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Transformation of Sedentary Behavior Towards a Digital Active Lifestyle Through a Design Thinking Approach in Women Of Productive Age

Candra Wahyuni[1*], Asruria Sani Fajriah[2], Eri Puji Kumalasari[2], Erma Retnaningtyas[4], Miftakhur Rohmah[5], Nita Dwi Astikasari[6], Nining Istighosah[7], Retno Palupi Yonni Siwi[8], Riza Tsalatsatul Mufida[9], Shanty Natalia[10], Siti Komariyah[11], Ariska Nur Aisyah Putri[12], Mauliana Agustin[13]
[1,2,3,4,5,6,7,8,9,10,11,12,13] *Department of Midwifery, STRADA Indonesia University, Indonesia*
[*]***Corresponding author:*** *candrawahyuni85@gmail.com*

ABSTRACT
The demanding daily routines of women of productive age often lead to the neglect of physical and mental health. This sedentary lifestyle is exacerbated by a lack of time and limited digital health literacy, despite high smartphone ownership. This community service initiative aimed to transform sedentary behavior into a digitally active lifestyle by enhancing health digital literacy through a Design Thinking approach. An intensive one-day Edu-Tech Workshop was conducted for 25 women in the Blabak Health Center area, Kediri. The program utilized an abridged version of the Design Thinking framework—Empathize, Define, Ideate, Prototype, and Test—focusing on the practical application of m-health tools like Google Fit and Riliv. Evaluation was performed using pre-post tests, digital skills indicators, and a 7-day remote monitoring period via WhatsApp. Initial screening revealed that 68% of participants had low digital health literacy. Post-intervention data showed a dramatic surge in health application literacy, with average scores jumping from 35.2 to 92.0. All participants (100%) successfully configured health-monitoring ecosystems on their devices. Sustainability tracking indicated that 76% of participants actively reported achieving their daily step targets, and 60% consistently utilized digital breathing exercises to manage work-related stress. The one-day intensive workshop model effectively overcomes the "double burden" time constraints faced by modern women. By demystifying technology and integrating m-health into daily routines, this approach successfully fosters a sustainable transition toward independent health management.

Keywords : Design Thinking, Digital Literacy, Lifestyle, m-Health, Women of Productive Age.

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INTRODUCTION

Women of productive age are a strategic group in national development that carries a *double burden*, both in economic contribution and the maintenance of family resilience (KemenPPPA, 2024) In the era of digital transformation, health literacy is no longer seen as a mere theoretical understanding, but rather a critical ability to integrate health technology into the dynamics of complex daily routines (Sutha et al., 2026). However, a significant "health paradox" exists where women, acting as primary family health managers, face heightened vulnerability due to a lack of time for self-care (WHO, 2022). Higher intensities of dual-role conflict are directly proportional to increased risks of chronic fatigue and physical stress This inequality between domestic and professional roles creates a health paradox, where women as family health managers face higher health vulnerabilities due to the lack of time allocation for *self-care* (Wahyuni et al., 2025).

The relationship between dual roles (work and housekeeping) and physical health risks in individuals, especially women, is significant and proportional. The higher the intensity of dual role conflict, the greater the risk of physical health disorders due to accumulated physical stress and chronic fatigue (Chen et al., 2020) The importance of *work-life balance* and social support (family and workplace) is necessary to reduce these negative impacts.

The results of the 2023 Indonesian Health Survey (SKI) show that 37.4% of the Indonesian population aged 10 years and above do less physical activity. There are four main reasons why Indonesians do not do physical activity adequately, 48.7% say they don't have time, 32.6% admit to being lazy, 19.5% say they are elderly, and 9.8% feel they don't have a partner to do activities (BKPK, 2024) This reason shows that active living behavior has not fully become part of people's daily lives, even in the midst of increasing awareness of the importance of a healthy lifestyle. Time constraints, technological convenience, and increased sedentary activities such as sitting in front of a screen for long periods of time also reduce the level of daily activity, thereby increasing the risk of obesity in adulthood. Thus, although nutrition is the main focus of health policy, the problem of low physical activity remains a serious threat to people's productivity and quality of life (BKPK, 2025)

