

# Human pregnancy and birth: The enrichment of a booklet with medicinal plants for postpartum wellness

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**Abstract:** The complexity of the reproductive system necessitates instructional media to facilitate comprehension, as its processes unfold internally and are not readily observable. This study aims to assess the viability of booklet sub-materials on fertilization, gestation, and childbirth, derived from the inventory findings of medicinal plants for postpartum care, as educational resources. The research and development used the Borg & Gall model which included identifying potential problems, data collection, product design, design validation, and product revision. The booklet media underwent validation by five validators using validation sheets, while the evaluation criteria encompassed format, content, and language proficiency. The validation data were analyzed using CVR (Content Validity Ratio) and CVI (Content Validity Index). The results of the booklet media validation obtained a CVR value on each criterion of 1.00 with a valid category and a CVI value of 1.00 with a valid category. The booklet on the subject of gestational fertilization and childbirth from the results of the inventory of medicinal plants for postpartum is suitable for use as a learning media.

**Keywords:** booklet; learning media; reproductive system

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## Introduction

Learning is a continuous process that individuals undertake to achieve their expected objectives. Four main components, namely teachers, students, learning materials, and the environment are involved in this process (Cincera et al., 2020; Novitasari, 2022). A professional teacher not only offers educational resources but also creates and implements innovative learning media (Akayoğlu et al., 2020; Falloon, 2020). Preparing innovative learning media is a significant indicator of teacher professionalism, as it encompasses the development of various competencies and readiness for innovative activities, which are crucial in the modern educational landscape. The ability to create edutainment-based media, for instance, not only demonstrates a teacher's skill in making innovative learning materials but also contributes to their professional development by enhancing their ability to engage students effectively (Bucciarelli & Mughini, 2018; Cholifah et al., 2020; Divinska, 2022; Mitina, 2020; Naumkin et al., 2022; Tsiuniak et al., 2022; Welter et al., 2022).

Learning media is a tool used in the education system to distribute information to students (Cholifah et al., 2020; Dwianto et al., 2017; Panjaitan et al., 2021; Paramita et al., 2019). An effective learning media should be comprehensible and not contain any uncertainty to be efficacious. In Indonesia, using appropriate Indonesian spelling in educational materials indicates effective written communication. Proper Indonesian spelling can facilitate students' understanding (Linda et al., 2021). Learning materials presented in an engaging and comprehensible manner can aid students in understanding the concepts (Apriani et al., 2021; Arifah et al., 2021; Sari et al., 2021; Wahyuni et al., 2022; Winarni, 2020). Selecting interesting and appropriate media can enhance students' motivation, curiosity, and learning outcomes (Djannah et al., 2020; Muninda et al., 2021; Octaviana et al., 2021; Wulandari et al., 2023; Yudasmara

& Purnami, 2015)

In addition, the validation process is necessary before using the learning media that has been created for learning purposes. The aim is to assess if a media is appropriate or qualified for use in the educational process. The validation process plays a crucial role in enhancing the effectiveness of innovative learning media by ensuring that the developed tools are not only innovative but also valid, reliable, and suitable for the intended educational purposes (Habibi & Agustini, 2022; Kumar et al., 2019; Nikmah et al., 2019; Tamami et al., 2022). The validation process significantly influences the effectiveness of innovative learning media by ensuring their validity, appropriateness, and alignment with educational goals, thereby enhancing learning outcomes and student engagement (Ardi et al., 2023; Oktavianah, 2022). The eligibility of a media being developed can be assessed based on how well the content aligns with the fundamental competencies, indicators, and learning objectives.

