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Generation, Validation, and Comparative Efficacy of a Modified Betty Neuman–Based Pandemic Care Pathway for Stress Reduction in School-Going Preadolescents

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Abstract

Background & Objectives

The COVID-19 pandemic imposed substantial psychological stress on preadolescents due to disrupted routines, increased academic demands, social isolation, and limited coping capacities. The Betty Neuman Systems Model explains stress responses through lines of defense, its limited emphasis on early prevention necessitates a proactive intervention. This study aimed to develop, validate, and evaluate a modified theory-based intervention, the Stress-Releasing Preadolescent Pandemic Care Pathway (SRPPCP), and to compare its effectiveness with the conventional Betty Neuman–based model.

Methods

An exploratory sequential mixed-methods design was adopted. Phase I involved development and validation of the Tool for Assessing Preadolescents' Pandemic Stress (TAPPS) and formulation of the SRPPCP through expert consultation, content validation, reliability testing, and pilot assessment. Phase II consisted of a randomized controlled trial among 100 school-going preadolescents. Outcomes were assessed at baseline, 7 days, 3 months, and 6 months using standardized psychological and developmental scales. Data were analyzed using SPSS version 26.

Results

The TAPPS tool and SRPPCP demonstrated strong validity and reliability. At six months, the experimental group showed significantly lower perceived stress and superior psychological, behavioral, developmental, and spiritual outcomes compared to the control group ($p < 0.01$). Comparative analysis yielded a chi-square value of 19.85, exceeding the critical value of 6.2467, resulting in rejection of the null hypothesis and confirming over 20% superiority of the SRPPCP.

Interpretation & Conclusions

The modified Betty Neuman–based SRPPCP was more effective in reducing pandemic-related stress and enhancing overall well-being among preadolescents, supporting its adoption as a school-based preventive mental health pathway.

Keywords: Preadolescents, Stress, Pandemic, Care Pathway, Neumann Theory

Introduction

Preadolescence is a very crucial stage of development during which children are rapidly developing in both the body and the brain, gaining the ability to handle emotionalities and their social identities. It typically starts at 9 to 12 that is the transition between early childhood and adolescence. Kids during the time are more vulnerable to internal and external stress. Early puberty, escalating demands in school, peer influences, and family requirements elevate the chances of psychological distress and emotional controls (Sawyer et al., 2018). This is because preadolescents are particularly susceptible to stress because, unlike older adolescents, they usually do not have mature coping skills and the ability to bend

thinking. Globally, mental disorders contribute to approximately 13 percent of disease burden among those under the age of eighteen years. Its most common causes are anxiety, depression and stress-related disorders (World Health Organization [WHO], 2023). The situation is more severe in India due to the high student population in schools, academic competitiveness, the lack of mental health services, and the ongoing stigma regarding the state of psychological health (Patel et al., 2022).

The psychosocial world of children changed drastically due to COVID-19 pandemic. Daily life was interrupted by school closures, abrupt online learning, lack of outdoor activity, loss of peer interaction and contact, and fear, misinformation, and stress in the family. According to the studies conducted in India, the preadolescents experience a greater level of stress, anxiety, irritability, sleep disorders and behavioral problems during and after lockdowns (Singh et al., 2021; Sahoo et al., 2023). The middle-childhood children were the most affected by loss of routines, academic uncertainty and lack of school support since children need outside assistance to manage emotions. Additional family stress was an economic insecurity and unemployment among many families, illness or death, and many reasons (Chandran and Chandrasekaran, 2022). These prolonged stressors caused a crisis that was not limited to infections, but before long mental and emotional health of preadolescents was seriously affected.

Even though this was such an enormous influence, pandemic responses in India and around the world in existing strategies prioritized the Biomedical containment, infection control, vaccination and disease treatment. These actions were essential, but they did not pay a lot of attention to the psychosocial aspect of being exposed to the pandemic, particularly in children. Most of the available mental health services were reactive and fragmented and symptom-focused rather than preventive and resilience-building (Ransing et al., 2020). Mental health programs implemented in schools were discontinued or redesigned to be used online, which created a huge deficit of early stress detection and prevention. The gap demonstrates an immediate necessity of organized, theoretically supported, evidence-based care schemes that address the issue of psychological stress in its early stages, particularly among vulnerable populations, such as school-going preadolescents.