The primary barriers reported include time constraints (48.7%) and lack of motivation (32.6%). Specifically, in the working area of Blabak Health Center, Kandat District, Kediri, a similar pattern emerges where women of productive age exhibit limited health literacy despite high mobile device ownership. While smartphone access is nearly universal, its use remains restricted to social media and entertainment, failing to touch aspects of independent health management. Preliminary screenings in this area showed that 72% of women rarely exercised, and 60% experienced work-related stress. Furthermore, 56% of participants showed symptoms of mild psychological distress manifested as sleep disorders and chronic fatigue

Currently, there is a shift in information consumption towards digital media, but unfortunately, health information circulating on social media is often not tested for validity or is not relevant to local needs. The uncertainty of the validity of this information is a big challenge in increasing health literacy at the health center level (Mulyanti & Assad Rohimakumullah, 2024) The trend of global health education is starting to shift to a *labor-intensive and personalized* micro-intervention model through *m-health applications* such as *Google Fit* and *Riliv*, micro-interventions can be implemented in a targeted manner because they provide validated self-monitoring features (Fitriani & Mulyono, 2023). Digital-based healthcare solutions can accelerate, facilitate access, while maintaining service quality amid face-to-face limitations (BRIN, 2025).

The Design Thinking approach is utilized to ensure that the technological interventions answer the real, empathetic needs of the participants within an efficient timeframe. By demystifying technology—simplifying complex digital innovations into manageable tools—this program seeks to convert the smartphone from a "digital distraction" into a "personal health assistant". This strategy is crucial for women of productive age, as they are more responsive to "small but routine" micro-learning than long-duration seminars (Faizi et al., 2024).

Health empowerment programs in the previous health center area often used conventional counseling models with long durations and repeated face-to-face meetings. However, this model has been shown to be ineffective for women of productive age who have high mobility. Many participants were unable to participate in the entire series of programs due to constraints on working hours or domestic affairs, so knowledge transfer was interrupted (Wahyuni, 2025). Previous health program failures have often been caused by *a one-size-fits-all approach* that does not consider the psychosocial barriers and technical characteristics of the target participants (Amen, 2025). Without personalized interventions, this health literacy gap will continue to widen amid the rapid flow of digital disinformation. This is the main reason why the success rate of health programs in the regions often does not reach long-term targets.

This approach allows the transformation of education from mere passive information consumption to real health actions that are integrated with the participants' daily routines. The use of *m-health* applications is now a crucial strategy in bridging the gap in access to health services for people with high levels of busyness, due to its ability to provide private and *real-time health monitoring* (Faizi et al., 2024).

Conventional health empowerment programs in the health center area have historically relied on long-duration counseling models and repeated face-to-face meetings. This "one-size-fits-all" approach has proven ineffective for women with high mobility, as domestic and professional duties often interrupt knowledge transfer. Many participants are unable to complete the series of programs due to these rigid scheduling constraints (Wahyuni, 2025). Previous health program failures have often been caused by *a one-size-fits-all approach* that does not consider the psychosocial barriers and technical characteristics of the target participants (Amen, 2025). Without personalized interventions that consider these psychosocial and technical barriers, the health literacy gap continues to widen amidst the rapid flow of digital disinformation.

METHODS

The implementation of this community service uses the *Edu-Tech Workshop* approach which is integrated with *the Design Thinking framework (Abridged Version).* This approach was chosen to ensure that the technological interventions provided actually answered the real needs of participants in an efficient time. *Edu-Tech Workshop* is a workshop (short interactive training) that combines *the method of Education with Technology* as the main tool in the learning process. The method used is a *condensed version of* Design Thinking developed by *Stanford d.school*, which is This approach was chosen because of its effectiveness in producing innovative solutions in a limited time, but still based on empathy for the needs of participants (Khasanah, 2024).

Location and Subject of Community Service

This activity was carried out in the working area of the Blabak Health Center, Kandat District, Kediri Regency. The service subjects consisted of 25 women of productive age (age

range 20 - 45 years) who were domiciled in the work area of the Blabak Health Center, owned and actively used *gadgets* and were willing to participate in a full series of activities.

