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Research Design and Procedures: Mix method on Technology-Based Atraumatic Care for Hospitalized Children

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Abstract

Introduction : Atraumatic care is a therapeutic service to minimize trauma caused by both psychological and psychological impacts due to the impact of treatment in hospitals, nursing homes or carrying out treatment at home. Mixed methods research is particularly effective for studying complex healthcare interventions, as it combines the strengths of both qualitative and quantitative approaches.

Methods:Literature searches are used in this method. The researcher conducted a search using electronic databases as follows Google Scholar, PubMed, Scopus , DOAJ. The author conducted a search using keywords or terminology including "Paediatric Care", "technology-based atraumatic care", 'hospitalized children", "Mix Method Research Design" , "pediatric care". In the process of searching for journal articles, the author conducted a search based on inclusion criteria consisting of: 1. The mix methods research design, 2. Atraumatic care in sick children, 3. Hospitalized sick children, 4. Journal articles and manuscripts. The exclusion criteria in this search are 1. Articles with a year limit of less than 2020; 2. Articles not in English.

Results: In the process of finding journals in search engines, it was found that there were around 821 research journals related to the theme. There is 5 article related mix method on technology based atraumatic care

Conclusion: The mixed-method research design and procedures outlined in this thesis offer a robust framework for evaluating technology-based atraumatic care for hospitalized children By combining quantitative and qualitative approaches, the study aims to provide a nuanced understanding of the intervention's impact, ultimately contributing to improved healthcare outcomes for children

Keywords: mix method, , atraumatic care, hospitalized children, technology

1. INTRODUCTION

Hospitalization can be a stressful experience for children, as they frequently endure suffering and discomfort as a result of medical treatment. Additionally, frequent and/or extended hospitalization can have a detrimental impact on the academic and social activities of children with significant medical conditions, as it requires them to spend extended periods of time at home and removes them from their daily routines at school.(1) Atraumatic care is a therapeutic service to minimize trauma caused by both psychological and psychological impacts due to the impact of treatment in hospitals, nursing homes or carrying out treatment at home As a pediatric nurse, it is important to be especially alert to any situations that can cause distress and to be able to identify potential stressors (2).

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Nursing care is quite important to reduce stressors for children in environments that are exposed to hospital situations and conditions (3). Atraumatic care is provided by health workers, including nurses and doctors, who are trained to prepare children for treatment procedures that can cause pain Utilizing the Pediatric Nurse is training that consists of non-medical preparation for surgery and other medical procedures; support during medical procedures, play therapy, activities to provide support for growth and development, sibling support, advocacy for the family, special interventions in the emergency room, hospital tours before procedures are carried out. Children who experience the effects of hospitalization who are not given good atraumatic care management will have an impact on stress on the child, both physically, psychologically, and trauma for the child, family and also for health workers(4).

Atraumatic care is grounded in the principles of reducing fear, pain, and anxiety among pediatric patients.(5) Technology-based interventions, such as virtual reality (VR), mobile applications, and interactive games, have been increasingly utilized to achieve these goals.. A mixed methods approach allows researchers to explore both the effectiveness of these technologies (quantitative) and the lived experiences of children, parents, and healthcare providers (qualitative) (2)

Mixed methods research is particularly effective for studying complex healthcare interventions, as it combines the strengths of both qualitative and quantitative approaches. Outline several mixed methods designs, including convergent parallel, explanatory sequential, and exploratory sequential designs. In the context of technology-based atraumatic care, the explanatory sequential design is often employed(6). This design involves: Phase 1 (Quantitative): Assessing the effectiveness of a technology-based intervention (e.g., VR distraction therapy) through surveys or experimental designs. Phase 2 (Qualitative): Conducting in-depth interviews or focus group discussions to explain the quantitative findings and explore participants' perspectives.

2. METHODE

Search Strategy

This study used a method with the PRISMA scheme (Preferred, Reporting, Items for Systematic Reviews, and Meta-Analyzes) to describe the search strategy, article feasibility, and included articles that will be analyzed in this research. The search process is shown in the flowchart in Figure 1.

Identify the research question

Researchers prepared research questions using the PICO format, namely Population, Intervention, Comparison, Outcome (PICO). This format is attached in Table 1. The guiding research question in this literature review is " How effective are mixed methods research designs and procedures in studying technology-based atraumatic care for hospitalized children in Yogyakarta, and what are their strengths and limitations compared to single-method approaches?"

Table 1: PICO Format

PICO	Mesh	Database
Population	Studies involving hospitalized children	Pubmed, Scopus , DOAJ, Google Scholar
Intervention	Use of mixed methods research design.	
Comparison	No comparison	
Outcomes	Quality, rigor, and effectiveness of mixed methods research designs and procedures.	

