

EFFORT TO INCREASE THE ROLE OF GUARDIANS AND PREGNANT WOMEN FOR CHILDREN'S HEALTH SCIENCE IN THE WOMB WITH RADIOLOGY SCREENING

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ABSTRACT

Abstract: Early detection of fetal health is an essential step in preventing complications that may affect a child's quality of life. Radiological screening, particularly ultrasonography (USG), serves as a tool to detect fetal health conditions. However, the understanding of student guardians and pregnant women regarding the urgency of radiological screening remains limited. This community service program aims to raise awareness and understanding among student guardians and pregnant women about the importance of radiological screening for the early detection of disorders that affect the growth and development of infants and toddlers. The activity was held on Friday, February 28, 2025, from 08:00 to 10:00 at one early childhood education (PAUD) partner in Sleman. Methods included lectures, interactive discussions, and the formation of 10 PAUD health cadres from the partner institution. The follow-up to this program involved training the cadets on preventive efforts using flipcharts that outlined the necessary actions for pregnant women and parents to monitor the growth and development of infants and toddlers, along with practical sessions in the community and with students at PAUD. The pre-test score was 63.28, while the post-test score increased to 82.68, indicating improved knowledge. In conclusion, this community service activity enhanced the knowledge of cadres and student guardians regarding the importance of radiological examinations (ultrasound and bone age assessments) for the early detection of growth and development in infants and toddlers, starting from the prenatal stage.

Keywords: Fetal Health; Radiological Screening; Ultrasonography; Bone Age Assessment; Early Detection; Community Service; Growth and Development.



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A. INTRODUCTION

Health child since prenatal period becomes foundation important For quality living in the future (Nasriyah & Ediyono, 2023; Juwita & Nurhaeda, 2025). Pregnancy period Not only about growth physique fetus, but also formation nervous system, psychological, and developmental term long. Study shows that literacy Pregnant mothers ability To understand, evaluate, and take decisions based on health information correlated with better pregnancies results (Putri et al., 2023). Besides that, sociodemographic factors such as education, access services and geographical locations proven to influence utilization service pregnancy in Indonesia (Aryastami & Mubasyiroh, 2023). This confirms that education and availability of good service play an important role in strengthening prenatal health.

One of the important variables that can support prenatal health is examination radiology, especially ultrasonography (USG). Ultrasound has been recognized as a tool playing in detecting early structural abnormalities of the fetus and monitoring pregnancy (Conner et al., 2013). Recent studies show that the ultrasound was performed in the first trimester or early second trimester own ability significant diagnostics to anomaly fetus (Buijtendijk et al., 2024). Thus, the examination radiology is not only a routine procedure but also proactive efforts in increasing the quality of pregnancy. Radiological screening, particularly ultrasonography (USG), plays a vital role in this process (Nurbeti et al., 2024). Through this technology, healthcare professionals can monitor fetal growth and development, identify potential abnormalities, and minimize the risk of complications that may occur during pregnancy and childbirth (Herlina et al., 2021). However, public awareness and understanding of the importance of prenatal examinations remains relatively low (Maryam & Ervianti, 2023).

In the environment partners devotion public namely PAUD Aisyiyah Al Amin, Sedayu District , Bantul Regency, it was found that Lots of pregnant mothers and the guardians have literacy poor health including lack of understanding about pregnancy inspection routine and ultrasound (Kristhosa, 2025). Qualitative research in Indonesia found that pregnant mothers often have difficulty accessing and understanding health information, as well as applying the information to real action during pregnancy. This is reinforced by studies showing that intervention health literacy for Mother earning low is very required (Ningrum et al., 2024). Many pregnant women still do not undergo regular prenatal check-ups (Wau & Razella, 2020; Anggraeni & Widayati, 2022). This is often caused by limited knowledge and a lack of accurate information regarding the benefits and procedures of the examinations, especially concerns related to radiation exposure and the potential negative effects of radiological screening. (Fatmarizka & Chafsoh, 2023).

