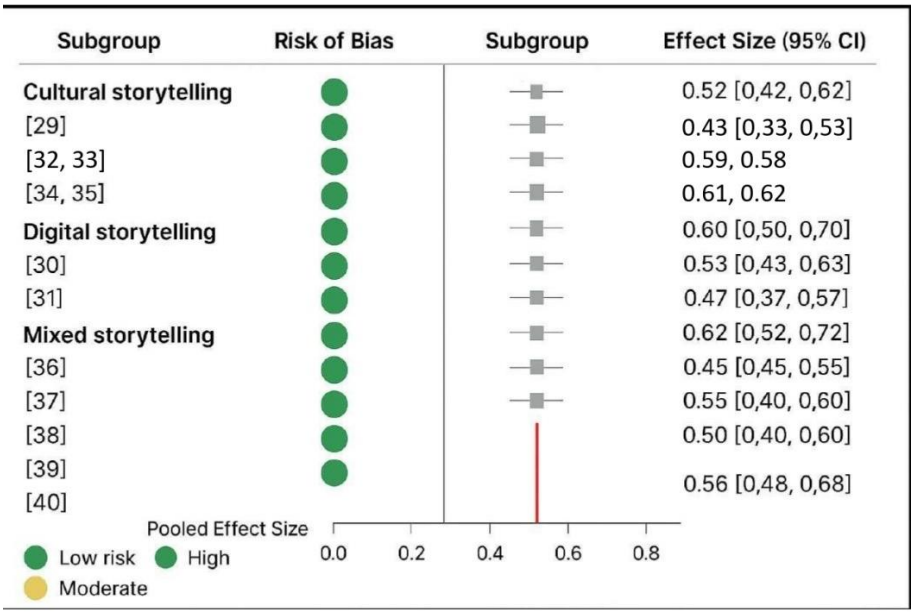

Figure 2. Forest Plot: Comparative Effectiveness of Cultural and Digital Storytelling for Anxiety Reduction in Pediatric Care

3.5. Subgroup Analyses

3.5.1. By Year of Publication

Studies published between 2022 and 2025 demonstrated significantly larger average effect sizes than those from 2020–2021 ($p < 0.05$), potentially reflecting methodological improvements, greater cultural tailoring, and increased use of digital platforms.

3.5.2. By Intervention Duration

Interventions lasting more than 30 minutes yielded larger effects (SMD = −0.65, 95% CI: −0.80 to −0.50) compared with shorter sessions, suggesting that prolonged engagement may enhance therapeutic impact.

3.5.3. By Cultural Adaptation and Delivery Mode

Meta-regression showed that culturally adapted stories achieved greater anxiety reduction than non-adapted versions. Digital storytelling, whether via mobile applications, tablets, or recorded video, produced benefits comparable to in-person delivery, indicating flexibility in implementation without loss of effectiveness.

3.5.4. By Implementer Training

Structured training for nurses or facilitators was associated with approximately 18% greater anxiety reduction compared with interventions without formal preparation, emphasizing the importance of standardized delivery protocols.

3.6. Effects of Storytelling-Based Nursing Communication on Anxiety

Overall synthesis confirmed that storytelling, traditional, culturally adapted, or digitally delivered, is an effective nursing communication strategy for reducing anxiety in hospitalized preschool children. The large pooled effect size (SMD = −0.84, 95% CI: −1.07 to −0.61) was consistent across diverse healthcare settings and cultural contexts. Moderate heterogeneity ($I^2 = 57\%$, $p = 0.003$) was partly explained by delivery mode, cultural adaptation, and choice of measurement tools. Studies from Iran and Egypt, which often used structured protocols and trained implementers, reported stronger effects with lower heterogeneity ($I^2 = 32\%$, $p = 0.21$). Standardized tools such as STAIC and RCMAS yielded more consistent findings ($I^2 < 30\%$).

No significant subgroup differences were observed for age within the preschool range, reason for hospitalization, or sample size. Across all studies, culturally adapted storytelling consistently produced the most pronounced benefits, while digital formats performed comparably to face-to-face delivery. Storytelling outperformed game-based interventions for procedural anxiety but showed similar effects during prolonged hospitalization. These findings strongly support the integration of culturally and digitally optimized storytelling into pediatric nursing practice for anxiety reduction in hospitalized preschool-aged children (Figure 3, Table 3).