Betty Neuman Systems Model is a solid theoretical framework allowing to consider people as open systems that interact constantly with the internal and external stressors. Neuman also defines three types of stressors, intrapersonal, interpersonal and extraperonal, and is of the opinion that stability of the system depends on defensive and resistance lines which protect the main construction (Neuman and Fawcett, 2011). The model highlights primary, secondary and tertiary prevention as some of the main nursing interventions to be adopted in the process of balance maintenance or restoration. Despite extensive application in nursing, education and research, little has been done with the model in large-scale outbreaks of diseases such as pandemics. Furthermore, the model acknowledges primary prevention, but the strategies of primordial prevention altering the stressors prior to the exposure to risk are unclear, particularly in children mental health (Ahmadi et al., 2020).

This theoretical gap is significant in the circumstances of pandemics-related stress among preadolescents. Some of these stressors include isolated situation over time, broken schooling, too much screen time, fear of sickness and changed family structure accumulate with time. It is possible that long-term effects on psychology will not be prevented since these stressors are treated once they manifest. The recent studies emphasize the importance of the early, developmentally suitable, situation-related interventions that strengthen resilience, adaptive coping, emotional literacy and general psychosocial health in children (Masten and Barnes, 2018; Loades et al., 2020). With few children mental health professionals available in India, practical and scalable child mental health prevention pathways relying on nursing and systems theory can offer a viable and sustainable solution to mental health concerns in India.

To address these gaps, the current research has developed the Stress-Releasing Preadolescent Pandemic Care Pathway (SRPPCP). It changes the Betty Neuman Systems Model to incorporate primordial and primary prevention. The pathway is evidence-based and specific to the needs of school-going preadolescents. It concentrates on timely forecasting of stressors of pandemic, enhances diverse buffers of defence by use of psychosocial support, enhances coping assets and propagates overall wellness-physical, mental, social and spiritual. The design procedure involved the current evidence,

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professional certification and usefulness to school and family circumstances in India.

The basis of the modified framework and the SRPPCP was formed by an in-depth literature review. The systematic review was done according to PRISMA-S protocol of comprehensive search, screening, synthesis and analysis. Systematic reviews, meta-analyses, and primary studies conducted recently present the high rates of anxiety, depressive symptoms, stress, and emotional maladjustment in the preadolescent group due to COVID-19 (Racine et al., 2021; Viner et al., 2022). These trends are verified in Indian studies and referenced to pandemic-specific stress factors like social isolation, fear of contagion, academic disruptions, and too much time on the screen and stress spillover by parents (Sharma et al., 2021; Gupta and Agrawal, 2022). It is also supported by the available literature that resilience-building, preventive and school-linked psychosocial interventions decrease stress and enhance adaptive functioning of children.

However, the review also revealed critical gaps in existing pandemic care frameworks. Most interventions were either short-term, symptom-focused, or targeted older adolescents and adults, with limited attention to preadolescents as a distinct developmental group. Additionally, few studies employed a robust theoretical framework to guide intervention design, implementation, and evaluation. These gaps reinforced the need for a structured, theory-based, and developmentally sensitive care pathway capable of addressing pandemic-related stress at an early stage. The identified knowledge gaps directly informed the modification of the Betty Neuman Systems Model and the development of the SRPPCP, positioning the present study as a timely and contextually relevant contribution to child and adolescent mental health research.

Against this backdrop, the present study was undertaken to generate, validate, and evaluate the Stress-Releasing Preadolescent Pandemic Care Pathway and to compare the efficacy of interventions derived from the modified model with those based on the conventional Betty Neuman Systems Model. By integrating theoretical rigor with empirical validation, the study aims to advance evidence-based nursing practice and contribute to the development of comprehensive pandemic mental health strategies for school-going preadolescents in India.

1. Research Design

Figure 1 shows the literature search and selection model adopted in the present study based on PRISMA 2020. The figure demonstrates the identification, screening, eligibility test, and ultimate inclusion of studies in the order of occurrence. Records were first retrieved in databases like PubMed, MEDLINE, and Google scholar. Titles and abstract were filtered afterwards, and those studies that failed to meet the requirements were eliminated. Articles that contained full text were then evaluated as per their eligibility criteria and studies were to be scrapped out because of certain reasons which comprised of unavailability of the full text, no children or/and irrelevance to stress responding to the pandemic. The last step enumerates the number of studies that were used to make the qualitative synthesis, which illustrates the clear and methodologically sound process of evidence selection. The research design of the study was an evidence-based exploratory sequential study whereby a systematic developing, refining, and testing on an evidence-based intervention to reduce pandemic-related stress among school-going children were carried out. The investigative stage was selected because one can have qualitative results that can be used to formulate quantitative interventions with the following considerations: depth, in-view relevance and empirical focus (Creswell and Plano Clark, 2018). Phase I was aimed at the creation and testing of the SRPPCP. With the help of an interpretive paradigm, we also elicited professional attitudes regarding the stressor factors of the pandemic, coping requirements, and prevention interventions in preadolescents. Experts in the fields of nursing, mental health, pediatrics, psychology, and public health were in-depth interviewed. These interviews examined the applicability of the conventional Bet-no Neuman System Model to early stress prevention and received suggestions concerning how the theoretical-level changes can be applied in the situations of the pandemic. The data collected during the interview were transcribed word-to-word, thematically coded, and analyzed inductively to find patterns, concepts, and relations (Braun & Clarke, 2021). These themes formed the basis of the altered theoretical framework and the systematic progress of the SRPPCP. At the same time, a pandemic-specific stress assessment instrument was developed and tested by professionals to become relevant and developed in a way that is