Based on conditions observed in the field, it is essential to implement interventions that can enhance public understanding and awareness,

particularly among student guardians and pregnant women. Health education serves as an effective method for delivering clear, accurate, and evidence-based information regarding the importance of radiological screening. In this context, the community service activity designed to improve understanding of radiological screening can have a significant impact. This community service activity is planned to be held at PAUD Aisyiyah Al Amin, Sedayu, Yogyakarta. It will involve experienced radiology and obstetrics-gynecology specialists who will deliver lectures and lead interactive discussions. Through this approach, participants will receive comprehensive explanations about the benefits, procedures, and positive impacts of radiological screening on child health. By providing a detailed explanation of the examination process, it is expected that pregnant women and student guardians will gain a better understanding of the importance of undergoing routine prenatal examinations.

The aim of this community service activity is to increase participants' awareness and knowledge regarding the importance of radiological screening. Through this educational session, participants are expected to understand how screening can assist in the early detection of various abnormalities that may occur in the fetus. This is particularly crucial, as the earlier a condition is identified, the greater the opportunity for appropriate intervention and the lower the risk of complications that could endanger the health of both the fetus and the mother. This program also seeks to address common questions and concerns that pregnant women may have about radiological screening. For example, many expectant mothers are worried about radiation exposure during the ultrasound process. In addition to lectures and interactive discussions, participants will be given the opportunity to ask questions and engage in dialogue about topics related to pregnancy and fetal health. This activity is expected to create a supportive environment for pregnant women to share their experiences and obtain the information they need.

This community service activity, conducted at PAUD Aisyiyah Al Amin, Sedayu, Yogyakarta, is expected to increase public awareness and understanding especially among pregnant women regarding the importance of radiological screening. Through systematic and continuous health education, it is hoped that a healthier and higher-quality generation will be fostered. Increased knowledge about prenatal examinations will encourage pregnant women to be more proactive in maintaining their own health and that of their fetus, while also minimizing the risk of complications during pregnancy. Therefore, this community service activity is not merely an outreach effort, but also an investment in the future health of the next generation.

B. METHODS

This community service activity was carried out at the Aisyiyah Al Amin Early Childhood Education Center (PAUD) in Sedayu District, Bantul Regency, Yogyakarta Special Region, which served as the activity partner. The partners were selected based on their close relationship with the community of pregnant women and their parents, who have a need for health education related to radiology examinations. The activity involved 115 participants, consisting of pregnant women, expectant mothers, and parents.

The implementation method was regularly structured into three stages: pre-activity, implementation, and evaluation. During the pre-activity stage, coordination with partners, educational materials were developed, and evaluation instruments were designed. The educational materials focus on the importance of radiological examinations (especially ultrasound), their benefits in early detection of fetal abnormalities, and the safety of the procedure for pregnant women. The evaluation instruments were prepared in the form of multiple-choice questions.

The implementation phase included four main activities: (1) an educational lecture by a radiologist and obstetrician-gynecologist, (2) an interactive question-and-answer session to clarify participants' misconceptions, (3) distribution of educational brochures as follow-up learning materials, and (4) limited mentoring, including brief individual consultations. In addition, informal interviews were conducted with several participants to assess their responses to the activity and explore further information needs.

The evaluation phase employed a pre-test and post-test design, using an instrument consisting of 10 multiple-choice questions that measured understanding of the purpose, benefits, and procedures of ultrasound examinations. Each question was scored 1 for a correct answer and 0 for an incorrect answer. The test results were analyzed descriptively using Microsoft Excel to calculate and compare the average pre-test and post-test scores as an indicator of participant knowledge improvement.

Descriptive analysis was used because this approach suited the scale of the activity and the exploratory objectives of the program. However, this method has limitations because it does not measure statistical significance inferentially, so the results are indicative and cannot be broadly generalized. Awareness of this limitation was taken into consideration in designing follow-up activities with a more robust evaluation approach.

C. RESULT AND DISCUSSION

1. Result

a. Pre-Activity

Stage beginning implementation activity devotion public This started with identification and selection partners, namely PAUD Aisyiyah Al Amin Kalijoho which is located in the District Sedayu, Regency Sleman, Special Region of Yogyakarta. Election partners based on considerations proximity institution with community Mother pregnant, guardians, and existence cadre active integrated health posts in the neighborhood the implementation team Then do coordination technical with party partners for determine time implementation activities, targets participants, as well as need necessary supporting facilities and media during activity ongoing.

