



POSTER EDUCATION ON TODDLER SPEECH LANGUAGE DISORDERS: MOTHERS' KNOWLEDGE AND ATTITUDE CHANGES

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ABSTRACT

Speech language disorders can affect children's communication, social interaction, and development. Mothers require adequate knowledge and positive attitudes to recognise warning signs and provide appropriate stimulation. To evaluate changes in mothers' knowledge and attitudes following poster based education about speech language disorders in toddlers and examine their associations with stimulation behaviour. This pre experimental study employed a one group pretest post test design. Using total sampling, 12 mothers of toddlers with speech language disorders were recruited from the Kedungmundu Community Health Centre area, Semarang. Participants received 15–20 minutes of face to face education using a poster covering definitions, warning signs, causes, and home based stimulation. Data were collected in November 2025 using questionnaires administered immediately before and after a 15–20-minute face to face educational session supported by a poster covering definitions, warning signs, causes, and home based stimulation. Changes were analysed using the Wilcoxon signed rank test, while associations with stimulation behaviour were examined using Spearman's rank correlation. Result: The proportion of mothers with good knowledge increased from 33.3% before education to 91.7% afterwards, while the proportion with a good attitude increased from 41.7% to 100%. Knowledge and attitude scores differed significantly between the pretest and post test assessments ($p < 0.05$). Neither knowledge ($r = 0.154$; $p = 0.624$) nor attitude ($r = 0.076$; $p = 0.815$) was significantly associated with stimulation behaviour. Poster based education was associated with improved maternal knowledge and attitudes regarding speech language disorders in toddlers.

Keywords: attitude; health education; knowledge; mother; speech language disorder; toddler

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INTRODUCTION

Speech and language disorders are among the most important developmental concerns in early childhood because they can affect communication, learning, behaviour, and social participation. Speech disorders involve difficulties in articulation, speech sounds, voice, or fluency, whereas language disorders affect the understanding or expression of language. Although some children with early delays may later develop age-appropriate abilities, persistent difficulties are associated with poorer literacy, educational attainment, employment, and independent living outcomes (Dubois et al., 2020; Feltner et al., 2024). A recent cohort study also found relatively low rates of natural catch-up among toddlers clinically identified with language delay, supporting early and individualised intervention rather than prolonged observation alone (Zhu et al., 2025). Developmental surveillance and timely assessment are therefore essential for recognising children who require further diagnostic evaluation and professional intervention (Feltner et al., 2024; Lipkin et al., 2020).

Parents have a central role because early language develops through repeated, responsive interactions during play, shared reading, and everyday caregiving. Conversational turn taking

during infancy predicts subsequent vocabulary growth (Donnelly & Kidd, 2021), while sustained parent child interaction has been associated with better language development at three and four years of age (Brushe et al., 2024). Conversely, greater screen exposure may reduce opportunities for adult speech, child vocalisation, and conversational exchange (Brushe et al., 2024; Madigan et al., 2020). Parental developmental knowledge and self-efficacy are also associated with the quality of early language interactions (Alper et al., 2021). However, parents do not always recognise age-inappropriate communication or understand its possible long term consequences (Mulderry et al., 2024). Evidence further indicates that responsive interaction and turn taking, rather than the quantity of parental speech alone, are more consistently associated with language outcomes among children with developmental language difficulties (Witteloostuijn et al., 2025). In Indonesia, inadequate home stimulation has also been associated with speech and language delay, indicating a need to strengthen caregiver education (Rosdiana, 2024).

Current strategies increasingly involve parents in interventions designed to improve developmental knowledge, caregiving practices, and parent child interaction. A global meta-analysis found that parenting interventions delivered during the first three years improved parenting knowledge, practices, interactions, and several child development outcomes (Jeong et al., 2021). Evidence specific to speech and language delay suggests that more intensive parent training programmes may improve expressive language, although findings vary according to programme duration and delivery (Feltner et al., 2024). For primary healthcare settings, posters offer an inexpensive and reusable method of presenting developmental milestones, warning signs, and stimulation guidance. Visual aids can improve comprehension and health-literacy outcomes, particularly when combined with clear verbal explanations (Galmarini et al., 2024; Mbanda et al., 2021). Health infographics have also shown potential to improve knowledge and attitudes, although many evaluations have methodological limitations (Kong et al., 2025). Similarly, brief parent-directed educational messages appear feasible, but their effects on sustained behavioural change require stronger evaluation (Simoncini et al., 2024).