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adequate and clear. The consistency, feasibility and (at least) preliminary applicability, of both the tool and the care pathway was then ensured by reliability testing and a pilot study, before the large-scale implementation. The phase 2 included a randomized controlled trial to determine the effectiveness of modified Betty Neuman-based intervention over the conventional one. The number of school-going children who were randomly selected to both experimental and control groups was one hundred, an aspect that minimized selection bias. The experimental group received the interventions which were based on the SRPPCP at the same time the control group had the strategies which are developed according to the traditional Bet_No Neuman System Model. Outcome measures were developmental, psychological, and behavioral measures as well as stress measures which were measured at both baseline and multiple follow-ups to refer to both short-term and long-term effects. Common inferential statistics were involved in testing the differences between the groups and the effectiveness of the interventions. This mixed-method design combined the generation of qualitative theory with the hypothesis testing of a quantitative approach and made the results obtained more valid and provided more sufficient evidence of multidisciplinary and preventive mental-health care pathways in preadolescents in the times of public health emergencies (Tashakkori and Teddlie, 2020).

The research question was to determine the effectiveness of modified and conventional interventions based on the Betty Neuman Theory in alleviating pandemic related stress and preadolescents. Primary objectives were to create baseline stress measurements, use interventions with modified and conventional theory of Neumann, as well as to compare the results with the help of valid measures like Pubertal Development Scale, Pediatric Symptom Checklist, Beliefs and Values Scale, and Perceived Stress Scale.

1.1 Tool Used

1. TAPPS Tool (Validated). The TAPPS Tool was a system of evaluation of the stressor levels related to the pandemic and the coping strategies among preadolescents, through which children have their perception of stresses as the disturbance in their daily routine, social isolation, and general uncertainty of stress. This assisted in determining the stress vulnerabilities in a systematic context-specific manner.

2. Pediatric Symptoms Checklist (PSC). The PSC was used to filter out emotional, behavioral, and psychosocial challenges, which promotes internalizing and externalizing symptoms including anxiety, depressed mood, and behavioral problems, which in most cases become more pronounced during emergencies of the public health.

3. Perceived Stress Scale (PSS). The PSS was used to assess the subjective level of stress preadolescents feel, which is the ways they evaluate the situations in their life as unpredictable, overwhelming, or hard to manage during the period of the pandemic.

4. Pubertal Development Scale. This scale was used to determine the physical and pubertal development stage of the participants and so the development variation was considered during the interpretation of the responses and psychological results of stress.

5. Beliefs and Values Scale. The scale had analyzed spiritual and value-based aspects of coping, measured belief systems of children, personal values, and a sense of meaning, which are important in coping with the emotional resilience and coping with stress adaptively.

2. Methodology

2.1 Methodological Framework for the Modified Betty Neuman–Based Intervention Pathway

Figure 2 shows the methodological approach to use in the present investigation that operationalizes the adapted Betty Neuman Systems Model to measure, intervene, and gauge the pandemic-related stress among preadolescents. The four-stage postural framework consists of interrelated steps of input, throughput, intervention, and output which represent a systems-based reasoning of association between personal stress experiences and preventive measures of intervention. Figure 2 demonstrates that Figure 2 shows the input stage, which is comprised of inflicted stressors on a multidimensional scale, including disrupted routines, heavy digital reliance, academic shutdown, financial pressure in the family, anxiety, and depressive symptoms in the intrapersonal, interpersonal, and extraparental realms that have risen during the pandemic. The said stressors interplay with core client variables: physiological, psycho-

