



The Application Of Fetal Music Instrumental Tools Helps Fetal Growth In The Womb Of Pregnant Women At Posyandu Kemuning 1A Village Sukamakmur Ciomas

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ARTICLE INFO

Article history

Received : 16-2-2025

Revised : 27-2-2025

Accepted : 28-2-2025

Keywords

Instrumental Music;
Fetus; Posyandu;
Community Service;
Ciomas

ABSTRACT

Good fetal growth and development from the mother's womb can give birth to a generation that is healthy, intelligent, and of good character. Good fetal growth is influenced by several factors, namely: Good eating habits, hormonal factors and the environment around the fetus. One way to maximize the process of fetal growth in the womb is that the mother must play an active role in making efforts so that the baby grows actively when born later. one of them is to take advantage of fetal stimulation in the womb with a music sound player system for the fetus. Based on the 2023 questionnaire, there is a request from the community for the community service team to hold socialization and training on healthy heart and fetal development using the research results of the Lecturer which can be implemented in the 2024 community service program to implement the Fetal Music Instrumental Tool to Help Fetal Growth in the Womb of Pregnant Women at Posyandu Kemuning 1A Sukamakmur Village, Ciomas. This community service implements IKU 2, namely students gaining experience outside campus and IKU 3 where lecturers carry out activities outside campus and IKU 5, namely the work of lecturers is used by the community. In addition, this activity produces HAKI products, videos of activities, articles in various electronic media, and publications in community service journals.

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A. INTRODUCTION

Posyandu Kemuning 1A is chaired by Mrs. Halimah who conveyed the impact of abnormal fetal growth found in the ciomas community, especially when checking at Posyandu Kemuning 1A Ciomas. Stunting can have a serious impact on fetal development (Retnowati et al., 2017). According to WHO, around 20% of stunting cases have occurred when the baby is still in the womb, stunting in the fetus can cause several problems, such as: failure to grow, namely babies born with low body weight and small body size, cognitive and motor development obstacles in the form of children may experience delays in brain development and motor abilities, as well as metabolic disorders in the form of increased risk of non-



communicable diseases such as diabetes, obesity, and heart disease later in life (Umam et al., 2022). The lack of knowledge of the community around Posyandu Kemuning 1A in Sukamakmur Ciomas Village regarding fetal development has an impact on stunting, which is still located in rural areas, midwives also have difficulty checking fetal development. Prevention of stunting begins during pregnancy by ensuring adequate and quality nutritional intake, and routinely checking pregnancy conditions with a doctor (Mustikawati., 2023).

In this community service, there is a team of 5 people, namely the Chairperson of the Service named Marybet Tri Retno Handayani, M. Farm assisting in coordination with the head of the posyandu and socialization of nutrition for pregnant women based on community health independence. Yuli Wahyuni, ST, MT with her field of expertise, namely Computer Engineering as a member 1 who provides training on fetal instrumental devices. apt. Nyayu Siti Aminah Lily Elfrieda, M.Farm as a member of community service 2 who will be tasked with assisting in providing socialization of healthy fetal development and the impact of stunting in the Kemuning posyandu. In this community service team there is a cross-field of science, namely the field of Computer Engineering collaborating with Medical Pharmacy and Health Education Communication Counseling, which later it is hoped that this activity will provide enormous benefits both in terms of the use of science and technology for the community, pregnant women's health tools and the implementation of research results, optimizing community services in helping to create peace, and comfort in community life and making it easier to check fetal development starting early. In this service, the team was also assisted by 1 secretary who assisted in making RAB and reports by the name of Nur Amalia, 1 technical staff who assisted in questionnaire analysis and 2 Pakuan University Pharmacy Study Program students named Rinoa Sahda Rahayu NPM 066122022 and Pedro Prasetyo Atmojo NPM 066121157 while the cooperation partner was Posyandu Kemuning 1A Sukamakmur Ciomas Village which was chaired by Mrs. Halimah. This community service implements IKU 2 namely students gaining experience outside the campus (Anam et al., 2024) and IKU 3 where lecturers carry out activities outside the campus (Antoni et al., 2022) and IKU 5 is the work of lecturers used by the community (Kurniadi et al., 2023).



