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Adolescent Health Cadre Behaviour Regarding Stunting Prevention Based on the Health Promotion Model and Theory of Reasoned Action

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ABSTRACT

Background: Stunting is a condition of growth failure in children due to chronic malnutrition, especially in the first thousand days of life. **Object:** The purpose of this study was to prove that the development of the Health Promotion Model (HPM) and the Theory of Reasoned Action (TRA) had an effect on the behavior of adolescent health cadres in preventing stunting. **Method:** Type of quasi-experimental design with a Non-Equivalent control group pre-test post-test design of TPB in improving the behavior of Posyandu cadres in stunting prevention. The study population consisted of 400 Posyandu Youth health cadres from Panekan sub-districts, Magetan Regency, Indonesia. A total of 200 respondents were selected using a simple random sampling technique and assigned to two groups: intervention (n = 100) and control (n = 100). Variables measured included perceived susceptibility, perceived benefits, attitudes, intentions, subjective norms, and preventive behaviors. Data were collected using a validated and reliable Likert-scale questionnaire. Data analysis employed paired samples t-test for within-group comparisons and independent samples t-test for between-group comparisons at a 0.05 significance level. **Results:** Perceived benefit of action, Perceived barrier of action, Perceived self-efficacy, Activity related affect, Interpersonal influences, Situation influences, Immediate competing demands and preferences, Commitment to a plan of action, Health promoting behavior influence the behavior of adolescent health cadres in stunting preventing behavior. **Conclusion:** The development of the HPM, and TRA influence the behavior of adolescent health cadres in preventing stunting.

Keywords: Health Promotion Model, Theory of Reasoned Action, Youth Health Cadres, Stunting Prevention, Behavior Change

BACKGROUND

Stunting is a condition in which a toddler has a length or height that is less than minus two standard deviations from the median of the WHO child growth standards. Stunting is caused by insufficient nutritional intake over a long period of time due to inadequate feeding (Gamboa et al., 2020; Marlina et al., 2022). Stunting can occur while the fetus is still in the womb and only becomes apparent when the child is two years old. Stunting is a condition of failure to thrive in toddlers due to chronic malnutrition, especially

during the first 1,000 days of life (HPK) (Kumanireng & Triputro). This failure to thrive in toddlers is caused by a lack of nutritional intake over a long period of time and repeated infections, both of which are influenced by inadequate parenting, especially during the first 1,000 days of life (HPK).

A child is classified as stunted if their length or height for their age is lower than the applicable national standards. These standards are found in the Maternal and Child Health book and several other

documents (Putri & Sudiyat, 2021). The 2018 Basic Health Research (Riskesdas) found that 30.8% of children experienced stunting. Although the prevalence of stunting decreased from 37.2% in 2020, the stunting rate remains high and there are still 2 (two) provinces with a prevalence above 40% (Kemenkes RI, 2018; K. R. Kesehatan Badan Penelitian dan Pengembangan Kesehatan Puslitbang Humaniora dan Manajemen Kesehatan, 2018). In accordance with the Decree of the Regent of Magetan Number 188/132/Kept/403.013/2022 concerning the Determination of Priority Village Locations for the Acceleration of Stunting Prevention in 2023. In Magetan Regency there are still 27 stunting locus villages spread across 8 sub-districts (Magetan, 2022; Dinkes Magetan, 2022).

In Indonesia, stunting prevalence remains high at 30.8%, or approximately seven million children under five. Magetan Regency reported a prevalence of severe malnutrition among under-five children of 0.96% in 2018, with Panekan Sub-district contributing 4% of the total cases. The low household coverage of Clean and Healthy Lifestyle Behavior (PHBS) at 46% (national standard 60%) indicates the need for a community-based approach to promote behavioral change for stunting prevention (Kemenkes RI, 2022).

The Health Promotion Model (HPM), developed by Nola J. Pender, emphasizes the importance of individual factors such as perceived benefits, barriers, self-efficacy, and environmental influences in promoting healthy behaviors. This model is highly relevant in encouraging mothers or caregivers to adopt good nutrition and health practices, such as exclusive breastfeeding, monitoring child growth and development, and meeting balanced nutritional needs (Pender N., 2011; Handayani et al., 2019).