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sociocultural, developmental, and spiritual variables that are measured at the baseline using standardized and validated instruments. The throughput stage symbolizes the individual responses to stress based on the normal line of defense and lines of resistance, which enables the determination of the levels of vulnerabilities and points of intervention in line with Neuman assumptions (Neuman and Fawcett, 2011). Based on this evaluation, the intervention stage is planned into primordial, primary, secondary, and tertiary preventive measures. Primordial prevention aims at the upkeep of resilience by means of awareness training, positive psychology practice, clarification of values, and gratitude practices prior to the onset of stress. Such primary prevention methods as systematic health education, cleanliness, healthy diet, and lifestyle alteration to decrease the penetration of stressors are applied. In secondary prevention, an emphasis is placed on the aspect of early detection, early referral, and specific interventions with children who experience higher levels of stress, whereas in tertiary prevention, rehabilitation with the help of guided physical activity, sleep hygiene, and long-term psychosocial support is introduced to stabilize the systems in children. Lastly is the output phase, which measures outcomes regarding standards of normalized physical, psychological, sociocultural, developmental and spiritual functioning with an aim of minimizing or ensuring the stress to low manageable levels. By overlaying assessment, intervention, and outcome measures in to one logical framework, Figure 2 illustrates how the adapted model can apply theory to a repeatable methodological route, which combines internal consistency, cross-comparability of conventional and modified interventions, and consistency with holistic child health-based principles.

2.2 Generation and Validation of the Tool

- Generation and validation of the newly developed TAPPS tool to identify stressors related to pandemic.
- Generation, validation and testing for efficacy of the Newly Developed Stress Releasing Preadolescents Pandemic Care Pathway (SRPPCP).

2.2.1 Content Validity

Table 1 shows achievement of the expert agreement and Content Validity Index (CVI) of 6 lifted subject-matter experts. The results indicate the high degree of the level of consensus on most items, and ten out of eleven questions demonstrate the perfect item-level validity (I-CVI = 1.00). There was also low agreement with a single item (Q8) (I -CVI = 0.67) that requires subtle adjustment, as opposed to exclusion. The mean content validity index (S -CVI/Ave) of 0.96 and universal agreement index (S -CVI/UA) of 0.90, at the scale level, were above acceptable criteria of excellent content validity. All in all, the obtained findings prove that the proposed instrument is highly relevant, understandable, and accepted by experts which makes it appropriate to be used further in empirical research.

Table 1. Expert Agreement and Content Validity Index (CVI) for Questionnaire Items.

Item	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	No. of Experts in Agreement	I-CVI	Universal Agreement (UA)
Q1	1	1	1	1	1	1	6	1	1
Q2	1	1	1	1	1	1	6	1	1
Q3	1	1	1	1	1	1	6	1	1
Q4	1	1	1	1	1	1	6	1	1
Q5	1	1	1	1	1	1	6	1	1
Q6	1	1	1	1	1	1	6	1	1
Q7	1	1	1	1	1	1	6	1	1

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Q8	0	0	1	1	1	1	4	0.67	0
Q9	1	1	1	1	1	1	6	1	1
Q10	1	1	1	1	1	1	6	1	1
Q11	1	1	1	1	1	1	6	1	1
Average / Scale Level								**S-CVI/Ave = 0.96**	**S-CVI/UA = 0.90**

Note: 1 = Relevant, 0 = Not relevant

i. Experts in agreement: expertise are counted as 1, the experts in agreement for Q8 (0+ 0 + 1 +1 + 1 + 1) = 4. Other scores for each item are 6.

ii. Universal agreement (UA): all items got universal agreement of 1 but Q8 got 0 as it do not got approval by all experts.

iii. I-CVI: the expert in agreement divided by the number of experts, for example ICVI of Q8 is 4 divided by 6 experts that is equal to 0.6, hence removed that item.

iv. S-CVI/Ave (based on I-CVI): the average of I-CVI scores across all items, for example the S-CVI/Ave [(6+6+6+6+6+6+6+4+6+6+6)/11] is equal to 0.96.

v. S-CVI/Ave (based on proportion relevance): the average of proportion relevance scores across all experts, the S-CVI/Ave [(0.90 + 0.90 + 1+ 1 + 1 + 1)/11] is equal to 0.96.

Based on the above calculation, we can conclude that I-CVI, S-CVI/Ave and SCVI/UA meet satisfactory level, and thus the scale of TAPPS Tool has achieved satisfactory level of content validity.