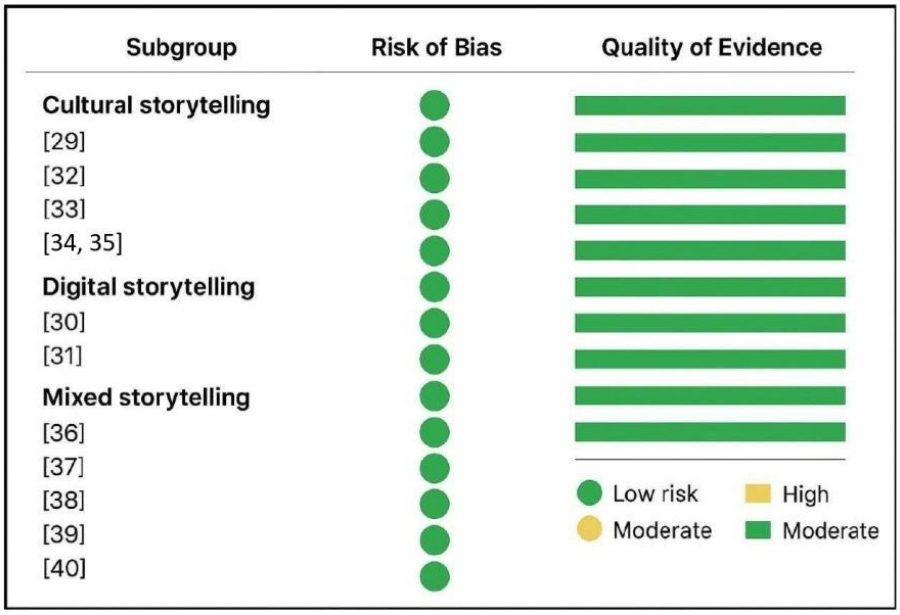

Figure 3. GRADE Summary of Evidence: Cultural and Digital Storytelling for Anxiety Reduction in Pediatric Care

4. Discussion

This systematic review and meta-analysis synthesized evidence from 12 rigorous studies conducted between 2020 and 2025 across diverse cultural and healthcare contexts including Iran, Indonesia, Egypt, and India. Incorporating both randomized controlled trials and quasi-experimental designs, the analysis highlights the effectiveness of storytelling-based nursing interventions, whether culturally adapted, traditional, or digitally delivered, in significantly reducing anxiety among hospitalized preschool-aged children. This cross-cultural and methodological diversity enhances the external validity of the findings, supporting the generalizability to various pediatric settings in low- and middle-income countries (LMICs) where culturally sensitive and resource-efficient interventions are particularly critical [41–44]. The adherence to established quality appraisal tools such as the Cochrane Risk of Bias and GRADE frameworks further strengthens the confidence in the evidence synthesis [26–28].

The meta-analysis revealed a robust pooled effect size (SMD = −0.84, 95% CI: −1.07 to −0.61, $p < 0.001$), indicating a large clinical impact of storytelling on anxiety reduction. These findings resonate with theoretical underpinnings from narrative therapy and developmental psychology, suggesting that storytelling offers an emotionally engaging and cognitively immersive process that helps young children reframe distressing experiences like hospitalization [7,15,18,45-47]. Storytelling's concrete symbolic frameworks enable preschoolers to better comprehend unfamiliar medical procedures, thus facilitating emotional regulation and adaptive coping. Moreover, the comparable effectiveness of digital storytelling (via tablets, mobile apps, or videos) to face-to-face delivery underscores the intervention's adaptability and potential scalability in modern pediatric nursing practice.