Meanwhile, the Theory of Reasoned Action (TRA) explains that an individual's intention to perform a behavior is strongly influenced by

attitudes toward that behavior and subjective norms. In the context of stunting prevention, the TRA can help explain how community attitudes toward child feeding practices, as well as social influences from family or community leaders, can influence a mother's decision to provide appropriate nutrition to her child (Sheppard et al., 1988; Carter et al., 2006).

By combining the approaches of the HPM and TRA, stunting prevention programs can be designed more comprehensively, targeting not only knowledge and skills but also psychosocial and cultural factors that influence health behaviors[14]. Therefore, the use of both models is crucial for designing effective, sustainable interventions based on a deep understanding of behavior. Furthermore, this research not only assesses knowledge levels but also measures changes in risk perception, intention, subjective norms, and behavioral control, providing comprehensive empirical evidence on the effectiveness of behavioral models in community empowerment in rural settings. This study enriches global literature by offering a dual-theory approach to community-based empowerment for child nutrition issues, which has predominantly been applied in the prevention of non-communicable diseases (Madden et al., 1992).

RESEARCH METHODS

Materials and Method

Type of quasi-experimental design with a Non-Equivalent control group pre-test post-test design of TPB in improving the behavior of Posyandu cadres in stunting prevention.

Description of Materials or Research Subjects

The study population comprised all Posyandu cadres willing to participate in Ngiliran and Tapak sub-districts, totaling 400 individuals. Inclusion criteria included: (1) willingness to participate, (2)

cooperative attitude, and (3) residence within the study area. The sample was selected using simple random sampling (Sheppard et al., 1988), resulting in 200 respondents, divided into an intervention group (n = 100) and a control group (n = 100).

Research Design

This study employed a quasi-experimental design with a non-equivalent control group pretest-posttest approach (Suharto et al., 2022; Elisanti et al., 2019). This design was chosen to evaluate the effectiveness of a community empowerment model based on the Health Promotion Model (HPM) and the Theory of Reasoned Action (TRA) in improving the preventive behaviors of youth health cadres against stunting. Both intervention and control groups underwent baseline measurements (pretest) before the intervention, followed by the intervention applied only to the intervention group, and final measurements (posttest) conducted one month after the intervention (Nursalam, 2014).

Research Procedure

The research was conducted in Magetan Regency, East Java Province, Indonesia. The intervention group was located in Ngiliran-Panekan Sub-district, while the control group was in Tapak-Panekan Sub-district. The study was carried out from January to September 2025.

Instruments and Equipment

Instrument a structured questionnaire measuring youth health behaviors toward stunting prevention, developed based on

HPM and TRA indicators. The instrument had been previously tested for validity and reliability.

Data Collection Methods

Data were collected using a structured questionnaire measuring youth health behaviors toward stunting prevention, developed based on HPM and TRA indicators.

Data Analysis

Data analysis included descriptive statistics to summarize respondents' characteristics and inferential analysis using independent samples t-test to assess the effectiveness of the intervention between groups. Statistical significance was set at $p < 0.05$ (Machali, 2015; Basuki, 2014).

Research Ethic

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya, Indonesia (Approval No.:EA/3497/KEPK-Poltekkes_Sby/V/2025, June 25, 2025). Informed consent was obtained from all participants prior to data collection, and confidentiality of the participants' information was strictly maintained throughout the study.

RESULT AND DISCUSSION

Comparative Data of Pretest and Posttest in Groups

Table 1.

Comparison of Pretest and Posttest Scores within Intervention and Control Groups

Variable	Group	Pretest Mean (SD)	Posttest Mean (SD)	p-value (Paired t-test)
Prior related behavior	Intervention	10.00 (0.96)	21.85 (2.05)	< 0.001
	Control	11.95 (0.95)	16.47 (1.49)	< 0.001
Personal factors	Intervention	11.06 (0.97)	23.83 (2.01)	< 0.001
	Control	10.97 (0.95)	16.62 (1.53)	< 0.001
Perceived benefit of action	Intervention	11.06 (0.97)	21.05 (1.82)	< 0.001
	Control	13.06 (0.95)	17.45 (1.53)	< 0.001
Perceived self efficacy	Intervention	13.09 (1.01)	21.05 (1.84)	< 0.001
	Control	11.10 (1.00)	16.75 (1.74)	< 0.001
Activity related affect	Intervention	12.05 (1.04)	21.92 (1.86)	< 0.001
	Control	11.08 (1.00)	17.08 (2.02)	< 0.001
Interpersonal influences (family, peers, providers, norms, support, model)	Intervention	12.15 (1.08)	21.15 (1.97)	< 0.001
	Control	12.13 (0.97)	17.24 (1.97)	< 0.001
Situation influences (option demand, characteristic aesthetic)	Intervention	13.04 (0.99)	21.87 (1.95)	< 0.001
	Control	10.05 (0.97)	16.35 (1.40)	< 0.001