Figure 1. Initial Coordination with Partners Head of Posyandu Kemuning 1A Sukamakmur Ciomas Village Mrs. Halimah



In Posyandu Kemuning 1A, Sukamakmur Village, Ciomas, there are many stunting conditions where toddlers have less length or height when compared to age. This condition is measured by length or height that is more than minus two standard deviations of the WHO median child growth standards. Stunting has short to long-term effects, including increased mortality and morbidity (Ekayanthi et al., 2019). Stunting can also have an effect on poor child development and impaired learning capacity, increased risk of infection and non-communicable diseases (Rahayu et al., 2018). These risk effects affect the growth and development of children in the future, therefore it is important to prevent stunting from the beginning of life (Nasriyah et al., 2023). In addition, the lack of knowledge, especially the community around Posyandu Kemuning 1A in Sukamakmur Village, Ciomas related to healthy fetal development and nutrition of pregnant women while in the womb, monitors and ensures the health of pregnant women and fetal growth and development in the womb goes well, detects complications that may occur during pregnancy, improves the health of pregnant women and prospective babies and prepares the delivery process so that it can run smoothly. And reducing the risk of trauma to pregnant women during childbirth so that the socialization and training of instrumental fetal music tools is not only beneficial for mothers, the relaxing effect that music gives to the mother's body during pregnancy also benefits the future baby in the womb because, the more stable the mother's condition emotionally, the hormones in the body will be more stable and this helps the fetal growth in the womb take place more optimally. The team's service experience based on the results of the community questionnaire suggested that assistance in checking the heart and fetal health development using tools from the results of the lecturer's research, the following are the results of the questionnaire:

No	Pertanyaan	Pilih Jawaban (Orang)		Persentase					Saran
		Ya	Tidak	25%	50%	75%	100%		
	Apakah Saudara mengetahui pentingnya layanan masyarakat?	20	2						
2	Apakah anda mengetahui tentang kegiatan layanan yang ada di masyarakat?	20	2						
3	Apakah penting diadakan sosialisasi terkait Gizi Ibu Hamil dan 1000 Hari Kehidupan?	19	3						
4	Apakah anda paham terkait materi yang diberikan oleh tim pengabdian masyarakat?	20	2						
5	Seberapa paham penguasaan materi yang telah diberikan?					2	20		
6	Dari paparan materi Gizi Ibu Hamil dan 1000 Hari Kehidupan, menurut Ibu seberapa penting dalam pemenuhan gizi untuk Ibu dan anak?						2	20	
7	Apakah kegiatan pengabdian masyarakat ini penting buat Ibu?	20	2						
8	Apakah kegiatan pengabdian masyarakat ini bermanfaat untuk Ibu?	19	3						
9	Apakah Ibu ada saran terhadap kegiatan pengabdian masyarakat?	18	4						1. Perlu adanya pembelajaran gizi terhadap anak-anak 2. Bisa makan gizi ibu dan anak 3. Perlu adanya pemahaman detak jantung 4. Perlu adanya sosialisasi tentang gizi yang baik untuk kesehatan jantung 5. Pembuatan aplikasi menggunakan hp informasi tentang grafik jantung 6. Perlu adanya informasi terkait penyakit jantung 7. Perlu adanya alat pemantauan kesehatan jantung 8. Pelatihan dan pendampingan tentang sosialisasi detak jantung 9. Perlu adanya alat pemantauan kesehatan
10	Apakah perlu diadakan kembali kegiatan pengabdian masyarakat seperti ini?	20	2						

