International Journal Of Health, Engineering And Technology (IJHET) *E-ISSN 2829 - 8683*
Volume 5, Number 2, July 2026, *Page. 1362 - 1369*
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Impact Of A *Transfer Of Knowledge And Skill* Based Intervention On Caregivers' Knowledge, Attitudes, And Practices In Badung Regency

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Abstract

Early childhood is a critical period characterized by rapid growth and development, requiring adequate nutritional intake and appropriate caregiving practices. This study aimed to examine the effectiveness of the Transfer of Knowledge and Skill (TKS) model in improving caregivers' knowledge, attitudes, and childcare practices related to nutrition. A quasi-experimental study was conducted from July to October 2025 in Canggu Village (North Kuta District) and Pererenan Village (Mengwi District). A total of 58 caregivers were divided into a control group receiving conventional caregiving and an intervention group receiving the Transfer of Knowledge and Skill model. Data were analyzed using independent samples t-tests for homogeneous data and Mann–Whitney tests for non-homogeneous data, with a significance level of $\alpha = 0.05$. The results showed greater improvements in the intervention group compared to the control group, particularly in knowledge (113.2% vs. 41.5%) and attitudes (66.6% vs. 9.9%). Positive caregiving practices increased in both groups by 13.3%. No significant differences were found between groups before the intervention; however, significant differences in knowledge, attitudes, and practices were observed after the intervention ($p < 0.05$). The Transfer of Knowledge and Skill model is recommended as an effective approach to improving nutrition-related caregiving practices and preventing stunting in early childhood.

Keywords: Attitude, Knowledge, Practice, TKS Model.

INTRODUCTION

Children are a vital asset as they determine the future of a nation. According to Statistics Indonesia (BPS) data in 2022, the number of early childhood and preschool-aged children in Indonesia was estimated at 30.73 million, accounting for 11.21% of the total population. Of this population, 58.78% were aged 1–4 years, 29.11% were aged 5–6 years, and 12.11% were under one year of age (Rizaty, 2022).

Growth and developmental problems among children under five years of age remain a significant public health issue in developing countries, including Indonesia. The prevalence of growth and developmental delays in Indonesia remains relatively high, with approximately 5–10% of children experiencing general developmental delays. The Indonesian Ministry of Health reported that around 0.4 million (16%) children under five experience developmental disorders, including delays in fine and gross motor skills, hearing impairment, intellectual disability, and speech delay (Sugeng, 2019).

Data from the Basic Health Research Survey (Riskesdas) and the Indonesian Nutritional Status Survey (SSGI) indicate that the nutritional status of Indonesian children under five still requires serious attention. Riskesdas data from 2013 to 2018 showed a reduction in stunting prevalence by 6.8% (from 37.6% to 30.8%), wasting by 1.9% (from 12.1% to 10.2%), underweight by 1.9% (from 19.6% to 17.7%), and overweight by 3.8% (from 11.8% to 8.0%). Meanwhile, SSGI data from 2021 to 2022 showed a decrease in stunting prevalence by 2.8% (from 24.4% to 21.6%). However, wasting and underweight increased by 0.6% (from 7.1% to 7.7%) and 0.1% (from 17.0% to 17.1%), respectively, while overweight decreased slightly by 0.3% (from 3.8% to 3.5%). In Bali Province, the prevalence of stunting based on Riskesdas 2018 was 21.8% (Bali Provincial Health Office, 2018). The SSGI 2022 results indicated that the prevalence of stunting in Bali Province was below the national average, at 8.0% (Kemenkes RI, 2022).

lthough stunting prevalence has declined nationally, the 2022 achievement remains far from the national target of 14% by 2024 (Perpres Nomor 72 Tahun 2021). To achieve this target, the government issued Presidential Regulation No. 72 of 2021 on the acceleration of stunting reduction

(Perpres Nomor 72 Tahun 2021). One of the national strategies outlined in this regulation is ensuring adequate nutritional intake and improving childcare practices.