Variable	Group	Pretest Mean (SD)	Posttest Mean (SD)	p-value (Paired t-test)
Immediates competing demands (low control) and preferences (High control)	Intervention	13.08 (1.04)	21.91 (1.94)	< 0.001
	Control	12.01 (0.96)	16.27 (1.59)	< 0.001
Comittment to a plan of action (Pencegahan stunting), Health promoting behavior	Intervention	12.19 (1.09)	22.96 (1.88)	< 0.001
	Control	12.91 (0.91)	16.35 (1.42)	< 0.001
Behavior beliefs	Intervention	13.15 (1.15)	21.10 (1.90)	< 0.001
	Control	12.15 (0.99)	17.58 (1.56)	< 0.001
Outcomes evaluation	Intervention	12.30 (1.13)	21.08 (1.84)	< 0.001
	Control	11.17 (1.02)	16.61 (1.63)	< 0.001
Motivation beliefs	Intervention	13.02 (1.05)	21.99 (1.85)	< 0.001
	Control	10.18 (1.15)	16.85 (1.89)	< 0.001

The respondents of this study were pregnant women residing in the working areas of Mojo Public Health Center, Mulyorejo Public Health Center, Sidotopo Wetan Public Health Center, and Tanah Kali Kedinding Public Health Center. The

results showed that most respondents (71%) were aged 20–30 years. More than half of the respondents (50.5%) had secondary education, and 57% were unemployed.

Inter-Group Comparison Data on Posttest

Table 2.

Comparison of Posttest Scores Between Intervention and Control Groups

Variable	Intervention Group (n=100) Mean (SD)	Control Group (n=100) Mean (SD)	p-value (Independent t-test)
Prior related behavior	21.85 (2.05)	16.47 (1.49)	< 0.001
Personal factors	23.83 (2.01)	16.62 (1.53)	< 0.001
Perceived benefit of action	21.05 (1.82)	17.45 (1.53)	< 0.001
Perceived self efficacy	21.05 (1.84)	16.75 (1.74)	< 0.001
Activity related affect	21.92 (1.86)	17.08 (2.02)	< 0.001
Interpersonal influences (family, peers, providers, norms, support, model)	21.15 (1.97)	17.24 (1.97)	< 0.001
Situation influences (option demand, characteristic aesthetic)	21.87 (1.95)	16.35 (1.40)	< 0.001
Immediates competing demands (low control) and preferences (High control)	21.91 (1.94)	16.27 (1.59)	< 0.001
Comittment to a plan of action (Pencegahan stunting), Health promoting behavior	22.96 (1.88)	16.35 (1.42)	< 0.001
Behavior beliefs	21.10 (1.90)	17.58 (1.56)	< 0.001
Outcomes evaluation	21.08 (1.84)	16.61 (1.63)	< 0.001
Motivation beliefs	21.99 (1.85)	16.85 (1.89)	< 0.001

Table 2 presents the comparison of posttest scores between the intervention and control groups, showing that the independent samples t-test results indicated significant differences ($p < 0.001$) across all variables between the two groups after the intervention. The intervention group had considerably higher posttest mean scores compared to the control group. These differences suggest that training based on the Health

Promotion Model (HPM) and Theory of Reasoned Action (TRA) significantly improved the cognitive and behavioral components of *youth health cadres* in stunting prevention compared to conventional approaches.

Discussion

Comparison of Pretest and Posttest Scores Within Groups

The results of the comparison between pretest and posttest scores within groups, as shown in Table 2, demonstrate that the intervention based on the Health Promotion Model and Theory of Reasoned Action significantly improved scores across all behavioral variables among youth health cadres ($p < 0.001$), including perceived symptoms, perceived benefits, attitudes, intentions, and subjective norms. For instance, the preventive behavior score increased from The mean preventive behavior score increased from 12.15 (SD = 1.06) at pretest to 22.13 (SD = 1.87) at posttest.