The fundamental competencies in biology learning entail comprehending key biological concepts, including cellular structure, genetics, evolution, and ecological principles, alongside fostering skills in scientific inquiry, data analysis, and critical thinking to interpret biological phenomena effectively. One of the topics taught in biology learning is the reproductive system. While, the reproductive system material requires learning media to improve students' understanding and learning outcomes. Learning media is necessary for delivering this material as it involves internal body processes that cannot be directly observed, which makes it challenging for students (Agustini et al., 2021; Ardi et al., 2023; Astatin & Nurcahyo, 2016; Muninda et al., 2021; Prasetyo et al., 2022; Puspita et al., 2017; Syamsurizal et al., 2021). Various studies have shown the effectiveness of different learning media in enhancing students' cognitive learning outcomes in biology subjects related to the reproductive system (Eliana et al., 2022; Ibrahim, 2023; Kurniawan et al., 2018; Panjaitan et al., 2020; Roihana et al., 2018). The integration of audio-visual media, such as Al-Quran integrated audio visual media, has also been shown to have a positive impact on student learning outcomes in reproductive system materials (Aglillah & Jayanti, 2022). Moreover, employing video and flashcards as instructional tools proves efficacious in enhancing student engagement and academic achievements in the human reproductive system (Roihana et al., 2018). Furthermore, the use of virtual anatomy system (VAS) media with an inquiry approach has been highly effective in improving students' analysis ability to understand the reproductive system (Winarni, 2020). An interactive learning videos have been developed as an effective learning media to improve student learning outcomes in the human reproductive system, especially in distance learning settings (Ibrahim, 2023). The use of E-Booklet as a learning media has been found to significantly improve students' cognitive learning outcomes in the human reproductive system (Eliana et al., 2022).

Booklets are an effective media for learning (Ardi et al., 2023; Intika, 2018; Panjaitan et al., 2021; Panjaitan & Tenriawaru, 2022; Syamsurizal et al., 2021). Providing booklets that contain crucial information alongside picture illustrations will enable students to comprehend the material with ease (Pralisaputri et al., 2016). The design of the booklet is straightforward and clear, yet it maintains variety by utilizing language that is both communicative and easy to comprehend. An attractive booklet design will motivate students to focus more on learning (Apriyeni et al., 2021; Ardi et al., 2023). Booklets are arranged systematically to support their roles and functions in realizing effective learning (Paramita et al., 2019) and make it easier for readers to understand the information presented. Booklets offer the benefit of being usable in any location without requiring a power source. Using booklets in a lesson can increase students' understanding of the material (Imtihana et al., 2014) and learning outcomes (Eliana et al., 2022; Intika, 2018; Puspita et al., 2017).

However, the limited research on the development of learning media based on local wisdom poses a significant challenge in the realm of education. While local wisdom often encapsulates rich cultural values and knowledge, research exploring its application in learning contexts remains relatively scarce. There is a pressing need for greater efforts to support research focused on harnessing local wisdom in the development of learning media that is relevant and meaningful to local communities. By engaging local communities and leveraging locally available resources, instructional media can be created to not only unearth cultural heritage but also positively contribute to students' learning experiences, enhancing their understanding of local environments and traditions. The synergy between local wisdom and modern technology in the development of instructional media can pave the way for a more inclusive and sustainable educational approach.

Some examples of media developed from the local wisdom research include the development of a pocketbook from the exploration of medicinal plants of the Rejang tribe, Merigi District, carried out by Windayani et al. (2018), eligibility of sub-material magazine media for the use of Indonesian biodiversity based on family medicinal plants carried out by N. L. Lestari et al. (2021) and the suitability of sawi Dayak (*Elephantopus mollis* Kunth) booklet media in biology learning carried out by Panjaitan and Tenriawaru, (2022). The use of medicinal plants to maintain health and overcome health problems still needs to be developed, considering the high cost of treatment and the price of medicines (Efremila et al., 2015). One form of traditional medicine that is still used by the community is the use of medicinal plants for postpartum. The practice of using traditional medicine by the community has become an integral part of the community's culture and traditions which are passed down from generation to generation. Although

information regarding the use of medicinal plants exists among the public, this information has not been well documented. Therefore, it is important to specifically identify medicinal plants used by the community. One way to reveal the use and diversity of traditional medicinal plants is through an inventory process.

