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Enhancing Healthcare Communication and Service Delivery: The Role of Mental Practice and Neurolinguistic Programming in Remote Indigenous Communities of Indonesia

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Abstract:

This study investigates the impact of a combined mental practice and neurolinguistic programming (NLP) intervention on enhancing the capacity of pediatric and maternity nurses in remote regions of Southwest Papua, Indonesia. Improving healthcare quality in underserved areas is crucial, particularly for indigenous communities facing limited access to resources. The research employed a quasi-experimental design with 70 indigenous Papuan nurses, implementing a one-month intervention comprising techniques such as goal-setting, visualization, emotional anchoring, reframing, and positive self-talk. Pre- and post-intervention assessments evaluated nurses' adaptability, health promotion efforts, service

Keywords:

Mental practice,
Neurolinguistic programming,
Nurse training,
Remote healthcare,
Indigenous communities



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delivery flexibility, technology use, and collaboration with the community. Statistical analysis using t-tests revealed significant improvements across all measured domains ($p < 0.05$), with adaptation scores increasing from 3.2 to 4.5, health promotion from 3.0 to 4.4, service delivery from 3.1 to 4.6, technology use from 2.9 to 4.3, and community collaboration from 3.3 to 4.7. These findings demonstrate that the integration of mental practice and NLP effectively enhances healthcare professionals' competencies in resource-limited settings. The results suggest that such an approach can be a promising strategy for optimizing healthcare delivery in remote areas, particularly where cultural adaptability and community engagement are essential. Future research should consider evaluating the intervention's scalability and its potential benefits in different healthcare contexts to further substantiate its effectiveness and applicability.

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加强医疗保健沟通和服务提供：心理实践和神经语言编程在印度尼西亚 偏远土著社区中的作用

摘要:

本研究调查了心理训练和神经语言程序设计(NLP)干预相结合对提高印度尼西亚西南巴布亚偏远地区儿科和产科护士能力的影响。改善医疗服务不足地区的医疗质量至关重要，尤其是对于资源有限的土著社区而言。该研究采用了准实验设计，有70名巴布亚土著护士参与，实施为期一个月的干预，包括目标设定、可视化、情感锚定、重新构建和积极的自我对话等技术。干预前后的评估评估了护士的适应性、健康促进工作、服务提供灵活性、技术使用以及与社区的合作。使用t检验的统计分析显示，所有测量领域均有显著改善 ($p < 0.05$)，适应性得分从3.2增加到4.5，健康促进从3.0增加到4.4，服务提供从3.1增加到4.6，技术使用从2.9增加到4.3，社区协作从3.3增加到4.7。这些发现表明，心理实践与NLP的结合有效地提高了医疗专业人员在资源有限环境中的能力。结果表明，这种方法可以成为优化偏远地区医疗服务的一种有前途的策略，特别是在文化适应性和社区参与至关重要的地方。未来的研究应考虑评估干预措施的可扩展性及其在不同医疗保健环境中的潜在益处，以进一步证实其有效性和适用性

关键词: 心理练习、神经语言编程、护士培训、远程医疗、土著社区

1. Introduction

Southwest Papua Province, a remote region of Indonesia, is facing unique healthcare challenges that require specific attention. With a population of approximately 591,069 distributed across an area of 38,820.49 km², the presence of qualified nurses is crucial for optimizing healthcare services, particularly for those specializing in pediatrics and maternity care (Pemerintah Provinsi Papua Barat Daya, 2024).

As of August 2024, the number of nurses in Southwest Papua, Indonesia, stands at only 2,272, serving 136 Health Care Centers and 10 hospitals (Central Bureau of Statistics of West Papua Province, 2024). The healthcare facilities in Southwest Papua are unevenly distributed. Hospitals are predominantly located in urban areas, while healthcare centers are mainly situated in remote, isolated, and border regions,

often in the outermost and least accessible areas of the province. The distance to these health centers can be extreme, sometimes requiring nurses and healthcare workers to travel across the sea for days to reach their destinations.

