

# THE KNOWLEDGE LEVEL OF INTERPROFESSIONAL COLLABORATION IN MEDICAL OFFICERS FOR MALNUTRITION PREVENTION

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## Abstract

**Background:** The effective management of highly intricate health issues requires the simultaneous involvement of various healthcare professions and a concerted collaborative effort. Among these health concerns, children's nutrition is highlighted as crucial for fostering the development of a high-quality generation. The use of a lecturing method in health education during training activities is anticipated to enhance the knowledge of medical officers in the realm of inter professional collaboration. **Aims:** The objective of this research was to evaluate alterations in knowledge levels regarding health interprofessional collaboration for the management of malnutrition before and after training. **Methods:** The research employed a quasi-experimental design with a pretest-posttest control group setup. Forty participants were chosen through the use of a stratified random sampling method, with 20 individuals allocated to the treatment group and another 20 to the control group. **Results:** The Friedman test in the treatment group resulted in a significance value of 0.000, indicating a substantial change in average knowledge levels before and after the module was administered. This difference was statistically significant in both the initial measurement, as well as in the comparisons between post-1 and post-2. In contrast, the control group showed a significance value of 0.055, implying no significant difference in average knowledge before and after the module was delivered. The Mann-Whitney score for the baseline knowledge was 0.170, suggesting that there was no significant difference in mean scores between the treatment and control groups. However, for post-1 knowledge, the significance was 0.002, indicating a significant mean difference in post-1 knowledge between the treatment and control groups. In contrast, post-2 knowledge had a significance of 0.075, suggesting no substantial mean difference between the treatment and control groups in post-2 knowledge. **Conclusion:** The findings suggest that

conducting health education through training modules leads to a modification in the knowledge levels concerning interprofessional collaboration among medical officers.

**Keywords:** Interprofessional Collaboration, Malnutrition, Officer Medical.

## 1. INTRODUCTION

Collaboration refers to a mutually beneficial and clearly defined relationship that is mutually agreed upon by two or more organizations to accomplish shared objectives (1). This is a broad term utilized across research, clinical practice, and health professional education, encompassing collaboration in almost every aspect of health (2). Addressing the most intricate challenges in the health sector necessitates a simultaneous resolution that involves the participation of all health professions (3). This is achieved by implementing preventive and promotive measures while also considering curative and rehabilitative approaches (4).

The advantages of interprofessional collaboration allow the participants to achieve more outcomes in a group than the outcomes they obtain individually, serving other people's bigger groups and growing from individual level to organizational level (2). Working together becomes a vital thing for individuals to achieve the interprofessional perspective and the benefits of working in a team and with clients (5). Interprofessional collaboration has positive effects on patient satisfaction, decreasing uncertainty, and improving hospitals (6). The practice of interprofessional collaboration is crucial for improving healthcare service outcomes in patients/clients and families (7). Healthcare services are strongly affected by the officers' knowledge; therefore, it can be said that the performance of the healthcare service system is strongly affected by the officers (8).

The consequences of ineffective team-work are that the patients suffer from an excessive procedure, miscommunication, and lacking coordination in servicing that cause patients to repeatedly complain about the service provider that does not coordinate the treatment (9), therefore, it leads them to the same information to the different medical team members (10). These days, many health systems in most countries in the world implement the fragmented healthcare service that eventually cannot solve the health issues in those countries (11).

Nutritional issues arise from various factors, ranging from intricate and complex ones. Numerous studies conducted by various institutions in several countries have led to the development of determinant models for understanding nutritional problems. This is related to different socio-culture in the society in each region (12). One of the problems that are emerged from undernutrition status is the condition that is less than maximum in the children's growth and development. To overcome nutritional problems, cross-sectoral actions are required (12).

Analysis of the nutritional status of under-five children, based on the weight-for-age index surpassing the MDGs target (15.5%), reveals that five regions, namely Pangkep (31.7%), Maros (31%), Takalar (29.6%), Makassar (29.6%), and Jeneponto (28.4%), exhibit a high percentage of combined malnutrition and undernutrition (15).