No	Pertanyaan	Pilih Jawaban (Orang)		Persentase					Saran
		Ya	Tidak	25%	50%	75%	100%		
1	Apakah saat ini pelayanan di Posyandu Kemuning 1 A Desa Sukamakmur Ciomas masih konvensional?	1							
2	Apakah perlu dibuat pendataan melalui aplikasi?	1							
3	Apakah anda bisa menjalankan komputer / handphone?	1							
4	Apakah aplikasi gizi kronik mudah digunakan?	1							
5	Apakah aplikasi gizi kronik telah dibuat sesuai kebutuhan?					1			
6	Apakah aplikasi gizi kronik yang telah dibuat, dapat membantu kinerja kader Posyandu?	1							
7	Apakah aplikasi gizi kronik yang telah dibuat, dapat mempermudah dalam mendata masyarakat yang memiliki riwayat gizi kronik?	1							
8	Apakah aplikasi gizi kronik yang telah dibuat, dapat mempercepat pekerjaan kader Posyandu?	1							
9	Apakah aplikasi gizi kronik ini dapat memberikan informasi terkait gizi kronik?	1							
10	Apakah ada saran untuk keberlanjutan pengabdian masyarakat di Posyandu Kemuning 1 A Desa Sukamakmur Ciomas	1							1. Pengidentifikasian kesehatan ibu dan anak melalui detak jantung. 2. penerapan implementasi gizi untuk anak paud misalnya menggunakan aplikasi pembelajaran tatacara gizi yang baik buat anak-anak paud dan TK.

Figure 2. Results of Questionnaire Requesting Community Service on Healthy Heart and Fetus

The application of socialization and mentoring training, this service team implements the results of research that has been carried out with the research title, namely "Internet of Things-

Based Fetal Music Instrumental”, how the tool works with a series of DFPlayer Mini, LCD I2c 20x04, NodeMCU esp8266 and amplifiers which are then installed on a belt that has a speaker attached to the belt, then the speaker is connected to the circuit in the black box so that it can produce sound output in the form of music for the fetus. This tool uses a Wifi network to connect between the tool and the device to be used, after the tool is connected, the IP Address will appear on the LCD. connected, the IP Address will appear on the LCD to be accessed using a browser to enter the main page of the website to select and play music.

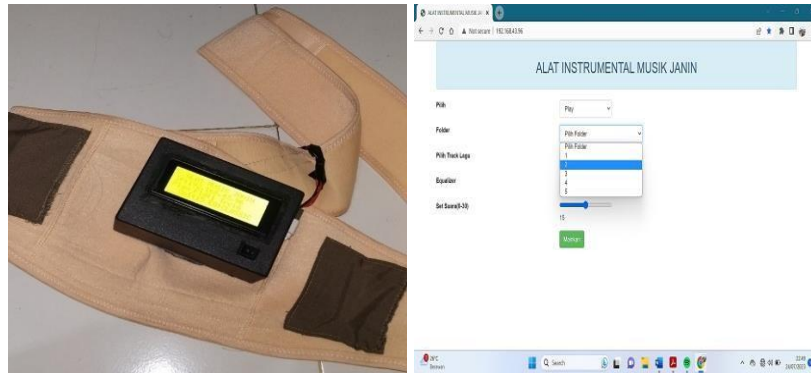


Figure 3. Internet of Things-based Fetal Music Instrumental Research Tool that will be used for Community Service at Posyandu Kemuning 1A Sukamakmur Ciomas Village

B. METHODS

In this community service activity, the steps and methods carried out are:

1. Preparation of Running Tools and Cardiac Applications

In the preparation of fetal music instrumental research tools, the team will prepare the tools by checking the running of the tools before the mentoring training is held (Ningtias., 2024).

2. Training and Assistance on the Use of Cardiac Tools and Applications

The initial concrete step that needs to be done is to reassemble midwives and health workers and cadres who help Posyandu Kemuning 1A Sukamakmur Ciomas Village to identify the extent of the ability to operate instrumental fetal music tools. The method used is through questionnaires and tests of the ability to operate the tool both through written tests and practical tests. The short-term goal of this activity is to classify the trainees by determining the training material. The long-term goal is to regenerate midwives and health workers as well as some cadres who help Posyandu Kemuning 1A Sukamakmur Ciomas Village regarding the sustainability and development of this program. In general, there are four stages of training, namely: pre-training assessment, design, implementation and post-training assessment (Mathis et al., 2006).