The booklet media developed in this research contains the results of an inventory of postnatal medicinal plants in Pasti Jaya Village. This booklet can be an alternative learning media on the sub-materials of fertilization, gestation, and childbirth and can increase students' knowledge regarding the local wisdom of the community regarding the use of medicinal plants. This research aims to determine the suitability of the sub-material booklet on fertilization, gestation, and childbirth from the results of an inventory of medicinal plants for postpartum as a learning media.

## Method

This research and development using [Borg and Gall \(1983\)](#) that was limited to the fifth stage. The stages are: (1) identifying potentials and problems related to the use of learning media and local wisdom of the community in the use of medicinal plants; (2) collecting data on medicinal plants used for postpartum in Pasti Jaya Village and collecting information for the development of fertilization sub-materials pregnancy and childbirth; (3) designing products; (4) designing validation conducted by five validators using a validation sheet consisting of three aspects, namely format, content, and language aspects; (5) designing revisions are made according to the validator's suggestions. The validation data were analyzed using the Content Validity Ratio (CVR) to determine the suitability of the criteria on the item with the aspects measured based on the assessment of the experts or validators, and the Content Validity Index (CVI) to illustrate that overall, it has good content validation. The content validity analysis refers to [Lawshe \(1975\)](#). The critical value of CVR is 0.99, which means that the media is declared valid if the CVR value is equal to or greater than the critical value of 0.99. The [Formula \(1\)](#) is used for calculating the CVR.

$$CVR = \frac{ne - \frac{N}{2}}{\frac{N}{2}} \quad (1)$$

Description:

CVR = Content Validity Ratio

ne = Number of validator panelists who agree on the validity of the media

(considered to be in agreement if the criterion value reaches 3 to 4, if less than 3 then considered to be in disagreement)

N = Total number of validator panelists

After obtaining the CVR value of each criterion, the CVI (Content Validity Index) value is calculated. The CVI value is obtained using the following [Formula \(2\)](#).

$$CVI = \frac{\sum CVR}{\sum n} \quad (2)$$

Description:

n = Number of items in all aspects

(If the CVI value is between 0 and 1, the medium is considered good or feasible).

## Results and Discussion

### Identifying Potential and Problems

The tradition of the people in Pasti Jaya village of using traditional plants to make medicinal plants for postpartum, which has been passed down from generation to generation and is still maintained, is a potential of the community in Pasti Jaya village. However, this knowledge remains confined to the community and lacks thorough documentation. One way to uncover the usefulness and diversity of traditional medicinal plants is through inventory ([Panjaitan et al., 2021](#); [Paramita et al., 2019](#)).

Conversely, reproductive system material requires learning media in its delivery because it involves processes that occur in the body and cannot be seen directly, making it difficult for students to understand. One of the effective media used in learning is booklets ([Imtihana et al., 2014](#); [Intika, 2018](#); [Puspita et al., 2017](#)). Booklets, as versatile educational tools, have shown significant potential in enhancing the learning experience of students, particularly in understanding complex subjects like the reproductive system. The development of an E-Booklet for reproductive system materials has been proven to improve students' cognitive learning outcomes significantly, as evidenced by a study where the average posttest scores of students increased dramatically after using the learning media ([Eliana et](#)

al., 2022). The transition to online learning has necessitated the creative delivery of material through digital learning media, including digital booklets, which have been found to be very effective in facilitating learning and assisting students in understanding complex scientific material. Apart from encompassing pre-existing material concepts found in textbooks, educational resources can also be formulated through research findings. The development of booklets based on field research or observations, such as those on medicinal plants, demonstrates the feasibility and effectiveness of booklets as learning media (R. K. Dewi et al., 2022). The booklet developed in this study contains sub-materials on fertilization, pregnancy, and childbirth, as well as the results of the inventory of postnatal medicinal plants in Pasti Jaya village.

### Data Collection

Data collection in this study was based on the results of an inventory of medicinal plants used for postpartum in Pasti Jaya village and collecting information on the sub-materials of fertilization, pregnancy, and childbirth. This phase begins with the collection of plant data through interviews, observation, and plant documentation. The next stage is the collection of plant samples for the herbarium. Plant identification was done at the Biology Laboratory, Faculty of Mathematics and Natural Sciences, Universitas Tanjungpura.