Evaluation of the Theory Developed

The comparing and contrasting of the Stress Releasing Preadolescents Pandemic Care Pathway (SRPPCP) to the traditional Betty Neumann Systems Model was done to establish the relative capabilities of the two to reduce stress in school-going pre-adolescents in times of pandemics. The SRPPCP was designed in relation to several multidimensional stressors that were worsened with long-term disruptions, uncertainty, and social isolation, and a high focus on primordial and preventative measures. The traditional Neumann model, on the contrary, deals with generalized responses of stress and typical lines of defense. The comparative analysis was aimed at analogy of modifications in the psychological, developmental, sociocultural, and emotional outcomes resulting of applying both interventions. The results emphasized the capacity of the SRPPCP to offer a context-responsive, child-focused, and preventive methodological approach resulting in better stress management and adaptive coping in the respondents. This analogy explains why existing theoretical frameworks should be adjusted to suit more precisely the specific psychosocial requirements of preadolescents amid the pandemic of a health threat to society.

Research Question

Research Questions

- **RQ1:** To determine whether the Tool for Assessing Preadolescents' Pandemic Stress (TAPPS) is valid, reliable, and accurate for identifying stressors among school-going preadolescents.
- **RQ2:** To evaluate whether the newly developed Stress Releasing Preadolescents Pandemic Care Pathway (SRPPCP) is valid, reliable, and effective in reducing stress among school-going preadolescents.

2. Type of Study

- The study adopted a **mixed method randomized controlled trial design**, integrating qualitative and quantitative approaches to ensure comprehensive evaluation.
- The trial was prospectively registered with the **Clinical Trials Registry of India (CTRI Reg. No.: CTRI/2021/01/030460)**.

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3. Research Setting

The study was conducted in two selected schools located in Wardha district, Maharashtra, India:

- Alphonsa High School, Sawangi, Wardha
- St. Antony National School, Civil Lines, Wardha

4. Study Participants

- The participants included **school-going preadolescents** enrolled in the selected schools.

5. Sample Size

A total of **100 preadolescents** were included in the study.

- Experimental group: 50 participants
- Control group: 50 participants

6. Study Variables

1. Demographic Variables

- Age
- Father's education
- Father's occupation
- Mother's education
- Mother's occupation
- Socioeconomic status

1. Clinical Variables

- **Physiological parameters**
  - Height
  - Weight
  - Blood pressure
  - Hemoglobin level
  - Secondary sexual characteristics
- **Psycho-sociocultural domain**
  - Behavioral patterns
- **Developmental domain**
  - Pubertal development
- **Spiritual domain:**
  - Faith in a supreme power
  - Beliefs and values

2. Outcome Variable

- Stress affecting the mental health of preadolescents.

7. Study Setting and Population

The study population comprised **school-going preadolescents aged 9–13 years** studying in selected schools of Wardha district.

8. Inclusion Criteria

1. Students aged between **9 and 13 years.**
2. Ability to comprehend the language used in the study.
3. Written **parental or guardian consent** obtained.

9. Exclusion Criteria

1. Children with a **diagnosed mental health disorder**
2. Children with **chronic medical conditions** that could influence stress levels or participation.

Intervention

The research builds upon the classical Neumann model by introducing emphasis on early prevention as well as the creation of psychological resistance to the onset of stress. It is based on the Stress Releasing Preadolescents Pandemic Care Pathway (SRPPCP), which is provided in age-specific, systematic workshops. The model does not only focus on minimizing stress which all individuals do but on enhancing general well-being of the mind. The most important ones are positive-psychology practices that help to strengthen optimism and emotional balance, and gratitude journaling to point out the positive moments. Lessons on self-compassion can be used to make preadolescents come to terms with themselves and reduce self-criticism (at a delicate age). The character strengths are also taught by the program allowing children to explore and apply their personal strength, resilience, empathy, and perseverance. Also, it provides psychoeducation on puberty and adaptive coping through which changes can be normalized to alleviate anxiety. The model promotes the holistic health by combining guidance induction and practice. In brief, this is an enhanced version of Neumann that shifts to proactive treatment and maintains a low stress level and high coping factors among the school-going preadolescents.

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2.5.1 Conventional Model

Figure 3 demonstrates the way participants passed the randomized controlled trial according to the CONSORT guidelines. Our initial sample was 120 school going preteenagers. Twenty were filtered out: 10 failed to qualify, 8 because they rejected them, and 2 because of other reasons. The rest 100 was randomly allocated to an experimental group (50) and control group (50). No interventions were missed, and all the subjects were given their respective interventions. There were follow-up visits at day 7, 3 months post-intervention, and 6 months post-intervention. The retention and adherence in the group were high and no dropouts or stopped treatments were seen in both groups. None of the data were lost and all the participants (50 in each group) were counted in the analysis. The attrition and protocol deviations are not observed which serves as evidence of the study internal validity and confidence in the findings. In general, Figure 3 reflects a rigorous methodology of the trial and valid comparison of groups.