Material education arranged based on study literature latest and consultation together source person expert from field radiology and obstetrics-gynecology. Material focused on the importance of detection early abnormalities fetus through inspection radiology, in particular ultrasonography (USG), as well as its utilization in monitoring grow flower children. Besides that aspect security procedures and corrections to misconception general related radiation also becomes part from content material. For support evaluation, team compile pre-test and post-test instruments in form question choice double as much as ten designed items for measure level understanding participant before and after session education. Amount successful participants collected as many as 115 people, consisting of on Mother pregnant, guardians, and cadre Integrated health post (*posyandu*). Registration process participant done in a way directly on the day activities and participants given explanation about event flow and objective pre-test and post-test evaluation as part from assessment improvement knowledge.

b. Implementation Activity

Core activity was carried out on February 28, 2025, taking place in the room Aisyiyah Al Amin PAUD class. The event began with welcome from party partners and delivery people from team implementer about background behind activity as well as the urgency for improvement literacy health community. Session education moderated by a facilitator from team devotion, with material delivered by a doctor specialist radiology and doctors specialist obstetrics-gynecology. Exposure material done in a way interactive with visual presentation media assistance for participants more easy understand bullet points important. As for documentation activity shown in Figure 1 and Figure 2 below:



Figure 1. Delivery Material During Activity Community Service



Figure 2. Atmosphere Participant During Activity Community Service

Based on Figure 1 and Figure 2 above show enthusiasm tall participant during session activity absorbent public taking place. Some participant in a way active submit question around the role of ultrasound in detection early stunting risk, examination age bone for monitor growth children, and security repeated use of ultrasound during pregnancy. Response This reflect involvement active participant at a time show increased desire know to topics discussed. Besides session lecture and questions Responsible, activities also include formation group cadre health from participants who demonstrate interest and involvement active. A total of 10 cadres selected given task for continue distribution information in the scope community each with approach communication directly. Steps This intended as form program sustainability and expansion impact education that has been delivered.

c. Evaluation

Evaluation to success activity done use pre-test and post-test approach one group without control. Before session education started, participants requested for answer ten question choice double measuring knowledge base they about benefit ultrasound examination, a safe procedure, and function radiology in monitoring grow flower fetus and child. After the session education finished, participants do return same question as a post-test.

Result of second test collected and processed use device Microsoft Excel software. Every answer Correct given score 1 and wrong answer is given score 0. The average pre-test score shows mark of 63.28, while the average post-test score increased to 82.68. The difference score by

19.4 points show existence improvement understanding participant to the material presented.

Analysis done in a way descriptive remember limitations source power and properties activities that are of a nature educative community. Although no statistical tests were conducted inferential such as t-test, approach This considered Enough For describe trend general change knowledge. Limitations method This is No capable show significance statistics or variability individual in a way detailed, but the result still give strong foundation for evaluation the start and development of similar programs in the future.

2. Discussion

a. Socialization, Lecture, and Brainstorming

The community service activity entitled "Enhancing the Role of Student Guardians and Pregnant Mothers in Child Health from the Womb and Monitoring Child Development through Radiological Screening" was held on Friday, February 28, 2025, from 08:00 to 10:00 at PAUD Aisyiyah Al Amin Kalijoho, Sedayu, Sleman, Yogyakarta. The event began with a pre-test, followed by opening remarks from several figures, including Mrs. Dra. Siti Lestari (Head of Aisyiyah Branch Leadership Argosari), Mrs. Mencik Rumiasih, S.Pd (Head of Basic and Secondary Education), the hamlet heads of Kalijoho and Klangon, and Mrs. Laelatul Musfiroh, S.Pd (Principal of PAUD).

After the opening, the main session commenced with a presentation covering several key topics: the role of pregnant women in ensuring child health from the womb, fetal monitoring through antenatal care and ultrasound to assess organ development according to gestational age, fetal weight estimation, and gestational age calculation. Postnatal examinations such as bone age assessment were also introduced as tools to evaluate whether a child's growth corresponds to their age and expected body weight. The use of the Child Health Card (KMS) through regular *posyandu* visits was emphasized. In addition to physical health, maternal mental and spiritual well-being during and after pregnancy was also addressed. The event was attended by 115 participants, consisting of student guardians and *posyandu* cadres. Educational grants were provided, including baby and toddler educational toys, as well as flipchart leaflets on bone age, comprising 40% of the community service grant funds.