### Product Design

The preparation of the booklet begins with the analysis of the basic competencies, the booklet design, the guidelines, and the production process. The competencies are analyzed based on the syllabus of Biology Class in eleventh-grade Reproductive System material to determine the sub-material that will be used as a reference in compiling indicators of competency achievement and learning objectives. The preparation of the booklet design begins with determining the shape and size of the booklet, determining the type and size of the booklet font, determining the content of the booklet, guiding the booklet design, and producing the booklet. The booklet was made in A5 size (14.8 cm x 21 cm) with 52 pages in portrait orientation and bound like a book. The typeface used in this booklet is a combination of Serif and Sans serif fonts, namely Montserrat, Brice bold condensed, Questrian, and Serif in sizes ranging from 10-30 points. Montserrat, Brice bold condensed, and Questrian are used on the cover, while Serif fonts are used in the discussion section (Figure 1). The components in the booklet are organized into several sections, namely the introduction, body, and conclusion. The introduction includes a cover, a preface, and a table of contents (see Figure 2).



Figure 1. Use of font type and size in the booklet (in Bahasa)



Figure 2. The introduction section of the booklet contains (a) cover, (b) preface, (c) table of contents (In Bahasa)

The content section contains basic competencies, indicators, and learning objectives for fertilization, pregnancy, and childbirth sub-materials, as well as the results of the inventory of medicinal plants for postpartum in Pasti Jaya village (Figure 3). The closing section contains a glossary, index, and bibliography (Figure 4). The prepared booklet design is first discussed with the supervisor before printing. The booklets in this study were designed using the Canva application. After receiving the appropriate design, the booklet will be printed using art paper for the cover and art paper for the contents.

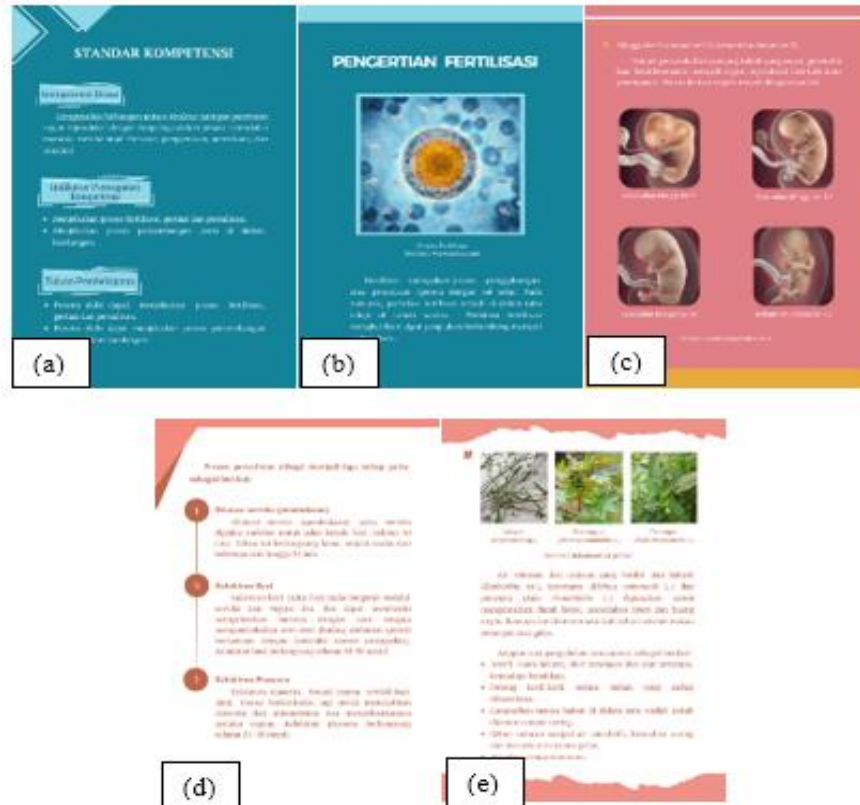


Figure 3. The content section of the booklet. There are (a) competency standards, (b) discussion of fertilization, (c) discussion of pregnancy, (d) discussion of childbirth, (e) discussion of the results of the inventory of postnatal medicinal herbs in Pasti Jaya village (In Bahasa)