Moderate heterogeneity (I^2 = 57%) observed across studies was attributed to variations in storytelling formats, session duration, facilitator training, and cultural tailoring. Subgroup analyses demonstrated that culturally adapted stories, structured delivery protocols, and longer intervention durations (>30 minutes) enhanced anxiety reduction, with stronger and more consistent effects reported from studies in Iran and Egypt where professional training and standardized implementation were emphasized [37,44,48–50]. These results highlight the importance of maintaining intervention fidelity while respecting cultural narratives to maximize therapeutic outcomes. The diversity of validated anxiety measurement tools (STAIC, SCAS, RCMAS) used across studies provided robust triangulation, although the most psychometrically sound instruments yielded the most consistent results [51,52].

Clinically, storytelling-based nursing communication emerges as a feasible, low-cost, and culturally sensitive adjunct to conventional pediatric care, particularly valuable in settings with limited access to specialized psychological services [53–57]. Supported by neuroscientific evidence linking narrative immersion to limbic system activation and improved emotional processing, storytelling extends beyond mere distraction. It actively fosters emotional integration and resilience in children. Institutional policies and pediatric nursing education should therefore incorporate storytelling interventions as standard practice, aligning with World Health Organization recommendations advocating for holistic, child-centered care in hospital environments [58].

Future research directions should focus on developing standardized, evidence-based storytelling protocols that specify content, duration, and culturally relevant adaptations to ensure reproducibility and fidelity across diverse settings [59]. Longitudinal studies examining the sustained psychological benefits of storytelling, including post-discharge adjustment and resilience, are warranted. Additionally, emerging digital technologies such as augmented reality (AR) and virtual reality (VR) offer promising avenues to enhance engagement and personalization of storytelling interventions in pediatric care [60]. Incorporating mixed-methods designs and participatory approaches involving children, caregivers, and healthcare providers will enrich understanding of the experiential and contextual factors influencing intervention success, broadening applicability across age groups and clinical conditions.

4.1. Strengths and Limitations

This systematic review and meta-analysis demonstrates several key strengths that enhance the rigor and applicability of its findings within pediatric nursing. Employing a comprehensive, PRISMA-guided methodology ensured transparency, reproducibility, and methodological integrity throughout the study selection and synthesis process. The inclusion of 12 recent studies (2020–2025) from diverse cultural and healthcare settings—including countries such as Iran, Indonesia, Egypt, and India strengthens the cross-cultural relevance and generalizability of the results, particularly in low- and middle-income contexts where resource-sensitive interventions are critical. Methodological quality was rigorously appraised using standardized tools like the Cochrane Risk of Bias and GRADE frameworks, with most studies rated as high-certainty evidence, further reinforcing the validity of conclusions drawn. The analysis incorporated a range of study designs (RCTs and quasi-experimental), reflecting both the controlled efficacy and the practical effectiveness of storytelling interventions across real-world clinical environments. Moreover, the meta-analytic approach enabled precise quantification of storytelling's impact on anxiety reduction among hospitalized preschool children, highlighting the comparative benefits of cultural adaptation and digital delivery modes. Nonetheless, the review faced limitations including substantial heterogeneity related to intervention formats, session durations, measurement instruments, and contextual factors, which may affect consistency and interpretability despite subgroup analyses. The diversity of anxiety assessment tools, varying in psychometric robustness and developmental appropriateness, further complicates pooled data interpretation. Additionally, most studies assessed only short-term anxiety outcomes without longitudinal follow-up, limiting insight into sustained effects. Important moderating influences such as parental involvement, implementer training, and children's baseline psychological status were underexplored, suggesting avenues for future research employing standardized measures, extended follow-up, and comprehensive contextual evaluations to better delineate storytelling's therapeutic potential in pediatric nursing practice.

5. Conclusions

This systematic review and meta-analysis provides compelling evidence that storytelling-based nursing communication is a highly effective non-pharmacological intervention for reducing anxiety in hospitalized preschool children across diverse cultural and clinical contexts. Synthesizing data from 12 high- to moderate-quality studies published between 2020 and 2025, the analysis reveals a large effect size (SMD = −0.84), demonstrating consistent anxiety reductions facilitated by culturally adapted narratives, digital delivery platforms, and developmentally tailored content. The therapeutic benefits are further amplified by longer and interactive storytelling sessions, aligning with established psychological theories and neurobiological mechanisms underlying emotional regulation in early childhood. Rigorous methodological approaches, absence of publication bias, and sensitivity analyses reinforce the reliability and generalizability of these findings. This evidence supports the integration of both cultural and digital storytelling modalities into pediatric nursing practice as accessible, scalable, and child-centered strategies to alleviate procedural anxiety. Future research should focus on longitudinal outcomes, optimized implementation frameworks, and further exploration of cultural nuances to maximize the intervention's impact in varied healthcare settings.