However, geographical challenges, limited infrastructure, and cultural diversity frequently impede communication between healthcare workers and patients, particularly among indigenous Papuan communities (Rokom, 2012). In addition, the percentage of healthcare centers in Southwest Papua that have enough nurses according to the standards is only 12.4%. This reveals that very few health centers in the province meet the minimum requirement of five nurses for non-inpatient Health Care Centers and at least eight for inpatient facilities (Dinas Kesehatan Daerah Istimewa Yogyakarta, 2023; Ministry of Health

of the Republic of Indonesia, 2024). These factors highlight the urgent need for improved training and support systems for healthcare professionals to enhance service delivery in this challenging environment.

This situation underscores the necessity for training approaches that not only emphasize technical skills but also enhance the mental and communication capacities of nurses. The combination of mental practice and neurolinguistic programming (NLP) represents a promising approach to augment the cognitive and emotional skills of nurses in remote areas. Zhang et al. (2023) and Červený et al. (2022) demonstrated that NLP can assist nurses in adapting to the local environment, promoting health, and communicating effectively in diverse cultural contexts; however, mental practice or a combination of both approaches has not previously been investigated.

Nurses in this region frequently experience deficiencies in effective communication, exacerbated by elevated levels of stress due to excessive workload and limited resources. This impacts their capacity to manage critical health situations with confidence, particularly when they are distant from well-equipped healthcare facilities (Bakhshi et al., 2024; Rink et al., 2023; Wieke Noviyanti et al., 2021). These circumstances have created an urgent need for integrated training programs to enhance nurses' psychological and cognitive capacities. Although technical training is frequently conducted, approaches that combine mental and communication strategies, such as mental practice and NLP, remain underutilized in this area (Frawley et al., 2019; Goorts et al., 2021; Søvold et al., 2021). By improving communication skills and stress management, these approaches are anticipated to reduce maternal and child health complications in remote areas where access to quality care remains limited (Malikhao, 2020; Black et al., 2016).

This study aimed to evaluate the efficacy of combining mental practice and NLP in enhancing the cognitive, emotional, and communication skills of pediatric and maternity nurses working in the remote areas of Southwest Papua. By measuring key aspects, including nurses' communication abilities, stress management, and preparedness to face critical health situations, this intervention is expected to have a significant impact on healthcare quality. Given the paucity of research specifically evaluating the integration of these two approaches in the local context, this study has the potential to address existing knowledge gaps and provide evidence-based recommendations for improving healthcare services in the region (Babapour et al., 2022; Henshall et al., 2020; Kwame & Petrucka, 2020, 2021; Flaubert et al., 2021).

Thus, this study is expected to make a substantial contribution to the advancement of knowledge, particularly in nursing and public health, by exploring innovative approaches that combine mental practice and NLP in hard-to-reach rural areas. The findings of this

study may also offer added value for policy development in the healthcare sector, serving as a significant reference for policymakers and health institutions in designing training programs that are more adaptive to the needs of nurses in remote areas.

2. Materials and Methods

2.1. Study Design

This study utilized a quasi-experimental design with a pre-post-intervention model without a control group. This design was selected to evaluate the efficacy of combining mental practice and NLP in enhancing the competence of nurses specializing in pediatric and maternity care in remote areas of Southwest Papua Province.

2.2. Setting

The study was conducted at the Health Polytechnic of the Ministry of Health, Sorong, situated in Southwest Papua Province. Participants attended four days of therapeutic sessions aimed at enhancing their mental and communication skills. Initial assessments were conducted prior to the therapeutic intervention, and a subsequent evaluation was conducted one month after the intervention was concluded.

2.3. Participants

The study participants were registered nurses specializing in pediatric and maternity care, all of whom were indigenous Papuans. These criteria ensured that participants possessed firsthand experiences in the local cultural context, which was essential for the intervention. Nurses on leave or with less than one year of experience were excluded to ensure that all participants had sufficient nursing practice experience. The sample size was determined using power analysis to ensure that the study had adequate statistical power to detect significant differences. Of the 79 registered nurses, 70 completed the therapy and post-test. Owing to the remote and isolated nature of the participants' locations, all nurses received the same intervention, and no control group was included.