Figure 4. The final section of the booklet. There is (a) table of contents, (b) glossary, (c) indeks (In Bahasa)

## Product Validation

The booklet media is validated first to determine its suitability as a learning media. The results of the validation and data analysis can be seen in [Table 1](#). From the validation results, the CVR value for each criterion was 1.00, which means that each criterion for the three aspects is valid. The achievement of a CVI value of 1.00 indicates that the booklet media developed is suitable for use as a learning resource specifically tailored to the sub-topics of fertilization, gestation, and childbirth. This perfect score suggests that the content, format, and overall design of the booklet effectively align with the objectives of teaching these concepts, ensuring that it can effectively facilitate understanding and engagement among learners.

Table 1. Results of validation and data analysis of booklet.

Aspect	Criterion	Validator Sequence Number-					CVR	Annotation
		1	2	3	4	5		
Format	1. Eligibility of size, number of pages and letters (type and size) used.	4	4	4	4	4	1,00	Valid
	2. Completeness and systematic presentation of booklet components.	4	4	4	4	4	1,00	Valid
	3. Attractive booklet cover design.	3	4	4	4	4	1,00	Valid
	4. Practicality of booklet media.	4	4	4	4	4	1,00	Valid
	5. Conformity between the sub-material in the booklet and basic competencies, competency achievement indicators, and the learning objectives to be achieved.	4	4	4	4	4	1,00	Valid
Content	6. Truth and accuracy of the contents of the booklet (no misconceptions)	4	4	4	4	4	1,00	Valid
	7. The content (material) presented in the booklet is up-to-date (using literature from at least the last 10 years).	3	4	4	4	4	1,00	Valid
	8. Complete coverage of the material presented in the booklet.	3	4	4	4	3	1,00	Valid
	9. Accuracy in language use.	3	4	4	4	4	1,00	Valid
Language	10. The writing procedure is in accordance with the rules of the General Guidelines for Indonesian Spelling.	4	4	4	4	4	1,00	Valid
CVI = 1,00								Valid

Annotation : CVR = Content Validity Ratio dan CVI = Content Validity Indeks

## Format Aspect

The format aspect measured consists of four criteria, namely suitability of size, number of pages and letters (type and size) used, completeness and systematic presentation of booklet components, attractiveness of booklet cover design, and practicality of booklet media. The first criterion, namely suitability of size, number of pages, and letters (type and size) used, obtained a CVR value of 1.00 in the valid category. The booklet developed is A5 size and has 52 pages. These results are in line with [N. Dewi et al. \(2018\)](#) which indicates that the provisions for the size and number of booklets are 14.8 cm x 21 cm or equivalent to A5 size with several pages of no more than 100 pages. The choice of letters used in the booklet is adequate and the content can be read clearly. Using an attractive and easy-to-read typeface is the key to conveying information effectively.

The second criterion, namely the completeness and systematic presentation of the booklet components, obtained a CVR with a value of 1.00 in the valid category. The booklet in this study has complete components and a coherent systematic presentation, including cover, foreword, table of contents, competency standards, sub-material on fertilization, gestation, and childbirth, and contains the results of an inventory of postnatal medicinal plants in Pasti Jaya Village as well as a bibliography, glossary, and index (see [Figure 5](#)). This is in line with [Paramita et al. \(2019\)](#) which states that the systematic preparation of booklets can support their role and function in assisting effective learning. Apart from that,

the systematic preparation of booklets will make it easier for readers to understand the information.