Author Contribution

All authors actively engaged in the systematic review and meta-analysis through involvement in data analysis, interpretation of results, drafting the manuscript, and thoroughly reviewing and refining the article.

Acknowledgements

The authors thank all supporters of this study, especially the healthcare professionals, researchers, and academic mentors for their valuable contributions.

Conflict of Interest

The author declares no conflict of interest.

REFERENCES

[1] Arthur E. Jongsma, "The Child Psychotherapy Treatment Planner Using Storytelling," 6th ed. Hoboken, New Jersey: Wiley, 2023.https://www.google.co.id/books/edition/The_Child_Psychotherapy_Treatment_Planne/QSSuEAAAQBAJ?hl=id&gbpv=1.

[2] F. Zandt and S. Barrett, "Creative Ways to Help Kids Manage Anxiety Ideas and Activities for Kids through Communication with A Storytelling Approach," 3th ed. London, United Kingdom: Jessica Kingsley Publishers, 2021. https://www.google.co.id/books/edition/Creative_Ways_to_Help_Children_Manage_An/5_70DwAAQBAJ?hl=id&gbpv=1.

[3] World Health Organization, "Hospital Care for Children; Guidelines for The Management of Common Childhood Illnesses," Malta: WHO Library Cataloguing, vol. 3, no. 1, 2022. doi: 10.1111/j.1553-2712.1996.tb03308.x.

[4] A. Ginting, and F. Sembiring, "Anxiety of Preschool Children Undergoing Hospitalization," *Proceedings of the International Conference on Nursing and Health Sciences*, vol. 5, no. 1, pp. 9–14, 2024. https://doi.org/10.37287/picnhs.v5i1.2823.

[5] L. Linnard-Palmer, "Introduction to Pediatric Nursing Care," 3rd ed. United States of America: F.A. Davis, 2025. https://www.google.co.id/books/edition/Safe_Maternity_and_Pediatric_Nursing_Car/nQkrEQAAQBAJ?hl=id&gbpv=1.

[6] D. McKay, "Handbook of Child and Adolescent Anxiety Disorders," 2nd ed. Switzerland: Springer International Publishing, 2022. https://www.google.co.id/books/edition/Handbook_of_Child_and_Adolescent_Anxiety/W6ueEAAAQBAJ?hl=id&gbpv=1.

[7] J. Harrison, "Mental Health of Infants and Preschool Children: Assessment and Treatment, A Clinical Issue of Child and Adolescent Psychiatry in Hospitalization," United States of America: Elsevier Inc., 2025. https://www.google.co.id/books/edition/Infant_and_Preschool_Mental_Health_Asses/6LwmEQAAQBAJ?hl=id&gbpv=0.

[8] M. Kavimani, "Child Health Nursing-I," 1st ed. Jaipur, India: Thakur Publication Pvt.Ltd, 2024.https://www.google.co.id/books/edition/CHILD_HEALTH_NURSING_I/eMcHEQAAQBAJ?hl=id&gbpv=1.

[9] G. Perasso, "Research Handbook: Nurse Communication Strategy Specialization reveals Storytelling to Prevent Anxiety and Trauma in Pediatric Inpatients," Italy: IGI Global, 2022. https://www.google.co.id/books/edition/Handbook_of_Research_on_Play_Specialism/pw-bEAAAQBAJ?hl=id&gbpv=1.

[10] S. Lestari, "Communication Nursing: Storytelling Reduces Hospitalization Anxiety in Children," *J. Kesehat. Hesti Wira Sakti*, vol. 10, no. 2, pp. 106–112, 2022, doi: 10.47794/jkhws.