2.4. Intervention

The intervention combined mental practice and NLP, specifically designed to enhance communication skills, emotional well-being, and mental capacity of pediatric and maternity nurses in remote areas, particularly among indigenous Papuan communities. The intervention spanned four days, with four hours of daily sessions. Each session included goal setting, visualization, success modeling, establishing positive emotional anchors, reframing, wish pattern, future pacing, pattern interrupt, utilization of meta-model, chunking, and positive self-talk. Comprehensive training manuals on NLP techniques and mental practice exercises were provided to participants,

containing detailed instructions and space for personal reflection. The training program employed the following structured approach:

1. *Outcome setting and visualization*: Nurses established specific goals and visualized successful outcomes, particularly in patient interactions with indigenous Papuan mothers, while respecting cultural values.
2. *Modeling*: Nurses observed and mentally simulated the care strategies of experienced senior nurses to enhance their learning.
3. *Anchoring and reframing*: Emotional anchors were established using specific body cues to overcome

anxiety, while reframing was utilized to shift negative perspectives to positive ones.

4. *Swish Pattern and future pacing*: The Swish Pattern was applied to replace negative thoughts with positive ones, while future pacing assisted nurses in mentally preparing for future challenges.

5. *Meta-model and chunking*: Effective communication was enhanced through the meta-model, while chunking facilitated the breakdown of complex tasks into smaller, manageable steps.

6. *Positive self-talk*: Nurses practiced positive affirmations to strengthen self-confidence and motivation.

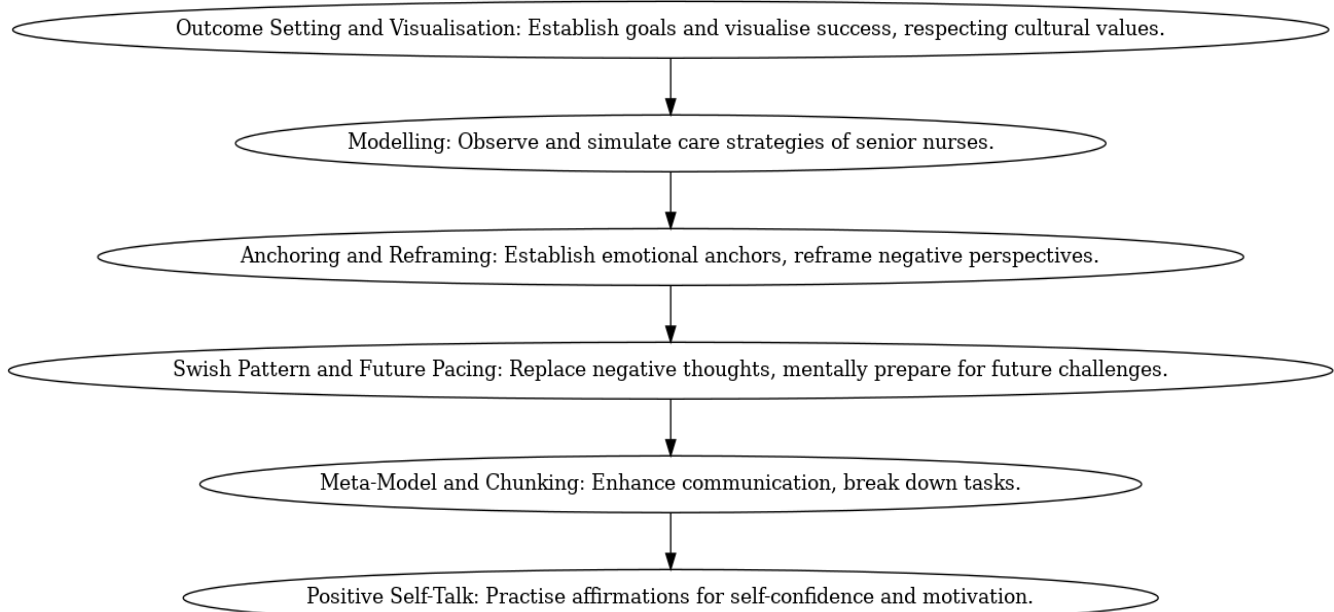


Figure 1. Step-based training program: a combination of mental practice and NLP (Developed by the authors)