In Indonesia, speech and language monitoring is incorporated into Stimulasi, Deteksi, dan Intervensi Dini Tumbuh Kembang (SDIDTK) within primary and community healthcare services (Ministry of Health Indonesia, 2024). Routine records from Kedungmundu Community Health Centre documented 27 children with developmental concerns during Januari until February 2025, of whom 25 had speech and language difficulties, including 12 toddlers. These figures represent service records rather than population prevalence, but they indicate a local need for accessible caregiver education. Despite growing evidence on intensive parent training and digital health communication, evidence remains limited regarding brief, face to face poster supported education for mothers already caring for toddlers with speech and language disorders in Indonesian primary healthcare settings. The contextual novelty of this study lies in evaluating a feasible, low resource educational strategy while examining both immediate changes in maternal knowledge and attitudes and their relationships with stimulation behaviour. Accordingly, this study aimed to assess changes in mothers' knowledge and attitudes following poster based education and to examine their correlations with speech and language stimulation behaviour.

METHOD

Study design and setting

This quantitative study employed a pre-experimental design with a one group pretest post-test approach. The study was conducted in the working area of Kedungmundu Community Health Centre, Semarang, Indonesia, in November 2025.

Participants and sampling

The study population comprised all mothers of toddlers with speech and language disorders in the working area of Kedungmundu Community Health Centre. Total sampling was used, resulting in a

sample of 12 mothers who met the study criteria.

Study variables

The independent variable was poster supported education about speech language disorders in toddlers. The dependent variables were maternal knowledge and attitudes, while maternal stimulation behaviour was assessed as an additional variable. Maternal knowledge was measured using the Knowledge of Infant Development Inventory (KIDI) and the scale showed strong concurrent validity ($r=0.908$) (Yilmaz Bursa, 2025). Maternal attitudes and stimulation behaviour were assessed using structured questionnaires. The knowledge and attitude questionnaires were administered immediately before and after the educational intervention.

Educational intervention and data collection

Before data collection, participants received an explanation of the study objectives and provided informed consent. Participants then completed a pretest questionnaire to assess their initial knowledge and attitudes regarding speech and language disorders in toddlers. The participants subsequently received face to face education using a poster. The educational material covered the definition of speech and language disorders, warning signs or *red flags*, contributing factors, and stimulation activities that parents could perform at home. The researcher emphasised the key messages presented in the poster during a 15–20-minute educational session. Immediately after the educational session, participants completed the same questionnaire as a post test to assess changes in their knowledge and attitudes.

Statistical analysis

Data were analysed using IBM SPSS Statistics version 30.0. Participant characteristics, knowledge, attitudes, and stimulation behaviour were summarised using frequencies and percentages. Given the small sample size and non normal data distribution, differences in knowledge and attitude scores before and after the educational intervention were analysed using the Wilcoxon signed-rank test. Spearman's rank correlation test was used to examine the relationships between maternal knowledge and speech and language stimulation behaviour and between maternal attitude and stimulation behaviour. Statistical significance was set at $p<0.05$.

Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee before participant recruitment and data collection (approval number: 92/KEPK.EC/X/2025). All participants received information about the study and provided informed consent before participation. Participant identities and personal information were kept confidential throughout the study.

RESULT

Table 1.
Participant characteristics and baseline stimulation behaviour (n=12)

Characteristics	f	%
Age (years)		
25 – 30	5	41.7
30 – 35	6	50.0
36 - 40	1	8.3
Educational attainment		
Junior high school	3	25.0
Senior high school	6	50.0
Bachelor's degree	3	25.0
Occupation		
Labourer	5	50.0
Homemaker	1	41.7
Private sector employee	2	8.3
Stimulation behaviour		
Active (≥ 20)	2	16.7
Less active (< 20)	10	83.3

As shown in Table 1, half of the participants were aged 30–35 years (50.0%) and had completed senior high school (50.0%). Most participants worked as labourers (50.0%) or homemakers (41.7%). At baseline, 83.3% demonstrated less active speech and language stimulation behaviour.

Table 2 shows that the proportion of mothers with good knowledge increased from 33.3% before the intervention to 91.7% afterwards. The proportion with good attitudes also increased from 41.7% to 100.0%. Differences in both knowledge and attitudes between the pre-intervention and post-intervention assessments were statistically significant ($p=0.008$).

Table 2.