Stages of Implementation (Design Thinking Workflow)

Given the limited duration, *the Design Thinking* method is summarized into three main phases that are carried out in one intensive workday:

1. Diagnostik Phase (Empathize & Define)
   In the initial stage, the team identified the initial mental and physical health status of participants through *a Google Form* on each participant's device.
   a. Mental Health Screening: Using a digitized *Self-Reporting Questionnaire* (SRQ-20) instrument to quickly detect symptoms of anxiety and mild depression. The instrument has been validated by the WHO, covering 20 questions with "Yes" or "No" answers regarding neurotic symptoms. The cut-off point used is a score of 6, where a score of ≥ 6 indicates the presence of a mental-emotional disorder.
   b. Physical Activity Assessment: Physical activity assessment is carried out using the International Physical Activity Questionnaire - Short Form (IPAQ-SF) instrument. Participants were asked to report the duration (minutes) and frequency (days) of physical activity performed in the last 7 days. The data was then converted into MET-minutes/week (Metabolic Equivalent of Task) to determine the participants' physical activity level categories.
2. Technology Intervention Phase (Ideate & Prototype)
   This phase focuses on technology transfer and health digital literacy. Participants were guided to build an "Independent Health Ecosystem" on their respective devices:
   a. Installation and Configuration: Participants are guided to install *selected m-health* apps (such as step tracker/*Google Fit* apps and meditation/breathing/*Riliv guide apps*).
   b. Micro-Learning Session: Provides concise material on stress management at work, at home and light-moderate intensity physical exercise (HIIT) techniques that can be done on your own without tools.
3. Implementation & Test Phase
   Participants conduct a direct simulation of the use of the technology that has been installed:
   a. Self-Simulation: Practice using apps such as meditation for 5 minutes and synchronizing steps on a physical tracker app.
   b. Action Plan: Preparation of personal daily targets (e.g., 5,000 steps/day targets) that are input directly into the application.

Data Analysis Instruments and Techniques

To measure the success of the program, several instruments are used:

1. Pre-test and Post-test: Measure changes in knowledge about mental and physical health before and after the workshop.
2. Simplified Digital Skills Indicator: An observation sheet to assess participants' ability to operate health features on their devices.
   Likert scale questionnaire (1-4: Very inproficient to very proficient).
   Example questions:
   a. I can find information on how to cope with stress through the internet.
   b. I was able to download and use the health app on my phone.
   c. I can distinguish between true and fake health news (*hoax*) in WhatsApp groups.
   d. I know how to set an alarm for a workout or water time on my phone.

3. Data Analysis: Data was analyzed descriptively quantitatively to see the percentage increase in literacy, as well as a qualitative analysis of a brief reflection session at the end of the activity.

Program Sustainability

Although the face-to-face intervention is carried out in one day, the sustainability of the program is ensured through the formation of a "Digital Support Group" via the WhatsApp platform. This group functions as a medium for remote consultation with health workers at the Blabak Health Center and the service team for 7 days post-activity to monitor the consistency of the use of health applications by participants.

RESULT

Participant Characteristics

This activity involved 25 female participants of productive age. These characteristics include age, education level, employment status, and complaint history presented in the following Table.

Table 1 Demographic Profile and Complaint History of Participants (n=25)

Features	Category	Frequency (n)	Percentage (%)
Age	20 – 30 Years	8	32%
	31 – 45 Years	17	68%
Education	High School/Equivalent	15	60%
	Diploma/Bachelor's	10	40%
Jobs	Housewives	9	36%
	Employee/Self-Employed	16	64%
Ownership of gadgets	Android/iOS	25	100%
History of Physical Complaints*	Frequent muscle aches/pain (myalgia)	18	72%
	Fatigue	15	60%
	Frequent headaches/dizziness	10	40%
History of Mental Complaints*	Difficulty sleeping (mild insomnia)	14	56%
	Feeling anxious/burnout at work	12	48%
	Difficulty Concentrating	9	36%

*Participants can vote for more than one complaint

Based on table 1. The majority of participants were in the age range of 31–45 years (68%). As many as 64% of the participants worked, all participants (100%) had *gadgets* with *smartphones.*

1. **Diagnostik Phase (Empathize & Define)**

   Based on the results of the initial screening through *the Digital Self-Reporting Questionnaire* (SRQ-20), it was found that 56% of participants (14 people) showed symptoms of mild psychological distress that manifested in sleep disorders and chronic fatigue. Physically, 80% of participants had a physical activity level in the "low" category according to WHO standards, mainly due to time constraints and lack of access to information about independent exercise at home.

Initial Screening

The pre-test screening was distributed to 25 participants using the Digital Skills Indicator instrument providing a key question: *"Have you ever used an app on your device to monitor your own health (such as step counting or meditation)?"* It was found that the majority of participants (17 or 68%) were at low levels of digital health literacy. This indicator is measured through the inability of participants to identify and operate self-health monitoring features on their devices.