Figure 5. Parts of booklet (in Bahasa)

The third criterion, namely the attractiveness of the booklet cover design, obtained a CVR value of 1.00 in the valid category. The designed booklet cover has an easy-to-understand title that represents the contents of the booklet and displays the author's name (see Figure 6). This is to what was stated by Panjaitan and Tenriawaru (2022), that learning media covers have easy-to-understand titles that represent the contents of the booklet and include the author's name. An attractive booklet design can arouse students' interest in studying it (Apriyeni et al., 2021; Ardi et al., 2023; R. K. Dewi et al., 2022; Eliana et al., 2022).



Figure 6. Display of cover on the booklet (in Bahasa)

The fourth criterion, namely the practicality of the booklet media, obtained a CVR value of 1.00 in the valid category. The booklet is designed to make it easy to use and can be carried anywhere and stored easily. The opinion to Bagaray et al. (2016), one of the benefits of using print-based learning media in the form of booklets is that it is practical because it can be used anywhere and anytime and does not require an electricity source. Apart from that, easy access to booklets can help improve students' understanding of the material and learning outcomes (Eliana et al., 2022; Intika, 2018; S. Lestari et al.,

2020; Panjaitan et al., 2021). The practicality of media is an important aspect that describes how easy it is to use the media so that it can support effective learning.

### **Content Aspect**

The assessment of content involves four criteria. Firstly, it evaluates the alignment of sub-materials in the booklet with competencies. The alignment of sub-materials in the booklet with basic competencies, indicators, and intended learning objectives achieved a CVR value of 1.00, indicating validity. The contents of the booklet are designed to align with basic competencies, indicators of competency achievement, and intended learning objectives. Basic competencies represent the fundamental skills that students must acquire, while indicators serve as markers of the attainment of these basic competencies, guiding the formulation of learning objectives. The learning objectives are a written representation of the mastery of competencies that students are expected to achieve after following the lesson. In line with the opinion of Ayu et al. (2021) which states that the suitability of material with basic competencies, indicators, and learning objectives is one indicator of the suitability of learning media.

Secondly, it ensures the accuracy and absence of misconceptions in the booklet's content. It obtained a CVR value of 1.00 in the valid category. The content presented in this booklet is correct and accurate so that it does not lead to misconceptions. One aspect of assessing learning media is the truth of the content of the material which must be free from conceptual misunderstandings (misconceptions). Education and literacy play a crucial role in preventing the spread of misconceptions through booklets. By providing accurate and evidence-based information, educational booklets can help dispel myths and misconceptions, leading to better understanding and informed decision-making (Apriliyani et al., 2022; Hegazy et al., 2020). Thirdly, it verifies that the content presented in the booklet is current and up-to-date. The content should be up-to-date and utilize literature from the past decade. The CVR value is 1.00 in the valid category. The information in this booklet uses up-to-date literature from sources with a level of novelty in the last ten years of more than 80%.

Finally, the booklet provides comprehensive coverage of the material presented in it reaching a CVR value of 1.00 in the valid category. The booklet designed for this research contains information regarding fertilization, gestation, and childbirth as well as the results of an inventory of post-natal medicinal herbs in Pasti Jaya Village. One aspect of assessment in learning media is the completeness of the material presented by the media. In line with the opinion of Panjaitan and Tenriawaru (2022), who revealed that information that is presented completely in learning media and is easy to understand will help students understand the concept of knowledge.

### **Language Aspect**

The language aspect measured consists of two criteria, namely accuracy in language use and writing procedures following the rules of the general guidelines for Indonesian spelling. The first criterion, namely accuracy in language use, obtained a CVR value of 1.00 in the valid category. The language used in this research booklet is easy to understand, and clear and does not give rise to multiple interpretations. In line with the opinion of Panjaitan et al. (2021), who stated that learning media is said to be effective if it uses language that is easy to understand, clear, and does not raise doubts in its interpretation.

The second criterion, namely the use of sentences by the rules of General Guidelines for Indonesian Spelling, obtained a CVR value of 1.00 in the valid category. The use of sentences in the booklet in this study follows the rules of general guidelines for Indonesian spelling (see Figure 7). As stated by Paramita et al. (2019), the use of language that meets general guidelines for Indonesian spelling provisions in learning media is one of the criteria for the effectiveness of written communication. In line with the opinion of Linda et al. (2021) which states that the use of language that meets general guidelines for Indonesian spelling provisions will help readers understand the information conveyed.