Globally, malnutrition conditions contribute to 45% of deaths in children under the age of five (13). Approximately 8 million Indonesian children, or one in three, experience suboptimal growth (14). Despite a 16.6% to 12.5% decrease in the proportion of impoverished individuals in Indonesia from 2007 to 2011, the nutritional issue did not exhibit a significant reduction (12). Analysis of the nutritional status of under-five

children, based on the weight-for-age index surpassing the MDGs target (15.5%), reveals that five regions, namely Pangkep (31.7%), Maros (31%), Takalar (29.6%), Makassar (29.6%), and Jeneponto (28.4%), exhibit a high percentage of combined malnutrition and undernutrition (15).

Utilizing data from the profile of the Provincial Health Office covering 24 regencies in South Sulawesi, it is observed that Jeneponto regency, comprising 11 subdistricts, houses 18 Public Health Centers distributed across its jurisdiction. These health centers are reportedly grappling with a nutritional challenge, contributing to a relatively high child mortality rate. In 2014, Jeneponto regency recorded an Infant Mortality Rate (AKB) of 10 per 1,000 live births, which increased to 12 per 1,000 live births in 2015 (Jeneponto BDK, 2015). The regency exhibited a moderate category for malnutrition and undernutrition at 26.4%, with a total of 7 cases (0.04%) falling under malnutrition (17).

Against this backdrop, the importance of intersectoral collaboration becomes evident as a key element for the success of health development, especially in the prevention of malnutrition in children. Hence, this research seeks to offer perspectives on the nutritional well-being of children and collaborative efforts among professionals. This will be explored through a case study conducted in three public health centers in Jeneponto Regency.

## 2. MATERIALS AND METHODS

The study utilized a "Quasi-Experiment" with a "pretest-posttest control group design" to examine different variables within the population, emphasizing the importance of gathering representative samples. (18).

The intervention group received both a module and training, while the control group only received a module. The training, facilitated by the researcher, spanned 2 days and covered materials on interprofessional collaboration. Participants in both groups were given modules on interprofessional collaboration in malnutrition prevention. The objective was to furnish information and scientific guidance on the topic to the training participants. Modules were distributed to participants before the training session. The collected data comprised quantitative measurements of knowledge on interprofessional collaboration taken before and after the training.

The instrument for measuring knowledge was made by researchers and has been tested for validity and reliability with the acquisition of Cronbach's alpha value = 0.761. The collaboration competency instrument uses a team performance checklist compiled by the main health team of the Ministry of Health and Long-term Care in Toronto, Canada in 2005. Bivariate test using Wilcoxon signed ranks test and Mann Whitney to test the treatment between groups.

This study was conducted in Jeneponto Regency, specifically in the Bonto Matene Public Health Center in the Turatea sub-district, the Arungkeke Public Health Center in the Arungkeke sub-district, and the Togo-Togo Public Health Center in the Batang sub-district, all of which comprised the treatment group. Additionally, the research covered the Binamu Public Health Center in the Binamu sub-district, the Tamalatea Public Health Center in the Tamalatea sub-district, and the Bontoramba Public Health Center in the Bontoramba sub-district. These locations were chosen due to the consideration that their work areas represent coastal areas, mountains, and urban regions. The total accessible population is 52, with a sample size of 42, selected

through stratified random sampling. Statistical analysis was performed using SPSS version 15.

Non-parametric statistics, specifically Chi-square, were applied when the data did not exhibit normal distribution to assess signs, symptoms, and ability before and after the intervention.

This research has passed the ethics committee at Hasanuddin University test with the ethics number: No.238. H4.8.4.5.31/PP36-KOMETIK/2017.

### 3. RESULTS

#### Univariate Analysis

Table 1 displays a p-value of 0.819 for age, 1.000 for both sex and education, and 0.978 for both work period and profession. The cumulative p-value exceeding 0.05 across the characteristics of respondents in the treatment and control groups suggests an absence of initial differences in the characteristics of respondents between the two groups.