An active discussion session followed, with several questions raised by participants, such as: (1) Is a child's intelligence influenced by parental genetics? and (2) What are the early signs of stunting in babies/children, can it be detected early, and what is the role of radiology in detecting child development and stunting? The post-test results showed a significant increase in participants' knowledge, with

average scores increasing from 63.28 to 82.68 after the material presentation. During the discussion and brainstorming session, it was agreed that this community service program would continue with the formation of a child development screening cadre team. The next stage of the program will involve the preparation of training materials focused on improving skills in bone age assessment and evaluating developmental status using the Child Health Card.

Bone age, or skeletal age, is an important indicator in assessing the growth and development of children, especially infants and toddlers. This examination is typically performed through radiographic imaging of the left hand and wrist, which is then compared to standardized growth references such as the Greulich-Pyle atlas (Cavallo et al., 2021; Kim et al., 2023). Bone age, or skeletal age, is a crucial indicator in evaluating the growth and development of children, particularly in infants and toddlers. This examination is typically carried out through radiographic imaging of the left hand and wrist, which is then compared to standardized growth references such as the Greulich-Pyle atlas. The importance of bone age assessment lies in its ability to determine whether a child's physical growth is appropriate for their chronological age. A delay in bone age may signal potential growth disorders, such as malnutrition or hormonal imbalances. Additionally, bone age is useful in detecting endocrine or genetic conditions, as children with growth hormone deficiencies, hypothyroidism, or certain genetic syndromes often show significant discrepancies between bone age and actual age. It also plays a role in predicting a child's adult height, particularly when concerns about short stature arise. Furthermore, early bone age assessment enables timely diagnosis of growth abnormalities, allowing for more effective intervention. In cases where children are undergoing hormone therapy or other medical treatments, bone age is a valuable tool for monitoring therapeutic progress. This assessment is particularly recommended for children with abnormal growth patterns, early or delayed puberty, thyroid or genetic disorders, or those receiving hormonal treatments (Martin et al., 2022; Prokop-Piotrkowska et al., 2021).

b. Monitoring and Evaluation

Monitoring and evaluation to success of the community service program to public This implemented through approach quantitative and qualitative which are mutually complete. In quantitative, increase understanding participant measured through comparison pre-test and post-test scores. The results show that the average pre-test value was 63.28, which was improvement to 82.68 in the post-test. The increase by 19.4 points This reflect impact positive from activity education that has been given. Deviation standard from second results test, namely 8.5 for the pre-test and 7.9 for the post-test, indicating that distribution

score participant relatively stable, indicating that improvement knowledge happen in a way evenly and unevenly only limited to groups certain.

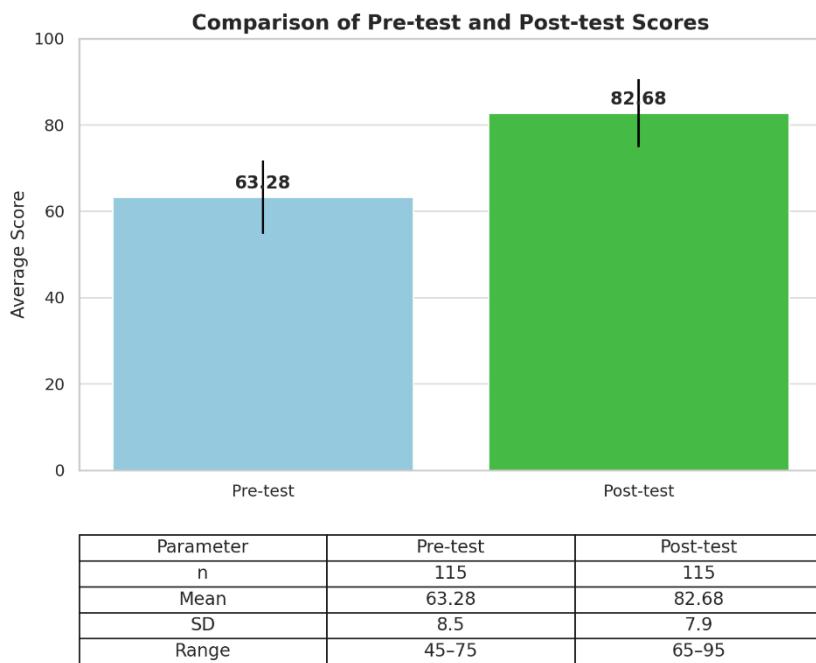


Figure 3. Graph of Pre-Test and Post-Test Scores of Community Service Participants

From the side qualitative, improvement understanding participants are also reflected from dynamics ongoing discussion during activities. Participants show high interest to material with submit relevant and in-depth questions, including those regarding detection early stunting, role radiology in monitoring grow flower children, and accuracy internal ultrasound examination determine age pregnancy. Increased intensity discussion and engagement participant become indicator important that intervention educative No only succeed transfer information, but also able to push participation active and thinking critical.