Maternal knowledge and attitudes before and after poster based education (n=12)

Variable	Category	Pre-intervention, f (%)	Post-intervention, f (%)	p-value*
Knowledge	Good (5–7)	4 (33.3)	11 (91.7)	0.008
	Poor (0–4)	8 (66.7)	1 (8.3)	
Attitude	Good (37–48)	5 (41.7)	12 (100.0)	0.008
	Moderate (25–36)	7 (58.3)	0 (0.0)	
	Poor (12–24)	0 (0.0)	0 (0.0)	

* p -values were obtained using the Wilcoxon signed-rank test. Statistical significance was set at $p<0.05$.

As presented in Table 3, maternal knowledge and attitudes had very weak positive correlations with stimulation behaviour. However, neither maternal knowledge ($\rho=0.158$; $p=0.624$) nor maternal attitude ($\rho=0.076$; $p=0.815$) was significantly correlated with stimulation behaviour.

Table 3.

Correlations of maternal knowledge and attitudes with stimulation behaviour (n=12)

Variable	Spearman's ρ	p-value
Maternal knowledge	0.158	0.624
Maternal attitude	0.076	0.815

DISCUSSION

This study found that a brief poster-based educational session was followed by significant improvements in mothers' knowledge and attitudes regarding speech and language disorders in toddlers. Before the intervention, most participants had limited knowledge, whereas almost all were classified as having good knowledge afterwards. All participants also demonstrated a good attitude following the intervention. However, neither knowledge nor attitude was significantly correlated with speech and language stimulation behaviour.

The improvement in knowledge suggests that the poster helped mothers understand the definition, warning signs, contributing factors, and appropriate stimulation for speech and language disorders. Visual materials can organise complex health information into concise messages that are easier to understand and remember. A systematic review and meta-analysis found that visual based interventions improved health-information comprehension compared with conventional written materials (Galmarini et al., 2024). Nevertheless, the improvement observed in this study may also have resulted from the educator's face to face explanation because the poster was not used independently. The findings should therefore be attributed to poster supported education rather than to the poster alone.

The improvement in maternal attitudes indicates that the educational session may have increased mothers' awareness of the importance of early recognition and appropriate stimulation. Parents may observe their children's communication abilities but not always recognise whether these abilities are developmentally appropriate. Mulderry et al. (2024) found that some parents remained unconcerned even when their children's communication skills did not meet developmental expectations, supporting the need for clear public-health messages about language milestones and warning signs. Providing understandable information may correct the assumption that all speech difficulties will

resolve without assessment.

Despite these improvements, knowledge and attitude were not significantly correlated with stimulation behaviour. This finding indicates that possessing information or expressing a positive attitude may not be sufficient to change everyday parenting practices. Behaviour may also be influenced by time, confidence, communication skills, family support, competing responsibilities, and access to professional guidance. Furthermore, stimulation behaviour was assessed without a follow-up period, while the post test was administered immediately after education. Participants consequently had no opportunity to apply the recommended activities before the assessment. The small sample also provided limited statistical power to detect correlations. Therefore, the non significant findings should not be interpreted as evidence that maternal knowledge and attitudes are unimportant.

Recent evidence emphasises that the quality of parent child interaction is more important than simply increasing the amount of speech directed towards a child. Responsive behaviours, turn taking, following the child's interests, and joint engagement are positively associated with language outcomes among children with developmental language difficulties (Witteloostuijn et al., 2025). Community nurses should therefore combine posters with demonstrations, guided practice, and feedback on specific stimulation techniques. A single educational session may improve immediate understanding, but more sustained parent training may be required to change behaviour. A recent evidence review found that parental training programmes showing benefits for children's expressive language generally involved multiple sessions rather than one brief exposure (Feltner et al., 2024; Witteloostuijn et al., 2025).

This study has several limitations. Its one group design cannot distinguish the intervention related change from testing effects, participant expectations, or other influences. The sample was small and recruited from one community health centre area, limiting generalisability. The immediate post-test assessed short term change but not knowledge retention or subsequent behavioural change. Self-reported stimulation behaviour may also have been affected by recall or social desirability bias. In addition, the study did not assess changes in children's speech or language outcomes. Nevertheless, the study provides preliminary evidence that brief poster supported education is feasible and may strengthen maternal knowledge and attitudes in a community setting. Future controlled studies should include larger samples, delayed follow-up assessments, direct observation of parent child interaction, and child development outcomes.

CONCLUSION

Brief poster supported education was associated with improved maternal knowledge and attitudes regarding speech language disorders in toddlers. However, maternal knowledge and attitudes were not significantly correlated with stimulation behaviour.

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