These findings align with previous studies indicating that strengthening elements of risk perception and self-efficacy significantly influences stunting prevention behaviors. The development of a health promotion model and theory of reasoned action (HPM) is effective in improving stunting prevention behavior among adolescent health cadres. HPM focuses on how personal factors (knowledge, experience), perceived benefits/barriers, self-efficacy, and interpersonal/situational influences influence health behavior.

Adolescent cadres as promotive agents can be motivated through training, education, peer support, practical examples, and resources. TRA emphasizes that cadres' attitudes toward preventive measures, subjective norms (how important people such as teachers, health workers, and family perceive them), and intentions will be strong predictors of whether they will engage in promotive/preventive behaviors against stunting (e.g., community education, early detection, and referral of infants with risk indications). Therefore, developing an intervention model that combines elements of HPM and TRA for adolescent cadres is a logical strategy: strengthening attitudes, norms, self-efficacy, action plans,

reducing barriers, and environmental support (Purnamasari et al., 2024).

Continuous training and education for health cadres (including adolescent cadres) increases their self-efficacy in implementing preventive measures, such as nutrition communication, growth and development monitoring, and healthy lifestyle counseling. Fishbein and Ajzen (the creators of TRA) stated that for behavior change, information alone is not enough; it requires the formation of social norms and strong motivation (intention). Adolescent cadres can be intermediaries for positive social norms in their communities. Nola Pender (the developer of HPM) emphasized that related prior behavior and situational influences are crucial, as cadre experience, facilities, and institutional support significantly influence the implementation of promotive behavior, the behavioral changes observed can be attributed primarily to the intervention rather than to demographic differences (Pender, 2011; Kodish et al., 2015).

Although the control group exhibited slight improvements in some indicators, these were substantially lower compared to the intervention group. This suggests that passive observation or routine posyandu interactions provided minimal learning benefits. Conversely, structured, theory-driven interventions through active engagement proved far more effective in shaping understanding and fostering motivation for behavioral change (Noviana et al., 2024).

These findings reaffirm that empowering Posyandu cadres through interventions grounded in behavioral theories significantly enhances their ability to act effectively and sustainably. Existing literature also highlights that theory-based training such as HPM and TRA can substantially improve health knowledge and behaviors. A regional study by Suharto (2025) in East Java similarly demonstrated that community empowerment programs based on HPM

and TRA significantly improved stunting prevention behaviors (Suharto et al., 2020).

Overall, these findings provide strong empirical evidence that structured interventions integrating HPM and TRA should be widely adopted within national youth health cadres empowerment programs. This combined model not only enhances knowledge and intention but also brings about tangible behavioral changes in stunting prevention. Future implementation should prioritize sustainability through continuous training, social support systems, and the reinforcement of community norms as key enabling factors.

Comparison of Posttest Scores Between Intervention and Control Groups

The results presented in Table 3 indicate a significant difference across all behavioral and cognitive variables between the intervention and control groups following the training based on the Health Promotion Model (HPM) and the Theory of Reasoned Action (TRA) ($p < 0.001$). These findings align with global studies affirming the effectiveness of HPM and TRA in enhancing adherence to health behaviors. These findings support the extensive global literature that has demonstrated that the HPM and TRA are effective theoretical approaches for guiding health behavior change. Several previous studies, such as those conducted by Pender (2011) in the development of the HPM, demonstrated that factors such as perceived benefits, barriers, and self-efficacy strongly influence individuals' intentions and actions in maintaining health. Similarly, Ajzen and Fishbein (1980) in their TRA model explained that behavioral intentions, influenced by attitudes toward the behavior and subjective norms, are key predictors of actual action (Srof & Velsor-Friedrich, 2006).

Other studies by Aghamolaei et al. (2014) and Shafiei et al. (2017) also

demonstrated that HPM- and TRA-based interventions significantly increased adherence to preventive behaviors, such as regular health checkups, physical activity, and hygiene practices. The consistency between the findings of this study and previous studies strengthens the validity of using these models in public health interventions (Hearawati & Sunjaya, 2022).