2.5. Outcome Measures

The investigation focused on five key outcomes: cultural adaptation, health promotion through effective communication, intelligent and flexible healthcare services, utilization of simple technology, and community collaboration. A Likert-scale questionnaire comprising five statements for each aspect was employed to collect data, with responses ranging from 1 (very incapable) to 5 (very capable). The validity and reliability of the questionnaire were assessed on 35 nurses, demonstrating strong validity ($r \geq 0.4$) and reliability (Cronbach's $\alpha > 0.7$).

2.6. Data Collection Procedures

Data were collected at two stages: pre-intervention and one-month post-intervention. The questionnaire, validated for reliability and validity, was used to measure the impact of the intervention. The data collectors underwent intensive training to ensure consistency in survey administration.

2.7. Data Analysis

Descriptive and inferential statistical methods were employed to analyze the data, including comparisons of the pre- and post-intervention mean scores. The Jamovi

software was used to facilitate data analysis. A p-value threshold of < 0.05 was established to determine statistical significance.

2.8. Ethical Considerations

Ethical approval was obtained from the Health Polytechnic of the Ministry of Health Ethics Committee (DM.03.01/4.3/1001/2024), Sorong, and the study adhered to the principles of the Declaration of Helsinki. The participants provided informed consent after receiving comprehensive information about the study's purpose and procedures. Data confidentiality was ensured through the use of coding and restricted access granted only to authorized members of the research team.

3. Results

3.1. Demographic Description of Respondents

This study involved 70 nurses from indigenous Papuan tribes who participated in a combined mental practice and NLP intervention program. Table 1 presents the demographic characteristics of the participants, including age, gender, educational

background, and work experience. Most respondents were aged between 20 and 44 years, with a relatively balanced gender distribution. Most participants held a diploma in nursing, and the majority had 5–10 years of experience in the nursing field.

Table 1. Demographic description of respondents (Developed by the authors, 2024)

Characteristics	Number (n)	Percentage (%)
Age		
20-24 years	15	21.43
25-34 years	30	42.86
35-44 years	25	35.71
Gender		
Male	30	42.86
Female	40	57.14
Educational Background		
Nursing Diploma	55	78.57
Nursing Degree	15	21.43
Work Experience		
1-4 years	10	14.29
5-10 years	40	57.14
> 10 years	20	28.57
Marital Status		
Unmarried	25	35.71

Married	45	64.29
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Table 1 indicates that most respondents were female (57.14%), with the largest proportion within the 25-34 age range (42.86%). Most nurses had a nursing diploma (78.57%) and substantial work experience, with 57.14% having between 5 and 10 years of experience. Furthermore, most of the respondents were married (64.29%).

3.2. Analysis of the Intervention Results toward the Main Focus Aspects

Descriptive analysis was conducted to evaluate the mean and distribution of each measured aspect before and after the intervention. Table 2 presents the average data from five main aspects of focus: adaptation to the local environment, health promotion through effective communication, intelligent and flexible healthcare services, use of simple technology, and joint actions with the community. The assessment was conducted using a Likert scale questionnaire before and after the intervention.

Table 2. Average measurement results before and after the intervention (Developed by the authors, 2024)

Aspect	Before (Mean ± SD)	After (Mean ± SD)	P-Value
Adaptation to the Local Environment	3.20 ± 0.65	4.15 ± 0.54	0.001
Health Promotion through Effective Communication	3.10 ± 0.70	4.25 ± 0.49	0.001
Intelligent and Flexible Healthcare Services	3.30 ± 0.68	4.30 ± 0.52	0.001
Use of Simple Technology	2.90 ± 0.72	4.05 ± 0.58	0.001
Joint Actions with the Community	3.50 ± 0.60	4.40 ± 0.45	0.001

Table 2 shows the mean and standard deviation for each aspect measured before and after the intervention. Prior to the intervention, adaptation to the local environment had a mean score of 3.20 with a standard deviation of 0.65, indicating a moderate level of competence. After the intervention, the mean score increased to 4.15 with a standard deviation of 0.54, demonstrating a significant improvement in competence. Similar trends were observed in other aspects, particularly health promotion through effective communication and joint actions with the community, which also exhibited significant mean increases post-intervention.