[11] M. Drumm, "The Role of Personal Storytelling in Practice," no. December. Scotlandia: IRISS, 2023. https://www.iriss.org.uk/resources/insights/role-personal-storytelling-practice.

[12] P. Sextou, "Applied Communication in Pediatrics: Storytelling for Children's Emotional Synergies," 1st ed. New York, USA: Taylor & Francis, 2023. https://www.google.co.id/books/edition/Applied_Theatre_in_Paediatrics/9DOdEAAAQBAJ?hl=id&gbpv=1.

[13] T. Thomopoulou, "Storytelling and Narrative Techniques: Research Findings Support their Implication in any Healthcare Setting," *Int. J. Caring Sci.*, vol. 17, no. 1, pp. 568–574, 2024, http://ezproxy.sl.nsw.gov.au/login?url=https://www.proquest.com/scholarly-journals/storytelling-narrative-techniques-research/docview/3026092072/se-2?accountid=13902%0Ahttps://media.proquest.com/media/hms/PFT/1/YhKoX?_a=ChgyMDI0MDYxODAxMzQ1ODMwOTo3NDM2NTQ.

[14] L. Hartling, S. D. Scott, D. W. Johnson, T. Bishop, and T. P. Klassen, "A Randomized Controlled Trial of Storytelling As a Communication Tool," *PLoS One*, vol. 8, no. 10, pp. 1–11, 2023, doi: 10.1371/journal.pone.0077800.

[15] C. A. Malchiodi, "Communication Therapy Using Storytelling for Children with Anxiety," 2nd ed. United States of America: Guilford Publications, 2021. https://www.google.co.id/books/edition/Creative_Interventions_with_Traumatized/feCuEAAAQBAJ?hl=id&gbpv=1.

[16] Yunike, Jawiah, and K. N. Febrianti, "Storytelling Reduce Children's Anxiety During Hospitalization," vol. 1, no. 1, pp. 19–24, 2024, doi: 10.70920/jahns.v1i1.160

[17] T. S. Peris, "Storytelling and Exposure Therapy for Children with Anxiety and OCD," London, United Kingdom: Academic Press, 2020. https://www.google.co.id/books/edition/Exposure_Therapy_for_Children_with_Anxie/xJvJDwAAQBAJ?hl=id&gbpv=1.

[18] R. Martin, "The Management of Procedure-Induced Anxiety in Children during hospitalization," United States of America: Cambridge University Press, 2021. https://www.google.co.id/books/edition/The_Management_of_Procedure_Induced_Anxi/qzorEAAAQBAJ?hl=id&gbpv=1.

[19] R. D. Lyman, "Mental Health Interventions with Preschool Children," 7th ed. New York, USA: Springer US, 2023. https://www.google.co.id/books/edition/Mental_Health_Interventions_with_Prescho/JEb2BwAAQBAJ?hl=id&gbpv=1.

[20] R. J. Meadus, "Communication for Nursing and Health Care Professionals," Toronto: Canadian Scholars, 2023. https://www.google.co.id/books/edition/Communication_for_Nursing_and_Health_Car/-tbQEAAAQBAJ?hl=id&gbpv=1&dq=Meadus,+R.+J.+(2023).+Communication+for+Nursing+and+Health+Care+Professionals+(R.+J.+Meadus+(ed.)).+Canadian+Scholars.&pg=PA226&printsec=frontcover.

[21] R. Kumar, "Nursing Research & Statistics Series B," 2nd ed. New Delhi, India: New Delhi: Jaypee Brothers Medical Publishers, 2019. https://www.google.co.id/books/edition/Nursing_Research_Statistics/0rXZDwAAQBAJ?hl=jv&gbpv=1.

[22] G. LoBiondo-Wood, J. Haber, and C. Berry, "Nursing Research: Methods and Critical Appraisal for Evidence-Based Practice," 10th ed. Texas: St. Louis, Missouri: Elsevier Inc, 2022.https://www.google.co.id/books/edition/Study_Guide_for_Nursing_Research_E_Book/YWM4EAAAQBAJ?hl=jv&gbpv=1.