The Health Promotion Model (HPM), developed by Nola J. Pender, emphasizes that health behavior is influenced by previous experiences, individual characteristics, and perceptions of the benefits and barriers to health behavior, including perceived self-efficacy and social support (Heydari & Khorashadizadeh, 2014). In the context of this study, interventions based on the HPM proved effective in increasing participants' perceptions of the benefits of engaging in healthy behaviors and reducing perceived barriers to behavior change. Heydari et al. found that implementing the HPM in a health intervention for adolescents significantly increased preventive behaviors against infectious diseases. Mohammadi Zeidi et al. also concluded that using the HPM to promote exercise behavior in adult women significantly increased self-efficacy and motivation to exercise (Heydari & Khorashadizadeh, 2014).

TRA, developed by Ajzen and Fishbein, states that behavioral intentions are a direct predictor of actual actions. These intentions are formed from attitudes toward the behavior and subjective norms, namely the perceived social influence on a particular behavior. In this intervention, a TRA-based approach successfully enhanced cognitive components (such as intentions and attitudes), which ultimately impacted participants' actual behaviour (Trafimow, 2009). Armitage & Conner, in a meta-analysis of TRA, concluded that this model explained approximately 27% of the variance in behavior and 39% of the variance in behavioral intentions,

indicating its high predictive power. Shafiei et al. demonstrated that a TRA-based intervention among women of childbearing age successfully increased cervical cancer screening behavior by increasing positive attitudes and subjective norms. Montano & Kasprzyk also emphasized that TRA is well-suited for use in the context of voluntary behaviors that require conscious decision-making, such as adherence to health recommendations (Shimp & Kavas, 2984; Al-Barwani, 2017).

These findings strengthen the evidence that systematic, theory-based interventions can effectively promote sustainable health behaviors. The application of HPM and TRA not only provides a strong conceptual framework but also guides the design of intervention programs to be more targeted, measurable, and efficient (Hall et al., 2018). This is particularly relevant in the context of public health promotion, health education, and disease prevention programs. Furthermore, statistical significance ($p < 0.001$) indicates that these results are not due to chance but rather reflect the true effects of the intervention. This means that HPM and TRA-based programs can be recommended for wider implementation in various settings, such as schools, communities, healthcare facilities, and even through digital platforms (Mahyarni, 2013 & Suharto, 2022).

Research limitations:

In experimental research, the lack of proper control over external variables (confounding variables) can reduce internal validity, which is the ability to ensure that research results are truly caused by the variables being tested. Without control, conclusions drawn can be influenced by other factors not considered. Future research could use more controlled experimental designs, such as creating a control group or using a double-blind design to reduce researcher or participant

bias. This design can help improve internal validity.

CONCLUSION

This study demonstrated that the application of the Health Promotion Model (HPM) and Theory of Reasoned Action (TRA)-based interventions were proven effective in improving cognitive and behavioral health outcomes in the intervention group compared to the control group. There were statistically significant differences ($p < 0.001$) in all measured variables, including knowledge, attitudes, intentions, and actual actions in implementing health behaviors. These results indicate that a theory-based approach can change the determinants of behavior by increasing perceived benefits, strengthening intentions, changing subjective norms, and enhancing self-efficacy. These findings are also consistent with various international studies that indicate that HPM- and TRA-based interventions have a strong theoretical basis and are applicable for modifying health behaviors sustainably. Therefore, this approach can serve as a basis for developing more systematic, evidence-based health promotion programs oriented toward long-term behavior change.

SUGGESTIONS

Application of Theoretical Models in Health Programs: It is recommended that health agencies, educators, and policymakers apply the HPM and TRA models more broadly in designing health behavior interventions, both at the community, school, and health care facility levels. Strengthening HPM and TRA-Based Educational Materials; Health education materials should be designed by considering key components of the theory, such as perceived benefits, barriers, attitudes toward the behavior, social norms, and intentions, to strengthen promotional messages and increase the effectiveness of outreach. The use of digital media, health applications, or online

platforms based on HPM and TRA can be an effective, interactive, and easily accessible alternative, especially to reach productive age groups and adolescents.

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Informed Consent Statement

Before respondents become research respondents, respondents fill out a statement of agreement (informed consent statement) to become research respondents, after which they can take part in research activities.

Conflicts of Interest

The authors declare that there is no conflict of interest related to the research, authorship, or publication of this article.

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