To ensure adequate nutrition and appropriate childcare, various government sectors—including the Ministry of Health, local health offices, family planning agencies, and community empowerment institutions—have collaborated to provide education and training for parents on proper feeding practices and childcare. However, in practice, particularly in several villages in Badung Regency, many children are not exclusively cared for by their parents due to work obligations. Instead, they are often cared for by grandparents or paid caregivers who have never been exposed to health education or childcare training. As a result, these caregivers often lack adequate knowledge regarding appropriate feeding practices and proper childcare.

Based on these conditions, the researchers developed a *Transfer of Knowledge and Skill* (TKS) model for caregivers to ensure that children receive appropriate care, particularly in terms of meeting their nutritional needs. This model includes guidance on child feeding practices, such as appropriate portion sizes, types of food, meal timing, examples of nutritious menus along with preparation methods, and proper feeding techniques. The implementation of the model involved training sessions combined with hands-on food preparation practices. This training-with-practice approach is expected to improve caregivers' knowledge, attitudes, and practices in providing appropriate nutrition for children

RESEARCH METHODS

This study employed an experimental design using a pretest–posttest control group design and involved 58 participants assigned to a Control Group and an Intervention Group. Participants were randomly selected from two sub-districts in Badung Regency, Bali Province, Indonesia.

Participants

The inclusion criteria were as follows: child caregivers (grandparents or paid caregivers) residing in two sub-districts of Badung Regency; male or female aged 18–65 years; physically and mentally healthy; and willing to participate in the study, as indicated by signed informed consent.

The exclusion criteria included:

absence for two consecutive sessions during the study period; illness during the study; and withdrawal from the study for any reason.

Instruments

The instruments used in this study included: demographic data form to collect participants' background information; structured questionnaire assessing caregivers' knowledge, attitudes, and childcare practices; and caregiving model handbook focusing on child feeding practices

Intervention Materials

The intervention materials consisted of the *Transfer of Knowledge* caregiving model on child feeding practices and food models used as educational media. Data processing of caregivers' knowledge, attitudes, and practices regarding nutrition-related childcare in the Control and Intervention Groups was conducted as follows.

Knowledge Data

Caregivers' knowledge data were processed by dividing the score obtained by each participant by the maximum possible score and then multiplying the result by 100, using the following formula:

$$\frac{\text{Score obtained by the participant}}{\text{Maximum possible score}} \times 100$$

For descriptive data presentation, the scores were further categorized as follows: (Arikunto, 2019) :

Good: score of 76 – 100
Fair: score 56-75
Poor: score <56

Attitude Data

Attitude data were collected using a questionnaire based on a Likert scale with the following scoring system :

Positive statements		Negative statements	
SS (Strongly agree)	= skor 5	SS (Strongly agree)	= skor 1
S (Agree)	= skor 4	S (Agree)	= skor 2
N (Neutral)	= skor 3	N (Agree)	= skor 3
TS (Disagree)	= skor 2	TS (Disagree)	= skor 4
STS (Strongly disagree)	= skor 1	STS (Strongly disagree)	= skor 5

The total attitude scores of all participants were summed and divided by the number of participants to obtain the mean score. Each participant's score was then compared with the mean using the following criteria:

Positive attitude**:** participant's score ≥ mean score
Negative attitude: participant's score < mean score

Practice Data

Practice data regarding nutrition-related childcare were obtained using an observation checklist consisting of several items. Each correct practice was scored as 1, and each incorrect practice was scored as 0.

The total practice scores of all participants were summed and divided by the number of participants to obtain the mean score. Each participant's score was then compared with the mean using the following criteria:

Positive practice: participant's score ≥ mean score
Negative practice**:** participant's score < mean score

Statistical Analysis

Before conducting comparative analyses, data homogeneity was assessed using Levene's test at a significance level of $\alpha = 0.05$. For homogeneous data, parametric statistical analysis was performed using an independent samples *t*-test at $\alpha = 0.05$. For non-homogeneous data, non-parametric analysis was conducted using the Mann–Whitney test at $\alpha = 0.05$ to compare the Control and Intervention Groups.