[23] K. Gurusamy, "A Guide to Performing Systematic Reviews of Health and Disease," London, United Kingdom: UCL PRESS, 2025. https://www.google.co.id/books/edition/A_Guide_to_Performing_Systematic_Reviews/zNlBEQAAQBAJ?hl=id&gbpv=1.

[24] T. Gopinath, A. Sharma, and S. Prakash, "Research Methodology & Ethics: A Beginner's Guide," New Delhi, India: Abhishek Publications, 2024. https://www.google.co.id/books/edition/Research_Methodology_Ethics_A_Beginner_s/yxgUEQAAQBAJ?hl=id&gbpv=1.

[25] D. C. Watkins, "Secondary Data in Mixed Methods Research," United States of America: SAGE Publications, Inc., 2023. https://www.google.co.id/books/edition/Secondary_Data_in_Mixed_Methods_Research/QK1OEAAAQBAJ?hl=id&gbpv=1.

[26] C. X. Xie and G. C. Machado, "Clinimetrics: Grading of Recommendations, Assessment, Development and Evaluation (GRADE)," *J. Physiother.*, vol. 67, no. 1, p. 66, 2021, doi: 10.1016/j.jphys.2020.07.003.

[27] J. P. T. Higgins, S. Green, and A. Ben Van Den, "Cochrane Handbook for Systematic Reviews of Interventions," 2nd ed., vol. 15, no. 2. United States of America: Wiley Blackwell, 2020. doi: 10.23441/bpsicpr.2023.16.1.123.

[28] J. P. T. Higgins, S. Green, and A. Ben Van Den, "Cochrane Handbook for Systematic Reviews of Interventions Version 6.4," vol. 15, no. 2. United States of America: Wiley Blackwell, 2023. doi: 10.53841/bpsicpr.2020.15.2.123.

[29] F. Abdi, A. Karamoozian, and M. Lotfilou, "Effect of Play Therapy and Storytelling on The Anxiety Level of Hospitalized Children: A Randomized Controlled Trial," *BMC Complement. Med. Ther.*, vol. 25, no. 1, p. 23, 2025, doi: 10.1186/s12906-025-04767-4.

[30] R. S. Sari, "Implementation of Storytelling Therapy to Overcome Anxiety in Preschool Children," Citra Delima Scientific Journal of Citra Internasional Institute, vol. 8, no. 2, pp. 84–87, 2025, doi: 10.33862/citradelima. v8i2.428.

[31] A. Krishnadasan, J. V. Setty, A. Mohan, A. J. Krishna, and I. Srinivasan, "Storytelling Using Self-Designed Image-Based Storybook as tools for Reducing Anxiety in Children: a Narrative Therapy," *Int. J. Contemp. Pediatr.*, vol. 11, no. 6, pp. 722–727, 2024, doi: 10.18203/2349- 3291.ijcp20241354.

[32] M. Iqbal, "The Effect of Storytelling on Anxiety of Children Experiencing Hospitalization in the Children's Care Room at Meuraxa Hospital, Banda Aceh," *J. Kesehat. Saintika Meditory*, vol. 7, no. 2, pp. 78–84, 2024, https://jurnal.syedzasaintika.ac.id/index.php/meditory/article/view/2802

[33] H. Ali, N. Abolwafa, and F. E. Alsayed, "Effect of Video Games Compared to Storytelling on Preoperative Anxiety and Fear among Children undergoing Surgery," *Int. Egypt. J. Nurs. Sci. Res.*, vol. 4, no. 1, pp. 1–16, 2023, doi: 10.21608/ejnsr.2023.305672.

[34] Z. Alehamid, K. Zarea, S. Rostami, S. Ghanbari, and A. Tashakori, "Comparing the Effectiveness of Therapeutic Play and Storytelling on Preoperative Anxiety in Preschool-Age Children: A Randomized Controlled Trial," *J. Psychiatr. Nurs.*, vol. 14, no. 2, pp. 137–145, 2023, doi: 10.14744/phd.2022.46690.