2. **Technology Intervention Phase (Ideate & Prototype)**

The intervention was carried out through *an intensive Edu-Tech Workshop* which included a live demonstration of the installation of *the Google Fit* app for physical monitoring and *Riliv* for mental health. All participants (100%) successfully configured the device independently under the guidance of the team.

Knowledge Change Analysis (Quantitative Data)

The effectiveness of *Edu-Tech Workshop* was measured through a comparison of *pre-test* and *post-test* scores. The results show a significant surge in knowledge and skills related to the use of technology for health.

Table 2. Results of Knowledge and Skills Evaluation (n=25)

Evaluation Indicators	Rerata Pre-test	Rerata Post-test	Percentage Increase
Understanding Mental Health (Self-Help)	48,0	86,4	80%
Health App Use Literacy	35,2	92,0	161%
Independent Physical Activity Management	52,0	84,8	63%

Based on Table 2. showed the most drastic increase in literacy occurred in the aspect of using health applications on the technical skill indicator of gadget use, which jumped from an average of 35.2 to 92.0.

3. **Implementation & Test Phase**

Implementation

This stage was carried out in one intensive day designed to solve the 68% of low digital literacy found at the beginning. Participants were guided to install *Google Fit* and *Riliv*. The main focus is the synchronization of the phone's sensors for the pedometer feature and the user's profile settings.

Participants simulated a 100-meter walk to see how the app recorded steps in *real-time*. Furthermore, a 5-minute *Breathing Exercise* session was carried out using voice guidance from *the Riliv application* to reduce the symptoms of work stress previously reported by 60% of participants. Participants were also asked to compile a personal daily target (e.g., a target of 5,000 steps/day) which was input directly into the *Google Fit application.* Participants are required to do *daily check-in* by sharing screenshots of the steps from the application.

Testing & Evaluation

Remote monitoring or sustainability testing is carried out through WhatsApp groups. This stage was carried out to measure the effectiveness of the intervention using *Post-test instruments* and behavioral observation for 7 days after the activity. Post-test results showed an increase in the average score to 92.0. All participants (100%) successfully installed and were declared competent in operating *the Google Fit* health monitoring feature (step tracker) and breathing exercise guide application using *the Riliv* application independently.

The evaluation showed that 76% (19 people) actively reported screenshots of their daily step achievements. 60% (15 participants) actively used the breathing exercise feature before bed. This proves that the time barrier previously complained by 68% of participants (during the *Empathize stage*) was successfully overcome with a physical activity monitoring method that was integrated into daily activities.

Umpan Balik Peserta *(User Feedback)*

In a brief focus group discussion at the end of the session, one of the participants stated: *"It turns out that sports don't have to go to the field. With this app, I can monitor the number of steps while I'm working in the market or taking care of the house."*

This statement reflects a paradigm shift that technology can simplify physical health targets that were originally considered heavy to be more applicable in the daily lives of residents in the region.

Sustainability (Sustainability/Action Plan)

It is a "post-project" stage to ensure that participants' healthy habits are not lost, with the implementation of Routine, namely integrating the use of applications into the monthly routine agenda at Posbindu or PKK activities as well as Remote monitoring by continuing WhatsApp groups as a forum for digital health consultation.

DISCUSSION

This empowerment activity uses an *abridged version of Design Thinking*, allowing the service team to move nimbly without losing depth of analysis. The focus is not on lengthy theory, but on rapid prototyping that allows participants to directly experience the benefits of *m-health technology* in a matter of hours. not Sunday. The team managed to ensure that the selected application did not burden the phone's memory, namely *the Google Fit* application for daily physical activity monitoring and *the Riliv application* for mindfulness training. The selection of these two applications is based on the ease of the UI (User Interface) and UX (User Experience) interfaces as well as the availability of instructions in Indonesian, which is in accordance with the characteristics of the participants' digital literacy (Handoko et al., 2024).

In the team's view, the duration of one very intensive day is actually a "turning point" and a *critical success factor*. Women who have a double burden, long-term programs are often considered a "new burden." In contrast, a one-day intensive workshop creates a high focus momentum. In contrast to long-term programs that often experience a drop in motivation (*drop-out*) in the middle of the road, the one-day workshop model creates a positive momentum or digital culture *shock*. This emphasizes that the health empowerment model in sub-urban areas requires a shift from an educational strategy of "*push*" to "pull". By providing a self-monitoring tool such as *Google Fit*, participants have complete control over their health (autonomy) (Arumugam et al., 2021).