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The author conducted a strategy in identifying references using relevant keywords and terminology that were in accordance with the research questions. In addition, the researcher conducted a search using electronic databases as follows Google Scholar, PubMed and the National Centre for Biotechnology Information, Scopus , DOAJ. The author conducted a search using keywords or terminology including "Paediatric Care", “technology-based atraumatic care”, ‘hospitalized children”, “Mix Method Research Design” , “pediatric care” . In the process of searching for journal articles, the author conducted a search based on inclusion criteria consisting of: 1. The mix methods research design, 2. Atraumatic care in sick children, 3. Hospitalized sick children, 4. Journal articles and manuscripts. The exclusion criteria in this search are 1. Articles with a year limit of less than 2020; 2. Articles not in English. There are articles that were searched in this literature review process. In this study, researchers criticized 821 articles based on search results.

Data Extraction

In data extraction, the author entered it into an electronic spreadsheet so that the data extraction process could be managed well. The data extraction process consists of: (1) Author, (2) year of research, (3) researcher's country of origin, (4) objectives, (5) methods, (6) results.

Table 1 Query Result

Resoues of the article	Query	Number of Article
PubMed	Paediatric Nurse ,OR Atraumatic Care , OR Hospitalized Children	553 article
Scopus	Paediatric Nurse ,AND Atraumatic Care , AND Hospitalized Children	112 article
DOAJ	“atraumatic care” in Children	31 article
Google Scholar	"pediatric nurse" and " atraumatic care" and "children"	125 article

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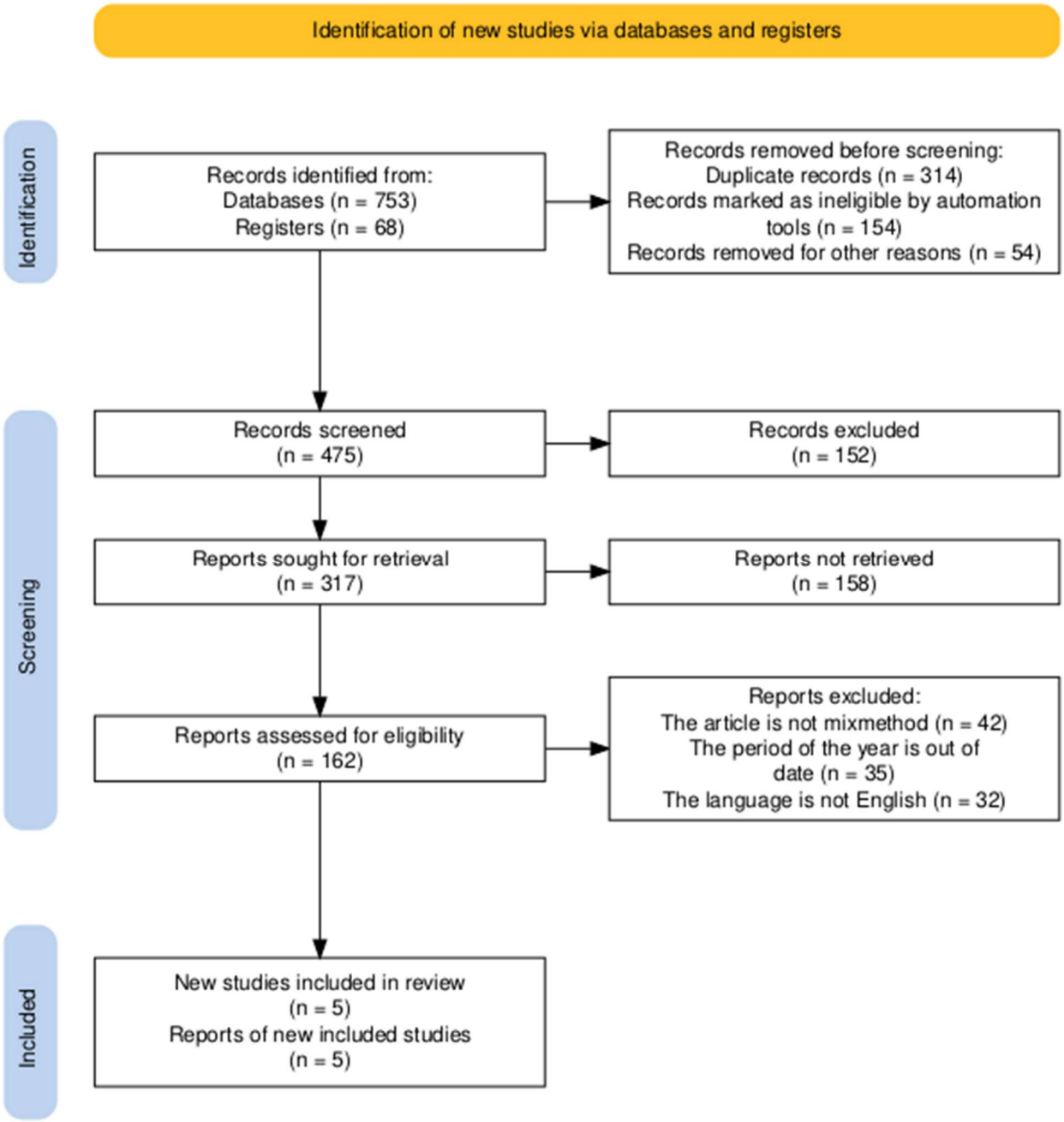