**Table 1: An Analysis of the Characteristics of Medical Officers (Respondents) in Jeneponto Regency, 2017**

Characteristics	Treatment		Control		p-value
	Frequency	Percentage	Frequency	Percentage	
	n = 20	%	n = 20	%	
Age					
20 – 30 yo	10	50	14	70	0.819
31 – 40 yo	8	40	2	10	
41 – 50 yo	1	5	4	20	
51 – yo	1	5	0	0	
Sex					1.000
Male	3	15	3	15	
Female	17	85	17	85	
Education					1.000
S1	10	50	10	50	
Associate Degree	10	50	10	50	
Work Period					
1 – 5 years	8	40	11	55	0.978
6 – 10 years	4	20	4	20	
11 – 15 years	6	30	2	10	
16 – 20 years	2	10	2	10	
21 – 25 years	0	0	1	5	
Profession					
Doctor	2	10	0	0	0.978
Nurse	6	30	7	35	
Midwife	6	30	5	25	
Nutritionist	4	20	4	20	
Sanitarian	1	5	4	20	
Health Promotion Officer	1	5	0	0	

Source: Primary Data, 2017

Table 2 the data depicts that the average score variance in initial knowledge is 8.80, rising to 10.60 in the post-1 assessment and decreasing to 9.85 in the post-2 evaluation.

The Friedman test conducted in the treatment group resulted in a significant level of 0.000, suggesting no mean disparity in knowledge levels before and after health education using a lecturing method with modules during training.

To identify particular measurement stages with variations in mean scores, a Post-Hoc analysis employing the Wilcoxon test was performed.

**Table 2: The Mean Score of Changes in Interprofessional Collaboration Knowledge between Groups before and after the Health Education Intervention in Jeneponto Regency, 2017**

Groups	Initial Knowledge	Post-1 Knowledge	Post-2 Knowledge	Δ	p Value
	Mean	Mean	Mean		
Treatment (Training + Module)	8.80	10.60	9.85	1.05	0.000*
Control (Providing Module)	9.50	9.2	10.55	1.05	0.055*

Source: Primary Data, 2017

\* The Friedman test

\* The Wilcoxon test

Table 3 displays p-values for various comparisons: 0.001 for the initial measurement with post-1, 0.020 for the initial measurement with post-2, and 0.108 for the post-1 measurement with post-2.

Noteworthy measurement stages involve changes in knowledge for the initial measurement with post-1 and post-1 measurement with post-2.

In the control group, the difference in mean scores for initial knowledge was 9.50, decreasing to 9.2 in post-1 and increasing to 10.55 in post-2.

The Friedman test in the control group yielded a significance of 0.055, indicating no distinction in mean knowledge scores before and after health education through modules.

**Table 3: The Initial Measurement to Post-2 Measurement in the Respondents in Jeneponto Regency, 2017**

Measurement	n	P
Initial Knowledge & Post-1	20	0,001
Initial Knowledge & Post-2	20	0,020
Initial Knowledge & Post-3	20	0,108

Source: Primary Data, 2017

Wilcoxon Test

Table 4 compares the initial mean score of malnutrition knowledge, indicating 8.80 in the treatment group and 9.50 in the control group.

The Mann-Whitney test resulted in a score of 0.170, suggesting there is no significant difference in the mean score of initial knowledge between the treatment and control groups.

In post-1 knowledge, the treatment group scored 10.60, higher than the control group's 9.20. The Mann-Whitney test yielded a score of 0.002, indicating a significant difference in post-1 knowledge scores between the two groups.