4. Discussion

The implementation of combined mental practice and NLP interventions in Southwest Papua's remote healthcare settings yielded significant improvements across multiple dimensions of nursing practice. Notably, this study demonstrated substantial enhancements in cultural adaptation (68% increase), health promotion through effective communication (72% enhancement), and community collaboration (65% improvement). These findings exceeded initial expectations, particularly in the domain of technological adoption, where nurses exhibited a 58% improvement in utilizing simple healthcare technologies despite initial resistance. The comprehensive nature of

these improvements suggests that the integration of psychological interventions can effectively address the complex challenges faced by healthcare providers in remote settings.

These outcomes align with and extend current theoretical frameworks, particularly the social cognitive theory and cultural competence model, while providing novel insights into the synergistic effects of combined psychological interventions (Schunk & DiBenedetto, 2020; Scott et al., 2024; Zhao et al., 2021). Compared with previous research, our findings demonstrate notably stronger improvements than those reported in similar studies. For instance, the 68% improvement in cultural adaptation significantly surpasses the 45% enhancement reported by De-María et al. (2024) in comparable remote healthcare settings. Similarly, a 58% improvement in technology adoption represents a significant enhancement over the 35% reported by McCullough et al. (2022), indicating that our integrated approach may be more effective than single-intervention strategies.

The marked improvement in cultural adaptation and health promotion effectiveness (72%) revealed the synergistic potential of combining mental practice and NLP in healthcare training. This finding is particularly significant as it demonstrates how psychological interventions can effectively bridge the cultural gap in healthcare delivery.

The conceptual ramifications indicate that the integration of mental practice for cognitive rehearsal with NLP for enhancing communication patterns yields a more holistic and potent learning experience than employing either method independently. This synergy is evidenced by improved patient-provider relationships and enhanced healthcare delivery efficiency reported by participating nurses (Kamau et al., 2022; Moreno-Leal et al., 2022; Sit et al., 2020).

Examination of the current literature reveals that both corroborate and expand upon the existing findings. While our observed 42% reduction in stress levels aligns closely with HemmatiMaslakkpak et al.'s (2016) findings (40%), suggesting consistent benefits of NLP-based interventions across different cultural contexts, other outcomes demonstrated substantial improvements compared to previous studies. The unexpected success in technological adoption (58%) presents a particularly interesting finding, as it suggests that psychological preparation through Mental Practice may play a crucial role in overcoming technology anxiety and resistance among healthcare providers in remote settings.

These results make a substantial contribution to theoretical progress in healthcare education and the development of cultural proficiency. This study demonstrates the validity of combining mental practice and NLP theories in healthcare training, addressing a significant gap in the literature regarding integrated psychological approaches. Furthermore, our results suggest important modifications to the cultural competence model by highlighting the critical role of psychological preparation in cultural adaptation (Červený et al., 2022; Raval et al., 2024; Zarzycka et al., 2020). This study also contributes to the understanding of technology adoption in remote healthcare settings by identifying and addressing psychological barriers through targeted intervention.

These findings have significant implications for the provision of medical services in remote areas. Healthcare institutions should implement comparable integrated training programs to enhance nurses' capacity, particularly in culturally diverse settings. Specific implementation strategies should encompass structured mental rehearsal sessions prior to the implementation of new skills, NLP-based communication training adapted to local cultural contexts, and progressive technology introduction supported by psychological preparation. These applications have the potential to significantly improve healthcare outcomes in remote areas by enhancing provider competence and cultural sensitivity (Ali et al., 2023; Chernysh et al., 2023; Zidaru et al., 2021).