FIGURE 1 . PRISMA Flowchart Technology-Based Atraumatic Care

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3. RESULT AND DISCUSSION

a. Result

In Table 2, the author analyzes the article which includes title, author's name, year, method, objectives and results. There are 5 articles reviewed by the author, including the first article entitled "A web-based educational intervention to implement trauma-informed care in a paediatric healthcare setting: protocol for a feasibility study using pre-post mixed methods design"; the second article entitled " Parents' Preferences for Primary Care-Based Behavioural Services and the COVID-19 Pandemic: A Mixed Method Study", the third article entitled Scalability of an ACT-Based strategy for improving well-being in health care providers: A mix-method and preliminary evaluation of efficacy" , the article The next theme is "Scalability of an ACT-Based strategy for improving well-being in health care providers: A mix-method and preliminary evaluation of efficacy". The fifth article is The My Guide Web-Based Self-Management Tool for Concussion Rehabilitation: Mixed Methods Cross-Sectional Study.

Table 2. Article Review Table

Author	Country	Objective	Method	Result
Simon Megan,et al,2020 A web-based educational intervention to implement trauma-informed care in a paediatric healthcare setting: protocol for a feasibility study using pre-post mixed methods design	Australia	A web-based education intervention (termed Responsive CARE) was developed to build self-efficacy of staff in a paediatric medical setting.	A pre-post, mixed methods design will be employed.	This study will provide insights into factors that impact upon the feasibility of a web-based trauma-informed care education intervention in a clinical practice setting. This knowledge may support other education approaches within healthcare settings related to improving and supporting patients to reduce the risk of healthcare interactions that result in paediatric medical traumatic stress.(7)
Hails, et al 2023, Parents' Preferences for Primary Care-Based Behavioral Services and the COVID-19 Pandemic: A Mixed Method Study	America	This study examined how family factors impacted parents' attitudes	Parents of children ages 1.5–5 years (N ¼ 301) from five primary care clinics completed a	Higher COVID-19 impact was significantly associated with worse parent mental health and child behavior problems, as well as

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		toward integrated behavioral health (IBH) in pediatric primary care during the COVID-19 pandemic.	survey with measures assessing familial contextual factors (income, race and ethnicity, and parents' childhood adversity), A subsample of parents (n ¼ 23) completed qualitative interviews to provide deeper insights into quantitative relationships.	lower interest in IBH virtual support options. Overall, lower SES and racial and/or ethnic minority parents both indicated greater interest in IBH modalities compared to higher SES and White parents, respectively. Qualitative interviews identified how pandemic stressors led to increases in parents' desire for behavioral support from pediatricians, with parents sharing perspectives on the nature of support they desired, including proactive communication from providers and variety and flexibility in the behavioral supports offered (8)

Amanda et al,2022 Scalability of an ACT-Based strategy for improving well-being in health care providers: A mix-method and preliminary evaluation of efficacy	Los Angles, USA	Technology-Mediated Interventions (TMI) seem to be a feasible alternative to increase access to behavioral health resources in this population	The mix-method approach utilized in this stage allowed us to understand in-deep whether the FACE COVID TMI fitted health care professional language, needs, and perspective regarding distress and well-being, as well as its fidelity to the ACT approach. It aimed to produce a context- and user-sensitive intervention.	Scalability Mix-Methods Analyses. Descriptive analysis of health care professional surveys on scalability indicated a general agreement of FACE COVID's ability to connect with their needs and characteristics (M_{Reach} = 3.26; SD_{Reach} = 0.87), as well as being easy to access and engage in the adapted format of the intervention (9)