RESULTS AND DISCUSSION

Results

Sample Characteristics

The participants in this study were parents and child caregivers (grandparents and paid caregivers) residing in Banjar Canggu, Canggu Village, North Kuta District, and Banjar Tiying Tutul, Pererenan Village, Mengwi District. Participants who met the inclusion criteria were randomly selected using a lottery method, resulting in a total sample of 58 participants, consisting of 26 individuals in the Control Group and 32 individuals in the Intervention Group.

The educational level of the participants is presented in Figure 1

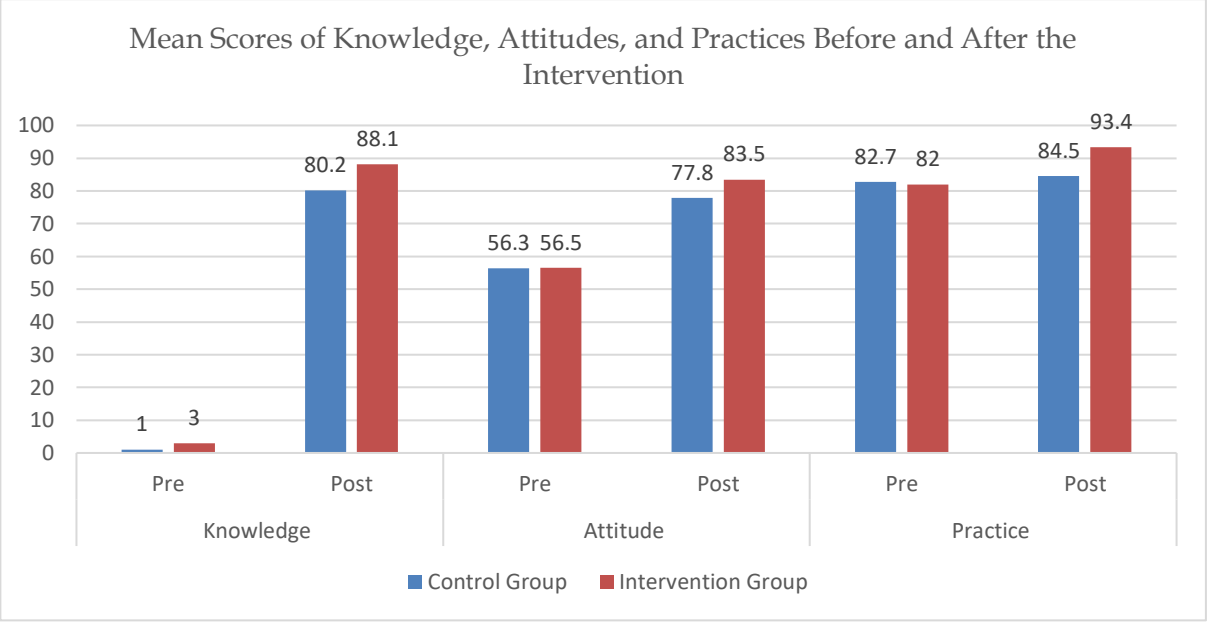

Figure 1 Educational Level of Participants

Figure 1 shows the sample characteristics based on educational level, with the majority of participants having completed senior high school or vocational high school (SMA/SMK). In the Control Group, 13 participants (50.0%) had a senior high school/vocational high school education, while in the Intervention Group, 14 participants (43.8%) were in this category. This was followed by participants with bachelor's degree and diploma-level education.

Knowledge, Attitudes, and Childcare Practices

The levels of caregivers' knowledge, attitudes, and childcare practices related to nutrition before the implementation of the model in the Control and Intervention Groups are presented in Figure 2.