As part from effort program sustainability, has formed ten cadre from participant activities that demonstrate interest and involvement active. The cadres This expected play a role as extension hand educational programs at the level community. Monitoring plan for cadre will done during three month after implementation activity main. The cadres will on duty convey return information about importance inspection pregnancy via ultrasound and monitoring grow flower child use appropriate approach with characteristics the community each.

Indicator success of the cadre program covers achievement education to group targets in their area, increasing understanding assisted

communities, and participation active cadre in health forums local like integrated health posts and religious studies mothers. Besides that, reporting activities by cadres, both in the form of documentation narrative or simple data, will become part important in evaluation program sustainability. Evaluation to performance cadre will done in a way periodic every end month during three month in a row. In evaluation said, the team implementer will do meeting coordination with the cadres for review achievement, evaluate obstacles encountered in the field, as well as formulate step strategic for improvement effectiveness of educational programs. Through structured and scheduled monitoring approach this is a community service program No only based on success moment in activity main, but also directed towards creation impact term sustainable length through mechanism cadre development and empowerment community (Kartikasari et al., 2023; Martin et al., 2022).

c. Challenges Encountered or Other Issues Identified

Several common challenges encountered during the community service activity include the following. First, there was a lack of initial understanding among the community. Many student guardians and pregnant women do not fully grasp the importance of radiological screening, requiring a communicative and educational approach to effectively convey the information. Second, the limited duration of the activity only two hours (08:00–10:00) may not have been sufficient to deliver the material in a comprehensive and interactive manner. This highlights the need for follow-up training using simple and practical teaching aids that cadres can easily adopt. Third, there was a shortage of resources, both in terms of personnel and materials. With only 10 cadres formed, outreach to the wider community may be suboptimal, and the availability of educational tools such as flipcharts or engaging visual aids was limited (Arief et al., 2024; Yuliantari et al., 2022).

D. CONCLUSION AND SUGGESTION

Activity devotion community activities carried out at one of the PAUDs in the local area succeed increase understanding and awareness guardians and Mother pregnant about importance inspection radiology, in particular ultrasonography and assessment age bones, as part from detection early disturbance growth and development child since the prenatal period. Activities This implemented through lectures, discussions interactive, as well as formation ten cadre health plays a role as agent education in the community. Improvement understanding participant reflected from increase the average pre-test score was 63.28 and became 82.68 in the post-test. In addition to quantitative data, the evaluation qualitative show existence improvement interaction two direction during discussion, which indicates involvement active participants and growth awareness critical to issue health

mother and child. Although Thus, the activities This face a number of challenges, such as limitations time implementation and still limited educational media that can used in a way widely by cadres in the field. However, participation active participants and enthusiasm in session discussion become supporting force success activity in a way overall.

Plan action carry on covers training advanced for cadre health with focus on monitoring growth children and detection early disturbance development using educational media such as leaflets or other visual aids. Target achievement from stage next is increasing amount Mother pregnant and parents who have education in a way direct from cadres, increasing coverage monitoring grow flower children in the community, as well as formation system reporting simple based community. Indicators success covers involvement cadre in activity integrated health post, improvement understanding public measured targets through evaluation periodically, and creation ongoing collaboration between cadres, institutions education and facilities service health basic. Impact term expected length is improvement quality service health mother and child at the level community in a way independent and sustainable.

For development activity similar in the future, it is recommended that the allocation time implementation expanded to allow delivery more material deeper and more practical interactive. It is also necessary to prepare more many simple and applicable educational media so that you can utilized by cadres optimally in education society. Besides that, strengthening partnership between institution education, facilities health, and figures public local very important for support program sustainability. Evaluation term long based communities also need designed as part from system monitoring and control quality service health mother and child.

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