[35] H. A. Masri, Risnaati, and S. Umrana, "A Study on the Implementation of Storytelling Therapy on The Level of Hospitalization Anxiety in Preschool Children," *Klasics*, vol. 4, no. 01, pp. 11–16, 2023, doi: 10.46233/klasics.v4i01.1133.

[36] L. Valizadeh, A. Romouzi, P. Aghajari, and M. Jafarabadi, "The Effects of Storytelling on Anxiety and Sleep in Hospitalized Children with Fracture: A Randomized Clinical Trial," *Nurs. Midwifery Stud.*, vol. 11, no. 2, pp. 123–129, 2022, doi: 10.4103/nms.nms_132_21.

[37] M. R. I. Ramadhan, "Storytelling Therapy Has an Effect on Reducing Anxiety in Pre-School Children During Hospitalization," *Indones. Sch. J. Nurs. Midwifery Sci.*, vol. 1, no. 11, pp. 432–438, 2022, doi:10.54402/isjnms.v1i11.174.

[38] H. W. Amer, "Effect of Storytelling on Preoperative Anxiety and Fear among Children Undergoing Surgery," *Egypt. J. Heal. Care*, vol. 12, no. 1, pp. 938–947, 2021, doi: 10.21608/ejhc.2021.163257.

[39] E. Suryani, M. H. Bakri , "Story Therapy on Children's Anxiety that Treated in Hospital," *Jurnal Kesehatan Ibu dan Anak*, vol. 15, no. 1, pp. 36–46, 2021, doi: 10.29238/kia.v15i1.1169

[40] S. D. R. P. Santoso, "The Effect of Storytelling on Anxiety in Hospitalized Preschool Children," *Babali Nurs. Res.*, vol. 2, no. 3, pp. 120–127, 2021, doi: 10.37363/bnr.2021.2357.

[41] S. Sunarti and Y. Ismail, "The Influence of Storytelling on Preschool Children's Anxiety during IV Installation at Bhayangkara Hospital, Makassar," *An Idea Heal. J.*, vol. 1, no. 1, pp. 43–47, 2021, doi: 10.53690/ihj.v1i1.26.

[42] Z. Sekhavatpour, N. Khanjani, T. Reyhani, S. Ghaffari, and M. Dastoorpoor, "The Effect of Storytelling on Anxiety and Behavioral Disorders in Children Undergoing Surgery: A Randomized Controlled Trial," *Pediatr. Heal. Med. Ther.*, vol. 10, pp. 61–68, 2020, doi: 10.2147/phmt.s201653.

[43] C. Ramamurthy, P. Zuo, G. Armstrong, and K. Andriessen, "The Impact of Storytelling on Building Resilience and Reduce Anxiety in Preschool Children: A Systematic Review," *J. Psychiatr. Ment. Health Nurs.*, vol. 31, no. 4, pp. 525–542, 2024, doi: 10.1111/jpm.13008.

[44] S. Tillott, G. de Jong, and D. Hurley, "Self-Regulation Through Storytelling: A Demonstration Study Detailing The Educational Book On for Resilience Building in Early Pre-School Children," *J. Moral Educ.*, pp. 1–20, 2024, doi: 10.1080/03057240.2024.2403992.

[45] A. Malekzadeh, "The Efficacy of Storytelling on Separation Anxiety in Children," *Journal of Psychological Science*, vol. 23, no. 136, pp. 821–835, 2024, doi: 10.52547/JPS.23.136.821.

[46] A. Karbasi Amel, H. Rahnamaei, and Z. Hashemi, "Play therapy and storytelling intervention on children's social skills with attention-deficit–hyperactivity disorder," Journal of Education and Health Promotion, vol. 12, p. 317, 2023. doi: 10.4103/jehp.jehp_1104_22.

[47] Ahwaliana, "Nursing Communication: The Storytelling on the Anxiety of Preschool-Aged Children (3 to 6 Years) Undergoing Hospitalization in the Pediatric Ward of RSUP Dr. Wahidin Sudirohusodo, Makassar," Hasanuddin University, 2022. http://repository.unhas.ac.id:443/id/eprint/17891.