Results and Discussion

Statistical Analysis

Socio-demographic variables

Table 2 compares the baseline demographics of both experimental group and the control group, which were found to be the same in all the various variables measured. all the children were 12-13 years old and therefore, there were no age bias. Gender proportions were almost the same (X 2=0.52, p=0.46). Education of parents was also at record level (father: χ 2=4.91, p= 0.17; mother: 2=5.26, p= 0.15). The occupation of both the father and female was not different (p > 0.05). There was no difference in the socio-economic status (2 =4.26, p=0.37), and there was no difference in religious affiliation (2 = 2.59, p=0.27). Therefore, baseline was well balanced (Table3) to confirm internal validity and attribute differences post-intervention in the care pathway and not demography.

Table 2. Comparison of Demographic Characteristics of Preadolescents in Experimental and Control Groups.

Demographic Variables	Experimental Group n (%)	Control Group n (%)	χ^2 value (p-value)
Age (years)			
10–11	0 (0)	0 (0)	–
12–13	35 (100)	35 (100)	–
Gender			0.52 (p = 0.46, NS)
Male	16 (45.7)	13 (31.1)	
Female	19 (54.3)	22 (62.9)	
Transgender	0 (0)	0 (0)	
Education of Father			4.91 (p = 0.17, NS)
Illiterate	0 (0)	0 (0)	
Primary	2 (5.7)	5 (14.3)	
Secondary	8 (22.9)	14 (40.0)	
Graduation	12 (34.3)	8 (22.9)	
Other	13 (37.1)	8 (22.9)	
Education of Mother			5.26 (p = 0.15, NS)

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Illiterate	0 (0)	0 (0)	
Primary	2 (5.7)	5 (14.3)	
Secondary	10 (28.6)	16 (45.7)	
Graduation	14 (40.0)	10 (28.6)	
Other	9 (25.7)	4 (11.4)	
Occupation of Father			5.95 (p = 0.20, NS)
Government	4 (11.4)	6 (17.1)	
Private	12 (34.3)	9 (25.7)	
Business	4 (11.4)	7 (20.0)	
Labour	1 (2.9)	5 (14.3)	
Other	14 (40.0)	8 (22.9)	
Occupation of Mother			2.36 (p = 0.50, NS)
Government	3 (8.6)	4 (11.4)	
Private	4 (11.4)	3 (8.6)	
Business	2 (5.7)	0 (0)	
Labour	0 (0)	0 (0)	
Other	26 (74.3)	28 (80.0)	
Socio-economic Status			4.26 (p = 0.37, NS)
Upper	1 (2.9)	0 (0)	
Upper Middle	13 (37.1)	11 (31.4)	
Lower Middle	11 (31.4)	7 (20.0)	
Upper Lower	4 (11.4)	9 (25.7)	
Lower	6 (17.1)	8 (22.9)	
Religion			2.59 (p = 0.27, NS)
Hindu	30 (85.7)	25 (71.4)	
Muslim	0 (0)	1 (2.9)	
Sikh	0 (0)	0 (0)	
Christian	0 (0)	0 (0)	
Others	5 (14.3)	9 (25.7)	

There is no significant difference between both the groups with p-value for gender religion, Socio-economic status, education an occupation of father and mother, Socio-economic status and age respectively.

Impact of the Intervention on Paediatric Psychological Well-Being at Six Months

Figure 4 shows the results of Paediatric Symptom Checklist at 6 months old that show distinct differences between groups. In the control, 25 were

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normal and 25 psychologically impaired measures enormous no changes in six months so that many children still experienced behaviors or emotional difficulties. The experimental subjects got better significantly: 44 children became normal and only 6 were impaired, the symptoms were reduced significantly. Inferential analysis proved that the difference in gains between 6 months is highly significant ($p < 0.01$), meaning that these gains would not have been because of chance. Clinically, the improvement of normal functioning among the experimental group is an indicator of improved emotions regulation, behavior stability and general adaptation. The persistence of impairments in the control condition highlights the necessity of specific treatments in the field of mental health among children. Combined, these outcomes indicate the effectiveness of the intervention and justify its introduction to the pediatric care plans as indicated in Figure 4.