3. Making Training Videos

To assist officers such as midwives, health workers, and cadres of Posyandu Kemuning 1A Sukamakmur Ciomas Village in using the fetal music instrumental tool, a video tutorial will be made. During the training and assistance in implementing the fetal music instrumental tool application, the team will also make a video about community service activities, which will be uploaded to YouTube as evidence of training and dissemination of information to the community.

4. Publication in Online Mass Media



The output is the publication of community service results in online media, namely electronic articles published in various online media with the aim of publicizing activities carried out by the community service team.

5. National Journal Publication and ISBN Book Creation

The team conducts community service activities by publishing conceptual results in publication journals and making books.

6. Partner Participation in Program Implementation

The role of partners is crucial in arranging letters related to community service activities, arranging the attendance of participants by Posyandu leaders, gathering Posyandu cadres, serving as a liaison for filling out questionnaires, recording attendance of activities, as well as providing space for the implementation of socialization and training on the use of technology.

7. Evaluation of Program Implementation and Program Sustainability in the Field After Activities Completed

After the program ends, a review is conducted to ensure that the implementation and sustainability of the program in the field have met the objectives. The review is also conducted to ensure that the application of the technology optimally utilizes the potential for the community in the health sector and provides important data for future program improvement and development.

C. RESULTS AND DISCUSSION

At Posyandu Kemuning 1A in Sukamakmur Village, Ciomas, many cases of stunting were identified, which is a condition where children under five years old have height or length measurements that are inappropriate for their age (Erwina et al., 2020). This is measured by height or length falling below two median standard deviations of the WHO child growth standards. Stunting can have both short- and long-term negative impacts, including an increased risk of death and disease (Sumartini et al., 2022). In addition, stunting can also affect children's development and lead to impaired learning ability, increased likelihood of infection and risk of non-communicable diseases (Nirmalasari., 2020). The impact of these risks can affect a child's future growth and development, so preventing stunting from early in life is crucial.

Furthermore, the lack of knowledge, especially among the community around Posyandu Kemuning 1A in Sukamakmur Village, Ciomas, regarding healthy fetal development and maternal nutrition during pregnancy affects the monitoring and assurance of pregnant women's health and fetal development. This aspect aims to detect potential complications during pregnancy, improve the health of pregnant women and fetuses, and prepare the delivery process to take place properly. It can also reduce the risk of trauma experienced by the mother during childbirth. Therefore, socialization and training on the use of instrumental music for the fetus is needed. Music is proven to not only provide benefits to the mother, but also provides a relaxing effect on the mother's body which in turn benefits the fetus. When the mother's emotional condition is stable, the hormones in the body are also more balanced, supporting more optimal fetal development. The team's experience in community service, based on the results of the questionnaire, recommends the need for assistance for heart health checks and fetal development using tools from the lecturer's research.

The application of socialization and mentoring training, this service team implements the results of research that has been carried out with the research title, namely "Internet of Things-Based Fetal Music Instrumental", how the tool works with a series of DFPlayer Mini,

LCD I2c 20x04, NodeMCU esp8266 and amplifiers which are then installed on a belt that has a speaker attached to the belt, then the speaker is connected to the circuit in the black box so that it can produce sound output in the form of music for the fetus. This tool uses a Wifi network to connect between the tool and the device to be used, after the tool is connected, the IP Address will appear on the LCD (Wahyuni et al., 2022). connected, the IP Address will appear on the LCD to be accessed using a browser to enter the main page of the website to select and play music (Wahyuni et al., 2024). rate