Danielson,et al, 2024 Development and Usability Testing of an mHealth Tool for Trauma-Informed Prevention of Substance Use, HIV Acquisition, and Risky Sexual Behaviors Among Adolescents: Mixed Methods Study	USA	The goal of this paper is to describe the rationale for and development of the TIPS app and present the results of a mixed methods approach for the initial evaluation of its usability.	Participants included clinicians (n=11), adolescents (n=11), and caregivers (n=10) who completed qualitative interviews and an adapted version of the Website Analysis and Measurement Inventory.	The TIPS app shows promise as an mHealth tool for TF-CBT clinicians to integrate evidence-based substance use, risky sexual behavior, and HIV prevention during treatment. Future research, including a randomized controlled trial comparing (10)

Turcott et al, 2025 ; The My Guide Web-Based Self-Management Tool for Concussion Rehabilitation: Mixed Methods Cross-Sectional Study	Canada	This study aimed to investigate the perceptions and acceptance of clinicians and adults with concussions using MyGuide Concussion (Vancouver Coastal Health), a web-based concussion self-management tool.	Using a mixed methods sequential explanatory design, a convenience sample of 8 adults with concussions and 8 clinicians who used MyGuide Concussion over a 2-year period were interviewed, and their responses were analyzed.	Participants reported two key benefits of using the web-based self-management tool: (1) the tool's emphasis on the interconnectedness of physical and psychological symptoms, and (2) the ability to provide reassurance that symptom being experienced were a normal part of the concussion experience. Clinicians described the tool as being useful as a supplementary source of information for clients in addition to clinical sessions and believed the content was useful for increasing clients' independence in managing their own recovery (11)

b. Discussion

Recent years have seen a major increase in interest in the use of technology in pediatric healthcare, especially in the context of atraumatic care, which aims to reduce the mental and physical suffering of children in hospitals In order to provide a comprehensive perspective, this study uses a mixed-method approach to assess the effectiveness of such treatments, integrating quantitative measurements with qualitative observations.(12)

The mixed-method approach is increasingly acknowledged as a strong framework for healthcare research, as it allows for the triangulation of data and a deeper examination of complicated phenomenaAn explanatory sequential design is used for this study, in which qualitative data is gathered to contextualize and explain the findings after quantitative data is gathered to quantify outcomes Because it allows researchers to evaluate both the quantifiable impact and the subjective experiences of stakeholders, this methodology is especially well-suited for assessing technology-based interventions(13). The usefulness of mixed-method approaches in pediatric healthcare research has been emphasized by recent studies. A study by for instance, showed how integrating surveys and interviews yielded insightful information about the application of virtual reality (VR) for

children's pain management. Likewise, it has been demonstrated that combining quantitative and qualitative data improves the validity and dependability of results in medical contexts .

In Quantitative phase, A purposive sampling strategy is used to recruit hospitalized children, their parents, and healthcare providers . Structured surveys and clinical metrics are used to measure outcomes such as anxiety levels, pain scores, and length of hospital stay. Recent studies have validated the use of digital tools for data collection in pediatric settings (6). Statistical analyses are performed using software such as SPSS or R, with recent advancements in machine learning techniques applied to identify patterns and correlations In qualitative phase the Participant Selection is Key stakeholders, including children, parents, and healthcare providers, are selected for in-depth interviews and focus group discussions . The Data Collection is Semi-structured interviews are conducted to explore participants' experiences and perceptions of the technology-based interventions. The Data Analysis is Thematic analysis is employed to identify recurring themes, with recent methodological advancements in qualitative data analysis software (e.g., NVivo) enhancing the rigor of the process

Qualitative data were analyzed using conventional content analysis. In this process of looking at the data as a whole, then deriving codes from individual responses and categorizing them to identify relationships and interrelationships with one another. Conventional data analysis allows the researcher to avoid imposing preconceived ideas or categories on participants and, instead, to focus on getting information directly from research participants or respondents(14).

Data Triangulation is needed to Quantitative and qualitative findings are integrated to provide a comprehensive understanding of the intervention's impact. Recent studies highlight the importance of triangulation in mixed-method research to enhance the credibility of findings (15) The validation is Member checking and peer review are conducted to ensure the validity and reliability of the results.

4. CONCLUSION

The mixed-method research design and procedures outlined in this thesis offer a robust framework for evaluating technology-based atraumatic care for hospitalized children combining quantitative and qualitative approaches, the study aims to provide a nuanced understanding of the intervention's impact, ultimately contributing to improved healthcare outcomes for children. Mixed methods research is a valuable approach for studying technology-based atraumatic care. Future research should: Focus on developing standardized protocols for mixed methods research in paediatric care. Provide training for researchers on effective data integration techniques. Explore innovative mixed methods designs, such as participatory mixed methods, to involve stakeholders in the research process

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