Effect of the Intervention on Beliefs and Value Orientation at the Sixth Month

Figure 5 illustrates the distribution of the level of belief and values of the children in both groups, control group and experimental group, at the sixth-month evaluation. Most children in the control group were in the lower and mid-range groups: 12 were negatively rated as weak spirituality and 24 were rated as fair spirituality. Very few were higher and 8 and 6 were very spiritual and stronger spiritual respectively. Such a tendency shows that there was rather no natural development in the level of belief and value orientation without the intervention because most of the participants remained at the levels of suboptimality or middle and lower levels. On the other hand, the experimental group went significantly into higher categories. There were no weakly spiritual participants and only 3 participants were left in the good category. Majority of them attained higher levels: 25 children earned high spirituality and 22 earned stronger spirituality. Such redistribution proves that the systems of beliefs and value orientation are significantly increased, which can be credited to the intervention. The highly significant difference made at the sixth month (p.010.05) was confirmed and this ensured that the improvement that was witnessed in the experimental group is more likely to have been realized by chance. Regarding outcome measures, the almost complete removal of lower scales scores and the concentration of participants in superior scale scores and belief, the intervention is quite critical and effective in creating positive psychosocial and spiritual growth. In the control group, in its turn, weaker and fair levels were maintained, which reflects the limited influence of routine conditions as such. In general, the findings give solid empirical evidence to support the use of the intervention on reinforcing beliefs and values as time goes by as presented in Figure 5.

4.1 Influence of the Intervention on Perceived Stress Levels at the Sixth Month

Figure 6 is the distribution of perceived stress-levels by the control and experimental group members at the six-month follow-up. The outcomes indicate that there is a stark difference in the stress profiles of the two groups, so there is a significant effect of the intervention in the long term. In the control group, most subjects were still at low level of stress: 42 belonged to this group and 7 participants had no stress and 1 member moved to moderate stress. This is an indication of minimal response in perception of stress in the normal setting, where they were mainly in the low stress zone. On the contrary, the distribution in the experimental group was significantly more favorable. A greater percentage (28) said that they experienced no stress during the sixth month which is an indication of having achieved total stress relaxation. Twenty-two subjects stayed in the low-stress category, and nobody graduated to moderate stress. The fact that moderate cases of stress were not observed in the experimental group depicts the reduction of stress, as well as successful deterrence of stress development during follow-up. The experimental cohort also changed its low and moderate stress state to the no-stress one compared to the control one, which points to the practical applicability of the intervention. These observations are also B1 supported by inferential analysis, which indicates that the experimental and the control groups differ significantly at the sixth month (panked 0.01 at 0.05). This fact proves that the benefits related to the stress perception in the experimental group are not the results of the randomness but can be unquestionably explained by the intervention. The results highlight the abilities of the intervention to increase the coping strategies to stresses as well as the promoting the emotional resilience and the wellness of the psychology. The situation of the comparatively fixed stress pattern of the control group supports the

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weak effect produced by the mere presence of standard conditions. Together, these findings offer good empirical evidence of the effectiveness of the intervention at lowering perceived stress levels as demonstrated in Figure 6.

4.2 End Point Result

The Paediatric Symptom Checklist was evaluated to determine the improvement of different psychological and developmental functions. At the control group, there was a 20 per cent baseline presence, and at the experimental group, there was a significant improvement of 28 per cent at the same time. In terms of beliefs and values, the control group registered a 12 per cent baseline, as opposed to 44 per cent in the experimental group indicating that there was an immense improvement in concurrence with the personal values. The same tendency could be observed in the case of stronger spirituality: only 12 percent among the control group participants made any progress, and 44 percent among the participants of the experimental group achieved significant growth. Concerning the level of stress, 14 percent of the non-experimental group had no stress with 56 percent of the experimental group having a significant drop in perceived stress level indicating a significant reduction in perceived stress in the group with the modified intervention. Overall, the results indicate that there were important improvements in the experimental modified model in various dimensions. The experimental group participants adapted better to pubertal development, scored higher on the Paediatric Symptom Checklist six months later, and made significant positive improvement in beliefs, values, and spiritual strength. The experimental group reported significantly less perceived stress, as was determined by the Perceived Stress Scale (PSS), which showed better coping and emotional resiliency. Together, these findings emphasize the efficiency of the updated model in fostering the psychological wellness as well as adaptive developmental outcomes among pediatric populations.

Discussions

5.1 Comparative Efficacy and Statistical Superiority of the SRPPCP

The researchers concluded that the Stress Releasing Preadolescents Pandemic Care Pathway (SRPPCP) created an evident statistical benefit when compared to the conventional Betty Neuman Systems Model in the reduction of perceived stress in preadolescent students. The chi-square test provided a value of 19.85 that is significantly higher than the critical value of 6.25 as a 20 percent superiority margin. The value was found to be less than the rejection region on the null hypothesis, so we rejected the null and accepted the alternative. The outcome establishes that SRPPCP was a strong factor in bettering perceived stress by over 20 per cent than the conventional model hence it is much more effective in managing stress due to the pandemic. By the six-month follow-up, a statistically significant relationship was also found between group assignment and pubertal development (p: 0.015 has a value of 0.05). This observation justifies the delicate nature of self-assessment as a tool of detecting developmental changes. Walker et al. (2017) also found these outcomes and discussed the usefulness of self-assessment in several studies.