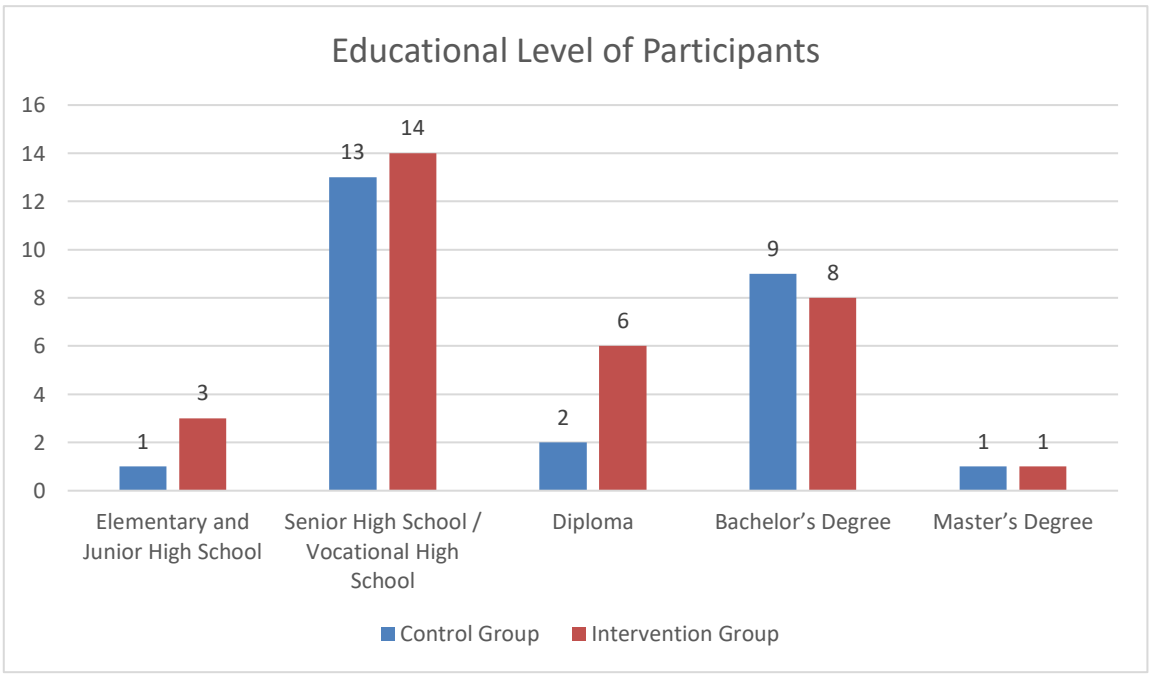

Figure 2 Mean Scores of Knowledge, Attitudes, and Practices Before and After the Intervention

Figure 2 shows that before the intervention, the mean knowledge scores in the Control and Intervention Groups were 73.1 and 71.9, respectively, both categorized as fair. The mean attitude scores were 56.3 in the Control Group and 56.5 in the Intervention Group. Meanwhile, the mean practice scores related to nutrition-related childcare (child feeding practices) were 82.7 in the Control Group and 82.0 in the Intervention Group.

After the intervention, an increase in mean knowledge scores was observed in the Control Group by 9.7% and in the Intervention Group by 22.5%. Mean attitude scores increased by 38.2% in the Control Group and by 47.8% in the Intervention Group. In addition, mean practice scores increased by 2.2% in the Control Group and by 13.9% in the Intervention Group.

The categories of caregivers' knowledge, attitudes, and nutrition-related childcare practices before and after the intervention in the Control and Intervention Groups are presented in Table 1.

Table 1
Categories of Caregivers' Knowledge, Attitudes, and Nutrition-Related Childcare Practices Before and After the Implementation of the Model in the Control and Intervention Groups

No	Katagori		Control Group				Intervention Group			
			Pre		Post		Pre		Post	
			n	%	n	%	n	%	n	%
1.	Knowledge	Good	12	46,2	17	65,4	15	46,9	32	100,0
		Fair	10	38,5	9	34,6	14	43,8	0	0
		Poor	4	15,4	0	0	3	9,4	0	0
		Total	26	100,0	26	100,0	32	100,0	32	100,0
2.	Attitude	Positive	10	38,5	11	42,3	15	46,9	25	78,1
		Negative	16	61,5	15	57,7	17	53,1	7	21,9
		Total	26	100,0	26	100,0	32	100,0	32	100,0
3.	Practices	Positive	15	57,7	17	65,4	15	46,9	17	53,1
		Negative	11	42,3	9	34,6	17	53,1	15	46,9
		Total	26	100,0	26	100,0	32	100,0	32	100,0

Table 1 shows an increase in the percentage of participants with good knowledge in the Control Group by 41.5% and in the Intervention Group by 113.2%. An increase in the percentage of positive attitudes was observed in the Control Group by 9.9% and in the Intervention Group by 66.6%. In addition, the percentage of positive practices increased by 13.3% in both the Control and Intervention Groups.