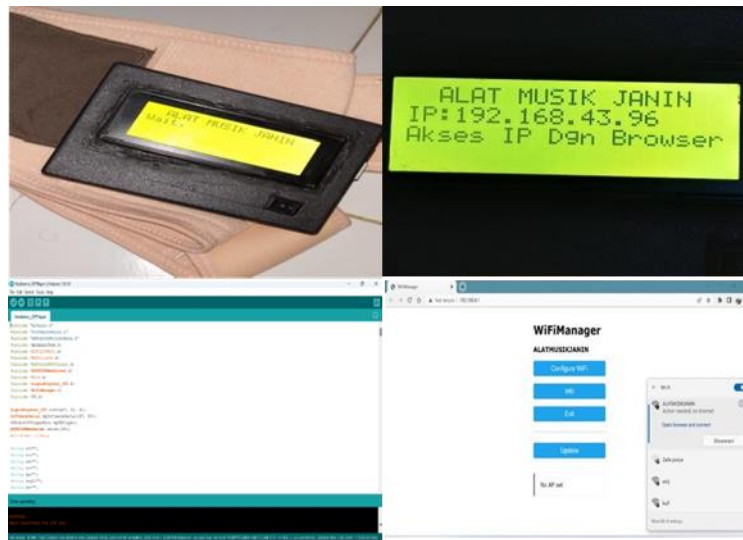


Figure 4. Internet of Things-Based Fetal Music Instrumental Research Tool to be Used for Community Service at Posyandu Kemuning 1A Sukamakmur Ciomas Village (Yuli., 2023)

On this occasion, Mrs. apt. Marybet Tri Retno Handayani, M. Farm provides knowledge to the community about the socialization of nutrition for pregnant women based on public health independence about the importance of good and balanced nutrition in each trimester of pregnant women besides that Mrs. Mrybet also conveyed the standard nutritional needs based on the nutritional adequacy rate recommended for pregnant women.



Figure 5. Material by Mrs. apt. Marybet Tri Retno Handayani, M. Farm

Furthermore, Yuli Wahyuni, ST, MT provided training and assistance on operating instrumental fetal music tools to a number of participants, including midwives and health workers, as well as two cadres from Posyandu Kemuning 1A Sukamakmur Village Ciomas. The training activities were carried out for two (2) days on January 25-26, 2025 every day from 09.00-13.00. The result of the training was that midwives, health workers, and staff members

of Posyandu Kemuning 1A have acquired the skills to use fetal music instrumental tools. At the initial stage, instructions were given to learn the fetal instrumental device. Next, an overview of the operation of the tool was taught. Next, the detailed system related to the operation on the dextrop and mobile android were taught.



Figure 6. Material by Mrs. Yuli Wahyuni, ST., MT

Fetal music instrumental checks are also carried out on pregnant women where pregnant women feel a lot of comfort in using this tool, pregnant women feel relaxed and relaxed when using the tool, here are some direct checks on pregnant women:



Figure 7. Fetal Music Instrumental Check to Pregnant Women

D. CONCLUSION

This community service activity has successfully met its objectives and has resolved several problems that have been addressed in this program, namely: assisting health workers in community services, assisting in checking fetal development early on to minimize the risk of fetal death and stunting, the availability of portable digital aids helps pregnant women, the relaxing effect of music on the mother's body during pregnancy also benefits the baby in the womb, providing knowledge transfer related to the importance of health science about fetal development, stunting and nutrition during pregnancy in the world of health, providing insight into fetal development and nutrition during the trimester of pregnancy and how to minimize the risk of fetal stunting, providing training and socialization of the use of instrumental tools especially for posyandu cadres and pregnant women and the surrounding community at the Kemuning 1A posyandu, improving the quality of performance and



excellent service to the community based on Posyandu in Sukamakmur Ciomas Village, with this technology it can help stabilize the mother's condition emotionally, hormones in the body will be more stable and this helps the growth of the fetus in the womb to take place more optimally and is free of charge so that it helps the community, especially in order to realize a healthy Indonesian society, the program's success indicators are measured using a questionnaire that will be distributed to the community with 25 community service participants who have a 90% success rate of skills after the program is implemented, the tools that given to Posyandu 1 unit of equipment, community participation in socialization activities and technology assistance training by contributing to understanding stunting in pregnant women and technology.

E.ACKNOWLEDGEMENTS

We would like to thank the Institute for Research and Community Service (LPPM) of Pakuan University for providing funds to the Community Service Program through the 2024 PKM funding scheme.

F.AUTHOR CONTRIBUTIONS

Implementation of the activity: Marybet Tri Retno Handayani, Yuli Wahyuni Article preparation: All community service team Impact analysis: Nyayu Siti Aminah Lily Elfrieda, Presentation of results: YW, Article revision: YW, Other contributions.

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