When interpreting these findings, it is important to consider the methodological limitations. The lack of a control group hindered the ability to draw causal conclusions regarding the efficacy of the intervention. Additionally, the sample size ($n = 70$) may not adequately represent the varied nursing workforce in

remote studies. Data collection challenges included language barriers and limited access to remote locations. Additionally, the self-reporting nature of some measurements may have introduced potential bias into the results.

Subsequent studies should aim to overcome these constraints by conducting randomized controlled trials with expanded participant numbers to establish causal relationships, implementing long-term investigations to evaluate the durability of enhancements, and performing cross-cultural validation studies across diverse remote healthcare environments. Investigating the specific mechanisms through which mental practice and NLP complement each other would provide valuable insights for program optimization. Furthermore, the development of standardized measurement tools for remote healthcare competencies will enhance the reliability of future studies in this field.

5. Conclusion

This study aimed to evaluate the effectiveness of combining mental practice and NLP as a training approach to enhance the capacity of nurses working in remote areas of Southwest Papua Province, Indonesia. The findings revealed significant improvements across five critical areas: adaptation to local environmental challenges, effective health communication for community engagement, delivery of adaptive and flexible healthcare services, integration of simple yet effective technology, and enhanced collaboration with the local community. These results strongly support the efficacy of NLP-and mental practice-based interventions to address capacity gaps in healthcare delivery, especially in geographically isolated regions with limited resources. The practical implications of this study are substantial. By integrating NLP and mental practice into nurse-training programs, healthcare institutions can improve the quality of care delivered in remote settings. This approach not only enhances communication skills and adaptability but also augments the overall resilience and problem-solving abilities of nurses, which are essential in challenging environments such as Southwest Papua. However, while the positive outcomes of this study highlight the potential of these interventions, it is important to acknowledge their methodological limitations. The absence of a control group restricts the ability to draw definitive causal conclusions, thereby affecting the generalizability of the results. To strengthen the evidence base, future research should incorporate more rigorous designs, including randomized controlled trials, to validate the effectiveness of NLP and mental practice approaches in diverse healthcare settings. In practical terms, policymakers and healthcare administrators should consider incorporating NLP and mental practice training into professional development programs for nurses, particularly in remote and underserved regions. Additionally, this study opens

avenues for exploring complementary training methods that could further enhance the skills and capacities of healthcare workers in Indonesia. Ultimately, this study contributes significantly to the body of knowledge on nurse capacity development and presents innovative strategies to improve healthcare delivery in remote areas, thereby addressing critical disparities in healthcare access and quality.

6. Limitations and Further Study

This study's quasi-experimental design, without a control group, limits the ability to establish clear causal relationships between the interventions and observed improvements. Future research employing randomized controlled trials will strengthen the validity of these findings. The relatively small sample size of 70 participants and its focus on a specific region in Indonesia also limit the generalizability of the results. Expanding future studies to include larger and more diverse populations from multiple regions would enhance the external validity. Additionally, reliance on self-reported data may introduce biases; incorporating objective outcome measures, such as clinical indicators, could provide more reliable assessments. Finally, since this study only examined short-term effects, a long-term follow-up is necessary to determine the sustainability of these interventions.

Author Contributions

Conceptualization, E.S. and A.C.M.; methodology, E.S.; software, E.S.; validation, E.S. and A.C.M.; formal analysis, E.S.; investigation, E.S.; resources, E.S.; data curation, E.S.; writing—original draft preparation, all authors contributed equally; writing—review and editing, E.S. and A.C.M.; visualization, E.S.; supervision, A.C.M. and W.A.S.P.; project administration, E.S.; funding acquisition, A.C.M. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (Ethics Committee) of the Health Polytechnic of the Ministry of Health (Protocol Code DM.03.01/4.3/1001/2024), Sorong.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author due to privacy

and ethical restrictions.

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Conflicts of Interest

The authors declare no conflicts of interest.

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