Data Analysis Results

Before selecting the appropriate comparative test, a homogeneity test was conducted on the knowledge, attitudes, and practices data of participants before and after the implementation of the model. The results are presented in Table 2.

Table 2
Homogeneity Test of Participants' Knowledge, Attitudes, and Practices in the Control and Intervention Groups Before and After the Implementation of the Model

No	Indicator		Control Group	Intervention Group	p*
			Mean	Mean	
1.	Knowledge	pre	73,1	71,9	0,532*
		post	80,2	88,1	0,353*
2.	Attitude	pre	56,3	56,5	0,073*
		post	77,8	83,5	0,000
3.	Practices	pre	82,7	82,0	0,996*
		post	84,5	93,4	0,333*

* The data were considered homogeneous if $p > 0.05$

Table 2 shows the homogeneity test results for participants' knowledge, attitudes, and practices in the Control and Intervention Groups before and after the implementation of the model. Using Levene's test at a significance level of $\alpha = 0.05$, the pre- and post-intervention knowledge data, pre-intervention attitude data, and pre- and post-intervention practice data were found to be homogeneous ($p > 0.05$). Therefore, further analysis was conducted using the independent samples *t*-test at $\alpha = 0.05$. Meanwhile, the post-intervention attitude data were not homogeneous ($p < 0.05$); therefore, the Mann–Whitney test was applied at $\alpha = 0.05$. The results of the comparative analysis are presented in Table 3.

Table 3
Results of Comparative Analysis of Participants' Knowledge, Attitudes, and Practices in the Control and Intervention Groups Before and After the Implementation of the Model

No	Indicator		Control Group	Intervention Group	t/Z	p
1.	Knowledge	pre	73,1	71,9	0,327	0,745
		post	80,2	88,1	-3,576	0,001
2.	Attitude	pre	56,3	56,5	-0,096	0,924
		post	77,8	83,5	-3,334	0,001
3.	Practices	pre	82,7	82,0	0,296	0,796
		post	84,5	93,4	-4,678	0,000

Table 3 shows that the mean knowledge, attitudes, and practices before the intervention in the Control and Intervention Groups had p-values > 0.05, indicating no significant differences between the groups. In contrast, after the intervention, the final knowledge, attitude, and practice data in the Control and Intervention Groups showed p-values < 0.05, indicating significant differences between the groups.

Discussion

The sample characteristics based on educational level showed that most participants had completed senior high school or vocational high school education, with 13 participants (50.0%) in the Control Group and 14 participants (43.8%) in the Intervention Group, followed by those with bachelor's degree and diploma-level education. Education is one of the internal factors that influence an individual's knowledge and abilities, particularly in relation to childcare practices such as preparing balanced and nutritious meals. Higher educational attainment is associated with broader knowledge and a greater ability to absorb new information or training provided. Knowledge does not develop spontaneously but is acquired through learning processes. The provision of knowledge is essential for improving individual quality and capacity, thereby enhancing the ability to perform specific tasks. Furthermore, an individual's level of knowledge influences behavior and actions; individuals with good knowledge tend to demonstrate better practices, whereas those with limited knowledge generally exhibit less optimal behavior (Prawita, 2018).

An increase in the percentage of participants with good knowledge was observed in the Control Group by 41.5% and in the Intervention Group by 113.2%. The percentage of participants with positive attitudes increased by 9.9% in the Control Group and by 66.6% in the Intervention Group. In addition, the percentage of positive practices increased by 13.3% in both the Control and Intervention Groups. The role of mothers or caregivers in caring for toddlers is a critical determinant of the quality of nutritional intake received by children. Mothers and caregivers need adequate knowledge regarding balanced nutrition in order to provide appropriate dietary intake, enabling children to grow healthily and develop according to their age (Kuswanti & Azzahra, 2022). Insufficient knowledge among mothers or caregivers can also influence their attitudes toward children. Limited knowledge may lead to negative attitudes in providing nutritional intake for toddlers, such as offering inappropriate food

sources or types of food. Consequently, caregivers' attitudes represent an important factor that may contribute to the risk of stunting in children.