### **Design Revisions**

The booklet was revised according to validators' feedback to enhance its quality and ensure it becomes a better product. Following the validation process, several comments and suggestions were gathered. These include consolidating multiple images under a single reference (Figure 8), updating references with publication years older than ten years, expanding the number of references to exceed ten, enhancing image captions to provide supplementary information (Figure 9), and adjusting the language used, which occasionally features brevity or narrative style (see Figure 10). The design revision stage significantly impacts the overall success of a by ensuring continuous improvement and refinement (Arifin et al., 2022; Panjaitan & Tenriawaru, 2022; Reinerfelt, 2019). Design revision is crucial in creative work, such as booklet projects, as it allows for the enhancement of initial ideas and the correction of errors (Hevner & Storey, 2021). Neglecting the revision stage can result in suboptimal results and missed opportunities for improvement.



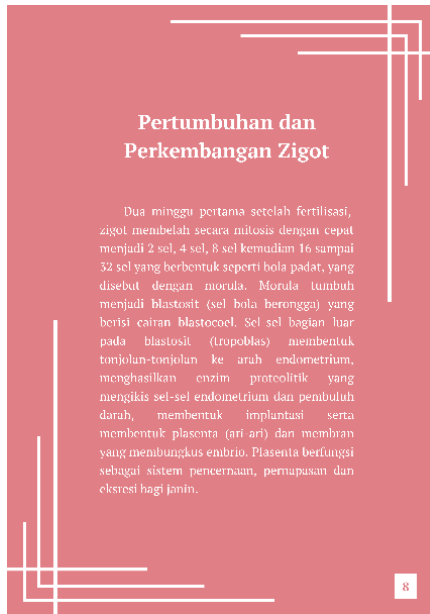


Figure 7. Language presentation in booklet (in Bahasa)

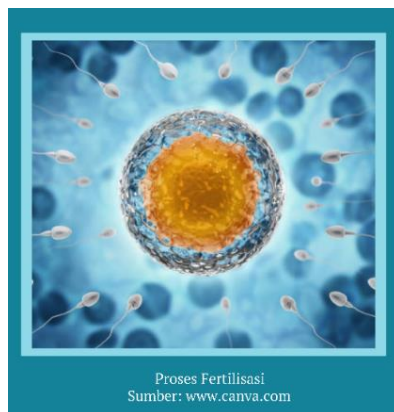


(a) Before



(b) After

Figure 8. Improved writing of image reference sources in the booklet (in Bahasa)



(a) Before



(b) After

Figure 9. Improved image captions in booklet (in Bahasa)



Figure 10. Improved language use in booklet (in Bahasa)

The current focus of the research and development is on the revision phase, with the learning media yet to undergo testing. While revisions have been made based on feedback from validators, the media has not been extensively field-tested. Thus, the next step will involve conducting trials of the booklet in authentic learning settings to assess its efficacy in facilitating understanding of fertilization, gestation, and childbirth. This process aims to enhance the booklet's effectiveness as a robust learning resource aligned with educational objectives.

## Conclusion

The sub-material booklet focusing on the processes of fertilization, gestation, and childbirth, which was developed based on information gathered from the inventory of medicinal plants utilized in postpartum care, demonstrated exceptional validity with a CVR value of 1.00 for every criterion assessed. This signifies that the content and structure of the booklet effectively align with the intended learning objectives and competencies, ensuring its suitability as an educational resource in the context of reproductive health education. The booklet can be deemed suitable for use as a learning resource. However, additional trials are necessary to ascertain the effectiveness of the booklet as a teaching tool for eleventh-grade students in senior high school, specifically focusing on fertility and childbirth topics.

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## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

## Author Contributions

**W. Hartika:** writing original draft preparation, review, and editing. **R. G. P. Panjaitan:** writing original draft preparation, review, and editing. **A. B. Tenriwaru:** methodology and analysis;

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