Based on demographic data, the majority of participants were in the age range of 31–45 years (68%) and the majority of 64% were working women, which explains why they often neglect structured physical activity for reasons of post-work fatigue. This age is the peak period of *double burden*, where women have to manage their careers as well as domestic affairs, so the risk of stress and sedentary lifestyles is higher (Bull et al., 2020). During this time it is also a high-risk group that requires specialized interventions, such as stress management programs, work flexibility, and healthy lifestyle health education to improve their quality of life (DiPietro et al., 2020).

These findings provide a strong sociological explanation for why structured physical activity is often overlooked. For this group, the main obstacle is not a lack of willpower, but rather a factor of physical and mental fatigue after completing working hours. This cumulative fatigue causes residual *energy to* no longer be sufficient to perform formal sports such as gymnastics or running. As a result, they are trapped in chronic sedentary behaviors that are a major risk factor for non-communicable diseases (NCDs) among productive age (Nugroho, 2023).

Conventional health education that imposes "30-minute structured exercise" becomes irrelevant to this group of workers. This is where the urgency of using *the Google Fit* application lies. With the background *tracking feature*, physical activity is no longer considered an additional burden, but rather an integration of active motion at work (e.g., walking to a meeting room or taking a flight of stairs). By looking at the achievement of steps on the device, the psychological burden due to the "necessity of exercise" is reduced, replaced by the satisfaction of achieving daily micro targets. This explains why after the intervention, physical activity levels continued to increase even though they still had the same workload.

The finding that all participants (100%) already have smartphones, but they are trapped in the phenomenon of *technological passivity*, where gadgets are only considered as entertainment tools, their use is still limited to communication (WhatsApp) and entertainment (Social Media), and has not been used for proactive independent health monitoring. This condition is rooted in a narrow perception of the function of gadgets and is a *missed opportunity* that considers smartphones as an "escape window" from routine, When gadgets are only used for entertainment, the potential for biometric data (such as footsteps, sleep patterns, and screen duration) is wasted. With intervention through *m-health applications* such as *Google Fit*, the service team seeks to change the status of the device from "digital distraction" to "health monitor".

The 80% increase in mental health understanding cannot be separated from the synergy between content and platforms. In this workshop, participants were taught breathing exercise techniques with deep *breathing patterns* for parasympathetic nerve activation. The implementation of this technique is made easier through the use of *the Riliv application*, which provides real-time audio and visual guidance. This helps participants perform exercises accurately without having to be physically accompanied by an instructor.

The level of digital self-efficacy of participants was measured using a validated Likert scale questionnaire. The results of the analysis showed a significant increase in the average score of self-efficacy which represented an increase of 138% after the implementation *of the Edu-Tech Workshop* is proof that the main obstacle is not the availability of technological infrastructure, but the absence of guidance (*mentorship*) to convert gadgets into health management tools. This is in line with the theory that digital self-efficacy only grows when users feel the direct benefits (utility) of features that were previously considered complicated

or unimportant (Suhada et al., 2025). Thus, the success of this program is not only measured by the increase in test scores, but also by the transformation of gadgets into instruments for empowering independent health.

The aspect of using health applications on the indicator of technical skill in the use of gadgets, which jumped from an average of 35.2 to 92.0. This shows that the intervention through hands-on demonstrations on *the Google Fit* and *Riliv applications* is able to solve the technical obstacles that have been experienced by participants. Before the intervention, most of the participants only used gadgets for social communication. The spike *in post-test* scores on the mental health aspect (from 48.0 to 86.4) proves that participants have a high level of curiosity about their psychological condition, but have been constrained by stigma if they have to consult face-to-face. Through technology, the screening process becomes more private and secure for them.

The high initial complaints in the form of difficulty sleeping (56%) and muscle pain (72%) in participants were significantly reduced through the new skills acquired. By routinely doing *Breathing Exercises* via *the Riliv* app before bed, participants reported an improvement in rest quality, while the step targeting feature in *Google Fit* helped participants reduce muscle stiffness due to sedentary behavior during work.