Kuswanti and Azzahra (2022) examined the relationship between maternal nutritional knowledge and the nutritional status of toddlers and found a significant association between the level of nutritional knowledge and the nutritional status of children under five in Ngemplak Village, Karangpandan District, Karanganyar Regency. Niken (2021) also reported a significant association between mothers' knowledge of balanced nutrition and stunting prevention efforts among children aged 0–24 months, with a p-value of 0.000 ($p < 0.05$).

In the present study, the mean knowledge scores before the intervention in the Control and Intervention Groups showed no significant difference ($p > 0.05$). However, after the intervention, a significant difference was observed between the two groups ($p < 0.05$). These findings are consistent with the study by Imansari et.al, (2021), which demonstrated an increase in participants' knowledge scores following nutrition education in both the Control and Intervention Groups.

Another study that provided educational interventions and examined their impact on knowledge and attitudes found significant differences in knowledge and attitudes before and after stunting education. The study concluded that stunting education was effective in improving mothers' knowledge and attitudes in stunting prevention. Continuous efforts to provide sustained education are required to enhance mothers' understanding of stunting and its prevention, particularly regarding the provision of nutritious food ingredients (Trisnawati, 2022). Adequate nutritional knowledge and understanding among mothers or caregivers influence their attitudes toward food selection for toddlers. Consequently, nutrition-related childcare practices are likely to improve.

Regarding attitude data, the mean scores before the intervention in both the control and intervention groups showed no significant difference ($p > 0.05$). However, after the intervention, a significant difference was observed ($p < 0.05$). These findings are consistent with the study by Jumiyati et.al (2014) which reported that nutrition education interventions provided to health cadres significantly improved attitudes toward nutrition in the intervention group compared to the control group. Similarly Imansari et.al, (2021) found a significant difference in cadres' attitudes between the control and intervention groups following nutrition education. Attitude represents the progression of knowledge into readiness to act or behave. A positive outcome of the learning process is a change in the affective domain, reflected by increased awareness and the development of more positive attitudes toward the material being taught.

With respect to practice data, the mean scores prior to the intervention in both the control and intervention groups indicated no significant difference ($p > 0.05$). In contrast, after the intervention, a significant difference was identified ($p < 0.05$). These results are in line with the findings of Imansari et.al, (2021), who reported that nutrition education significantly improved nutrition counseling skills in the intervention group, with relatively higher improvements compared to the control group. The present findings are also consistent with the study by Jumiyati et.al, (2014) conducted in Bengkulu, which demonstrated an increase in cadres' counseling practices following cadre training using a structured module.

CONCLUSIONS

The results of this study indicate that the mean knowledge scores before the intervention in the control and intervention groups were 73.1 and 71.9, respectively. After the intervention, these scores increased to 80.2 in the control group and 88.1 in the intervention group. The mean attitude scores before the intervention were 56.3 in the control group and 56.5 in the intervention group, which increased to 77.8 and 83.5, respectively, after the intervention. Meanwhile, the mean practice scores related to nutrition-based child care (child feeding practices) before the intervention were 82.7 in the control group and 82.0 in the intervention group, and increased to 84.5 and 93.4, respectively, after the intervention. Statistical analysis showed a significant difference in knowledge, attitudes, and

practices between the control and intervention groups after the implementation of the *Transfer of Knowledge and Skill* model. These findings suggest that the intervention model was effective in improving caregivers' competencies in nutrition-based child care

Based on these findings, it is recommended that parents and caregivers of young children actively study and apply the educational modules and practical guidance provided. Continuous application of the acquired knowledge and skills is expected to improve attitudes toward nutrition-based child care and to sustain positive feeding practices as an effort to prevent stunting.

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