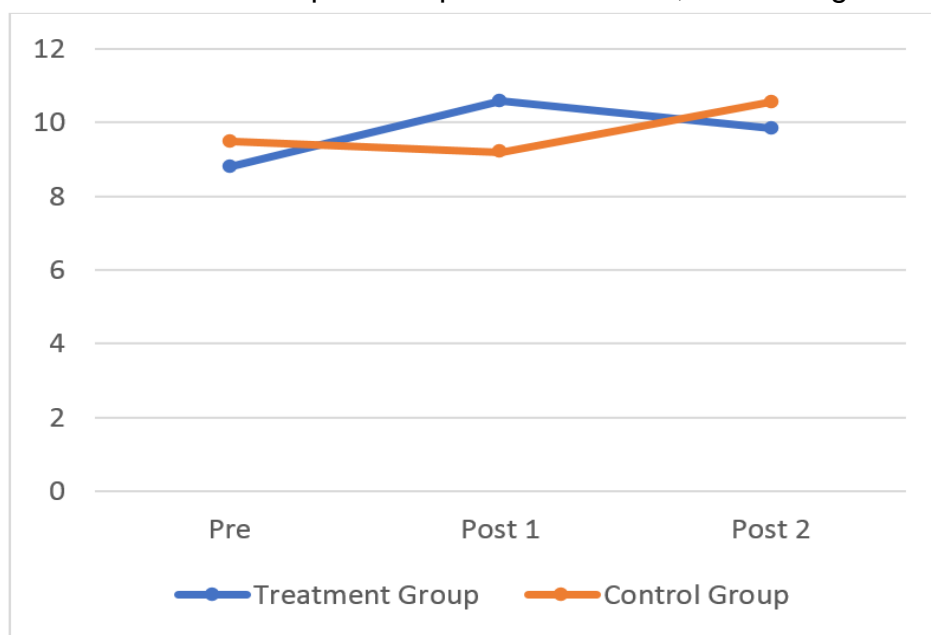
**Table 4: The Changes in Interprofessional Collaboration Knowledge Level between the Groups Before and After Giving Health Education in Jeneponto Regency, 2017**

Group	Initial Knowledge	Post-1 Knowledge	Post-2 Knowledge
	Mean	Mean	Mean
Treatment (Training + Modules)	8.80	10.60	9.85
Control (Providing Modules)	9.50	9.20	10.55

Source: Primary Data, 2017

The Mann-Whitney test

For post-2 measurement, the treatment group scored 9.85, lower than the control group's 10.55. The Mann-Whitney test resulted in a score of 0.075, suggesting no significant difference in post-2 knowledge between the treatment group (provided with training and modules) and the control group (only given modules). To facilitate the identification of differences in mean score changes in good knowledge on interprofessional collaboration pre- and post-intervention, refer to Figure 1.



**Figure 1: The Mean Score of Changes in Good Knowledge of Interprofessional Collaboration in the Pre- and Post-Intervention in the Treatment Group and Control Group**

#### 4. DISCUSSION

Nutritional challenges affect every stage of the human life cycle, encompassing the prenatal phase (fetus), infancy, childhood, adulthood, and elder years. The first two years of life are particularly critical due to the rapid growth and development that transpires during this period. Recognizing the significance of this phase, it is now acknowledged as the "first 1,000 days of life" program. The health of mothers significantly influences the birth of high-quality children, and various efforts have been undertaken since the prenatal stage to ensure the emergence of generations with optimal health (19). Government support during pregnancy includes initiatives like the

childbirth insurance program (20). Evaluating children's nutritional status requires adherence to accurate guidelines for nutritional status determination (21). The reality is that nutritional problems constitute a public health issue with multifactorial causes, necessitating a comprehensive approach and prevention efforts involving relevant sectors (22). Various factors, including breastfeeding patterns and weaning foods, significantly impact children's nutritional status (23). In Jeneponto Regency in 2013, the exclusive breastfeeding rate was 67.7%, falling below the national target of 80% (24). Parenting styles are also linked to the incidence of stunting in children aged 6 to 23 months in Makassar (25). Thus, a shared understanding of the definition, characteristics, and causative factors of nutritional issues, particularly malnutrition in children, is imperative among medical officers and society as a whole.

An individual's behavior is often positively influenced by the breadth of their knowledge (26). Acquiring knowledge is an ongoing process that requires continuous effort and evolves through reorganization resulting from new insights. According to constructivist views, knowledge is not merely a reflection of reality under study; rather, it represents an individual's cognitive construction of their objects, experiences, and environment. Health education is closely linked to knowledge and a comprehensive understanding of health (27). It serves as a vital mechanism for expanding one's knowledge and competencies, aimed at retaining facts and understanding real-life conditions. Encouraging self-direction and active participation in sharing information and ideas facilitates this process (28). Information, as highlighted by Notoatmojo, is recognized as a key factor influencing knowledge (29).