This success is in line with the *theory of Micro-Health Intervention*, in which women of productive age are more responsive to "small but routine" education than long-duration seminars (Hassanzadeh et al., 2025). The *micro-learning approach* given during the workshop allows information to be absorbed without triggering *cognitive overload* for participants who are tired of domestic and work routines. This is also supported by the *Technology Acceptance Model* (TAM) which states that perceived *usefulness* and *perceived ease of use* are the keys to technology adoption (Nurista et al., 2025).

Based on the observation of the practice sessions, participants felt proud when they successfully synchronized their footsteps to the app. This pride transforms into an intrinsic motivation. Women's empowerment at the rural level such as in Blabak village, Kandat district, Kediri Regency is no longer effective if it only uses the lecture method. They need "instant proof" of their own health data (such as step counts or heart rate charts) to believe that healthy living is easy and measurable.

This success is not only due to the sophistication of the application, but also because of the process *of demystification* of technology which is the process of eliminating complexity, fear, and misunderstanding around medical digital innovations (such as AI, *telemedicine*, or *wearable devices*) to make them easier to understand, trust, and adopt by medical personnel and patients (Versatile, 2022). Through this activity, we succeeded in changing the participants' view from "health technology is complicated" to "health technology helps".

Through a hands-on demonstration of using *the Google Fit* app, participants realized that domestic activities such as sweeping, walking to the market, or taking care of the household can be converted into valid health data. Participants who initially felt they didn't have time to exercise now have a new perspective that the goal of 5,000 steps a day is a realistic goal and can be monitored at no additional cost.

The implementation of *the Riliv* application in this workshop provides a practical theoretical basis for *Micro-Mindfulness*. Unlike conventional stress management seminars that are theoretical, the Indonesian guided meditation feature in this application allows participants to terminate stress within 5 minutes in between busy schedules. This is in line with the theory that emphasizes that the success of *m-health* adoption in productive women is highly

dependent on *perceived usefulness* that is felt instantly in reducing daily anxiety (Puente-Torre et al., 2025).

Participants are also more consistent in doing breathing exercises when using the reminder feature on the *Riliv application*. This proves that technology plays a role as a 'personal health assistant' that maintains the independent discipline of participants. The success of increasing mental health understanding (93%) is driven by the privacy factor that digital technology offers. The theory of *Digital Empowerment* states that women are more likely to be honest about their psychological state when dealing with digital instruments than face-to-face consultations due to the lack of risk of social stigma (Nurmaya & Amiruddin, 2025).

The fact that 76% of participants remained active in reporting their health progress in WhatsApp groups for 7 days post-activity shows that technology has succeeded in creating new social capital. This condition is in accordance with the theory of *digital peer-support (digital peer-support*) is a determining factor whether a new habit will settle in or disappear. The group serves as a validation space where fellow productive women give each other appreciation for their colleagues' small achievements, which is psychologically very empowering (Yeo et al., 2023). The success of 76% of participants in reporting their progress via WhatsApp post-activity is a fact that technology has transformed into social *capital* that increases competitive motivation in a healthy manner among citizens.

The synthesis of this community service is that the Blabak Health Center has a large asset in the form of a population of women of productive age who are gadget literate. The problem of "double burden" which is often blamed as the cause of women's poor health can be reduced if health centers are able to provide inclusive digital education channels. The future of health promotion in this region is no longer in the waiting room of the health center, but in the hands of every resident through an application that is integrated with the monitoring of local health workers (Aprillia et al., 2025).

Sustainability of motivation still requires external validation. This is where the important role of the Blabak Health Center as a digital supervisor is. We argue that the WhatsApp group formed is an asset of the "Digital Posyandu" that can be further developed. According to Utami (2024), it supports that virtual communities that have the same geographical attachment (one Puskesmas area) have a much higher level of activity sustainability than anonymous virtual communities.

CONCLUSION

Empowerment of women of productive age through the application of *the Design Thinking* method through *the one-day Edu-Tech Workshop* is effective in improving the digital literacy of women's health of productive age. The use of *Google Fit* and *Riliv* applications has proven to be a practical solution in overcoming time constraints and work stress. This has been shown to consistently monitor post-activity self-paced physical activity, signaling a positive transition from sedentary behavior to a more digitally active lifestyle. This program is a new paradigm of health promotion that is adaptive to the dynamics of modern women's lives and community service strategies in the digital era.

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