5.2 Multidimensional Outcome Improvements at Six-Month Follow-Up

On a more detailed examination of the six-month data, a significant difference between the experimental and control group was noted in a variety of psychosocial aspects. Behavioral and emotional problems were significantly less in the SRPPCP group ($p<0.01$), which is also in agreement with Jellinek et al. regarding the sensitivity of the checklist. There was also an improvement in the scores of spirituality achieved using the Beliefs and Values Scale, which utilized the Beliefs and Values Scale demonstrating that involvement in personal beliefs facilitates good psychosocial outcomes (Henderson et al., 2016). Another measure, perceived stress measured using the Perceived Stress Scale, reduced significantly after six months ($p < 0.01$), which validated the co-authored scale against other researchers (Davis et al., 2017). These findings support the conclusion that SRPPCP is an effective stress management tool as well as leads to an improvement in overall well-being. Its emphasis on primordial prevention, positive psychology and psychological fortification holds greater and longer lasting benefits compared to traditional methods, and it is suggested that anticipatory guidance and resilience-based approach be adopted in interventions based on nursing theories.

Conclusions

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The present study conclusively demonstrates the statistical and practical superiority of the Stress-Releasing Preadolescent Pandemic Care Pathway (SRPPCP) over the conventional Betty Neuman Systems Model in mitigating pandemic-related stress among school-going preadolescents. Robust validation outcomes established the scientific rigor of the newly developed TAPPS tool, which achieved excellent content validity (S-CVI/Ave = 0.96; S-CVI/UA = 0.90), confirming its appropriateness for pandemic-specific stress assessment in this age group. Baseline comparisons revealed no statistically significant differences between the experimental and control groups across demographic and clinical variables ($p > 0.05$), ensuring internal validity and enabling unbiased outcome attribution. At the six-month follow-up, statistically significant improvements were consistently observed in the experimental group across all major outcome domains. Psychological well-being, measured using the Paediatric Symptom Checklist, showed a pronounced shift toward normal functioning, with 88% of children in the experimental group classified as psychologically normal compared to only 50% in the control group ($p < 0.01$). This reflects a clear reduction in emotional and behavioral difficulties attributable to the intervention.

Beliefs and values demonstrated one of the most substantial gains. At six months, 94% of children in the experimental group achieved high to stronger levels of spirituality, compared to only 28% in the control group, yielding a highly significant group difference ($p = 0.01$). This finding underscores the effectiveness of integrating value-based and resilience-enhancing components into preventive mental health care. Similarly, perceived stress outcomes revealed a marked reduction in the experimental group, where 56% of participants reported no stress at follow-up, compared to just 14% in the control group ($p < 0.01$). Notably, no participant in the experimental group progressed to moderate stress, indicating successful prevention of stress escalation.

The comparative efficacy analysis further confirmed the statistical strength of the SRPPCP, with a chi-square value of 19.85 exceeding the critical value of 6.25, thereby rejecting the null hypothesis and demonstrating over 20% superiority relative to the conventional model. Collectively, these statistically significant outcomes provide strong evidence that the modified, prevention-focused Betty Neuman–based pathway not only reduces stress but also enhances developmental adjustment, psychosocial stability, and resilience in preadolescents. The findings advocate for the adoption of SRPPCP as a structured, evidence-based framework for school-centered mental health promotion during pandemics and comparable public health crises.

6.1 Future Scope

Integrating SRPPCP into school-based health programs, carrying out massive trials in different areas, and qualifying the pathway to digital tele-health are some of the essential measures to increase its coverage. Implementing the program in schools introduces preventative mental health activities during standard education, which helps identify stressors beforehand and learn to resist them. Mass, geographically distributed trials will confirm the generalizability and cultural competence of the pathway and can be improved on with data specifically to bring about changes in response to different socioeconomic and demographic environments. A digital tele-health variant is a scalable remote delivery format that is particularly useful in situations with fewer trained personnel, as well as in the case of emergencies in the field of a pandemic, that is, in places when there is no possibility of physical interaction. Together, such measures can expand the scope, availability, and effectiveness of SRPPCP to become a popular model of promoting the psychological health of school-going preadolescents in ordinary and emergent circumstances.

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