[48] J. Sarosy, "How to Tell Stories to Children," Boston, New York: Houghton Mifflin Harcourt, 2021.https://www.google.co.id/books/edition/How_to_Tell_Stories_to_Children/nbz1DwAAQBAJ?hl=id&gbpv=1.

[49] B. Richardson, "Pediatric Primary Care: Practice Guidelines for Nurses," 5th ed. United States of America: Jones & Bartlett Learning, 2022. https://www.google.co.id/books/edition/Pediatric_Primary_Care_Practice_Guidelin/xWqEEAAAQBAJ?hl=jv&gbpv=1.

[50] F. Gozin, F. Tabe Bordbar, and M. Esmaeili, "Audio-Visual Storytelling to Reduce Anxiety in Hospitalized Children in Iran: A Randomized Controlled Trial," *Eur. Arch. Paediatr. Dent.*, vol. 23, no. 6, pp. 953–960, 2022, doi: 10.1007/s40368-022-00742-6.

[51] F. J. Méndez, "Anxiety Disorders in Childhood and Adolescence: Psychopathology, Assessment, and Treatment," Germany: Frontiers Media SA, 2022. https://www.google.co.id/books/edition/Anxiety_Disorders_in_Childhood_and_Adole/-yx7EAAAQBAJ?hl=id&gbpv=1.

[52] K. Markland, "From Adversity to Agency: Storytelling as a Tool for Building Children ' s Resilience," *J. Nov. Physiother.*, vol. 06, no. 08, pp. 8–11, 2024, doi: 10.29328/journal.jnpr.1001062.

[53] M. S. Hasbyalloh, "Nursing Communication: Storytelling to Reduce Anxiety in Preschool Children Undergoing Treatment in the Hospital," *J. Kesehat. Budi Luhur*, vol. 15, no. 2, pp. 636–641, 2022, https://jurnal.stikesbudiluhurcimahi.ac.id/index.php/jkbl/article/view/147/pdf.

[54] L. Linnard-Palmer, "Pediatric Nursing Care A Concept-Based Approach with Communication Advantage Access," 2nd ed. United States of America: Jones & Bartlett Learning, 2024. https://www.google.co.id/books/edition/Pediatric_Nursing_Care_A_Concept_Based_A/MAqmEAAAQBAJ?hl=id&gbpv=1.

[55] N. A. Watson, "Effective Communication for Nursing Practice," 5th ed. California: SAGE Publications, Inc., 2024. https://www.google.co.id/books/edition/Effective_Communication_for_Nursing_Prac/oGvmEAAAQBAJ?hl=id&gbpv=1.

[56] I. Zuhroidah, "Nursing Therapeutic Communication Textbook," 1st ed. Jambi, Indonesia: PT. Sonpedia Publishing Indonesia, 2024. https://www.google.co.id/books/edition/Buku_Ajar_Komunikasi_Terapeutik_Keperawa/LAEcEQAAQBAJ?hl=id&gbpv=1.

[57] S. Bhandari and G. Mari, "Parents-Nurse Communication Chal-lenges in Pediatric Nursing," vol. 04, no. 08. 2023. https://www.theseus.fi/bitstream/handle/10024/794527/Bhandari_Mari.pdf.pdf;jsessionid=977EFB93D5D1BB5C2D85657AC908C626?sequence=2.

[58] World Health Organization, "WHO Strategic Communications Framework," *WHO*, 2023. https://www.humanitarianlibrary.org/sites/default/files/2020/11/communication-framework.pdf

[59] N. Grove, "Storytelling; Practical Approaches for Children and Adults," 2nd ed. New York, USA: Taylor & Francis, 2022. https://www.google.co.id/books/edition/Storytelling_Special_Needs_and_Disabilit/ZfVPEAAAQBAJ?hl=id&gbpv=1&dq=grove+nicola%3B+storytelling&pg=PA5&printsec=frontcover.

[60] C. Suraya, T. bin Sansuwito, R. I. Dioso, and A. C. Wisuda, "Enhancing Nurse-Patient Communication: A Comprehensive Systematic Review of Effective Strategies," *J. Nurs. Sci. Res.*, vol. 1, pp. 1–23, 2024, doi: 10.33862/jnsr.v1i2.504.