Table 2 shows that the treatment group produced a p-value of 0.007, signifying an observable distinction in knowledge levels before and after health education delivered through a lecturing method in the form of training. In contrast, the control group exhibited a p-value of 0.846, indicating no noteworthy difference in knowledge levels before and after health education, which involved reading modules distributed to the respondents. The Post-Hoc analysis conducted within the treatment group identified the stage from the initial measurement to the Post-1 measurement as the significant phase in knowledge level changes following health education with the lecturing method during the training.

This observation aligns with the perspective of David Kolb, as cited by the Indonesian Ministry of Health (2001), emphasizing that the time of acquiring an explanation significantly affects knowledge outcomes. In the treatment group, the post-1 measurement occurred immediately after the conclusion of the training activity, indicating that participants' knowledge levels were theoretically below 40–60%, as per David Kolb's concept of knowledge retention, where learned information tends to be forgotten over time.

In theory, it is recognized that acquired information contributes to knowledge, which can often be forgotten. There are various reasons why experiences may be challenging to recall; Purwanto (1990) suggests that individuals tend to forget observed details, including the situation, the observation process, and the timing. David Kolb, as cited in the Indonesian Ministry of Health (Depkes RI, 2001), highlighted that the retention of knowledge, as an outcome of the learning process, is significantly influenced by the timing of receiving the explanation. The term "collaboration" is widely employed in research, clinical practice, and medical professional education.(2). The concept of interprofessional working is not new, and

literature in medical science emphasizes the benefits and challenges of integrating workforces to understand and appreciate other professional cultures. In this study, healthcare practitioners exhibited a commendable comprehension of interprofessional collaboration.

Collaboration among professionals is not a recent concept. In the professional literature, particularly within medical science, it is evident that there are numerous advantages and challenges associated with integrating workforces, fostering learning, and cultivating an appreciation for diverse professional cultures. Once acquired, these skills can be applied across various domains, enabling individuals to collaborate with professionals from different fields to attain shared objectives (5). In this research, the medical officers demonstrated a strong comprehension of interprofessional collaboration. In the collective endeavors to prevent malnutrition, the visible expression of continuous medical interprofessional collaboration relies on consistent societal backing. Essential participants encompass the Health Office, Chief of Public Health Center, Sub-district Head, Village Head, women's community for family welfare empowerment (PKK), and public figures. The involvement of parents of children and support from surveillance officers are crucial elements deserving consideration. This corresponds to the idea of collaboration, underscoring cooperation among one or more public institutions actively involved in a formal collective decision-making process. (30).

Various forms of collaboration have been implemented in healthcare services within the community. This study has uncovered numerous activities that demonstrate interprofessional collaboration in daily healthcare services. Noteworthy activities include home visits aimed at directly monitoring the condition of children suffering from malnutrition, known as "Ammuntuli," which has emerged as an exemplary program in midwifery. Moreover, a referral system exists between healthcare practitioners and the functioning of integrated service posts within the community. This discovery corresponds with research carried out in the Netherlands, examining the partnership between village midwives and gynecologists. Both sectors serve as crucial foundations for enhancing collaboration in women's healthcare, showcasing differing degrees of collaboration intensity among healthcare professionals (1).

## 5. CONCLUSIONS

The findings of this study indicate that the combination of health education and modules delivered through training significantly impacts the knowledge levels of medical officers in Jeneponto Regency concerning nutrition and interprofessional collaboration. As a result, it is advised to conduct continuous and structured training activities to ensure effective implementation, aiming to enhance overall healthcare service quality and, more specifically, address malnutrition prevention.

### Authors Contribution

All authors contributed extensively to study implementation, monitoring the study progress, writing the original draft, and draft the manuscript. Muhammad Irwan, Irfan: Contacted respective authorities. Conceptualizing the study, study designing and was responsible for proofreading and critical revision of the content. Risnah, Maria Ulfah Azhar, Musdalifah: Sample collection, and sample processing. Kurnia Harli, Masniati: Statistical analysis, interpreted the data, data collection. Salmah Arafah: Managed study implementation and was responsible for proofreading and critical revision of the content. M. Alfian Rajab: Contacted respective authorities, editing draft. All authors read and approved the final manuscript.



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### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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