

ORIGINAL ARTICLE

Development of “Moroca” as a Learning Media for Reproductive Health Services in Disaster Situations

Rati Purnama Sari¹, Yuliva¹, Alsri Windra Doni¹, Ira Maisarah²¹ Department of Midwifery, Poltekkes Kemenkes Padang, 25146, Padang, West Sumatera, Indonesia² Faculty of Language and Arts Education, University of Bengkulu, 38371, Bengkulu, Indonesia

ABSTRACT

Introduction: Due to its geographical, geological, and demographic conditions, Indonesia is facing the risks of natural disasters such as floods, landslides, earthquakes, and volcanic eruptions. Midwives as health workers have a strategic role as providers of reproductive health services, including in disaster situations. This study aims to develop learning media for reproductive health services in a disaster situation based on the monopoly game. **Methods:** The research employed research and development (R&D) design. The development of learning media for reproductive health services in disaster situations is based on the monopoly game, which consists of the following steps: seeing the potential and problems, data collection, product design, validation by experts, product trials, and product revisions. **Results:** The learning media is named “Moroca” (*Monopoli Kesehatan Reproduksi pada Situasi Bencana / Monopoly of Reproductive Health Services in Disaster Situations*). Validation was carried out by two experts and the media was declared feasible and valid for use. The product trial was conducted on 22 students of Midwifery Program. The statistical test used the Wilcoxon test. The results of the analysis showed that there was a significant increase in the level of knowledge about reproductive health services in disaster situations among students after using “Moroca”. **Conclusion:** Learning media is needed to increase the knowledge and skill of the students. Moroca is can be used as one of the alternative media in education for midwifery students.

Malaysian Journal of Medicine and Health Sciences (2023) 19(2):145-150. doi:10.47836/mjmhs19.2.22

Keywords: Health education, Learning media, Reproductive health, Disaster management, Health crisis situations

Corresponding Author:

Rati Purnama Sari, M.Tr.Keb

Email: ratipurnamasariab@gmail.com

Tel: +6282285228031

INTRODUCTION

Due to its geographical, geological, and demographic conditions, Indonesia is facing the risks of natural disasters such as floods, landslides, earthquakes, and volcanic eruptions. Based on data from Indonesian National Disaster Management Authority, until 2020, there have been 207 disasters, ranging from storms, floods, landslides, forest fires to high tides. Compared to data from the previous year, there was an increasing trend of disaster impacts (1).

Reproductive health services are still an issue that has not become a priority for disaster management. The evaluation of the refugees from the Merapi eruption showed several reproductive health problems. The United Nations Population Fund (UNFPA) reported that 25 percent of female refugees were of reproductive age. A study on the post-earthquake in Lombok showed

some mothers did not carry out antenatal care. Worries and trauma due to aftershocks were the main reasons mentioned by the respondents (2). As many as 2 percent of the refugees were reported as experiencing sexual violence. Miscarriage, unsafe abortion, experience violence, sexual harassment, contraception distribution problems and other pregnancy problems could happen in disaster situations (3,4).

Cross-sectoral coordination is not optimal and not all trained health workers provide services in disaster situations (4). Midwives as health workers have a strategic role as providers of reproductive health services, including in disaster situations (5). In line with this, not all regions have a special team as the provider of reproductive health services in disaster situations in refugee camps. Optimal reproductive health services require professional and competent officers in these situations (4). Midwifery education is a place to prepare prospective midwives who are competent and able to provide optimal services (6).

The learning method commonly used is lecture or question and answer discussion. Learning media is one

of the factors that influence the effectiveness of learning. The media affect the motivation, interest, and attention of students (7). The use of games in learning can be more effective for learning helpful than conventional methods (8). The use of games as a medium of learning in the medical world has has been begun to be recognized. A systematic review shows that based on the results of several studies, the use of games as a medium of learning is known to have a positive effect (9). Education games are expected to create a more relaxed and more effective atmosphere. Monopoly is one of the games that are widely used as media learning. The game is interesting and can be played easily, making Monopoly one of the most widely known games in the world. Monopoly has the potential to be developed as an alternative learning media. Learning media in the form of games can be played repeatedly by students. The use of monopoly has also been used at various levels of education such as biology, mathematics, physics, and various levels of education (elementary, junior high, high school, to university level. The development of monopoly in several scientific fields shows the feasibility of the game as a learning medium (10–12). Development of monopoly as a learning media show a positive effect in terms of motivation and learning outcomes compared to conventional learning methods without using the media (13). Besides increasing knowledge, learning using media and game methods can also increase students' interest in learning and creativity (14). The use of a modified board game called "AFTERSHOCK" in medical topics during a disaster for medical students in Germany showed positive results and high levels of acceptance and pleasure in learning using this game (15).

Based on the observations and interviews with lecturers, there was no an innovative learning media used in learning. During the Covid-19 pandemic, midwifery students underwent lectures through the online system, students were less enthusiastic and active in studying learning materials provided by lecturers online. This prompted the authors to develop an innovative learning media. This study aims to develop learning media for reproductive health services in a disaster situation based on the monopoly game.

MATERIALS AND METHODS

This study used the research and development design. It consist of the following steps: the analysis of potentials and problems, data collection, product design, validation by experts, product trials, and product revisions. The research was conducted between March and November 2021. The method of this study is research and development research (R&D). The study aims to produce a product and test the feasibility of the product. Learning media as a product was developed and validated by experts (16,17). The technical implementation of this research is shown in the flow chart in Figure 1.

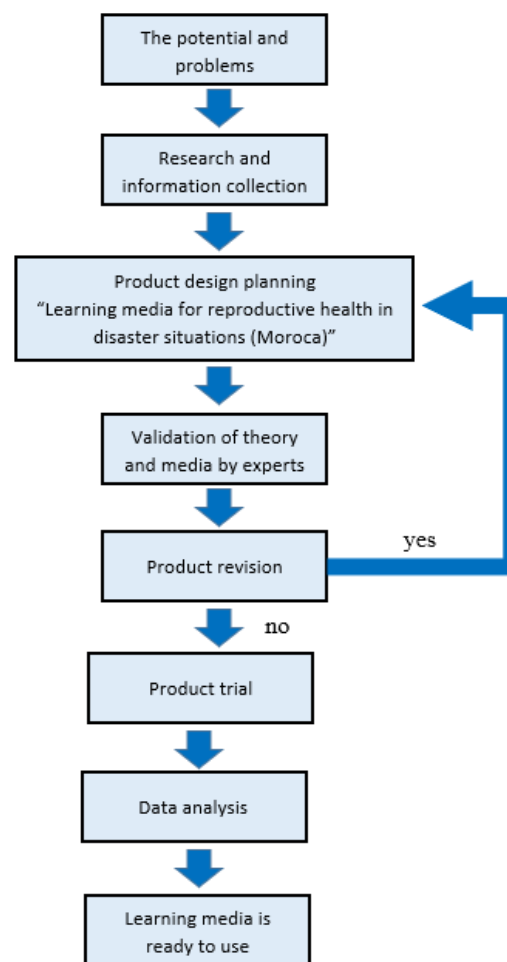


Figure 1: Research Flowchart

The design began with the collection of references and model designs from manuals issued by the Ministry of Health and UNFPA, applicable regulations, and other sources relevant to the design product. The design is made in the form of a blueprint which is an outline of the content of the monopoly which includes templates and materials. The monopoly was then named the name Moroca (Reproductive Health Monopoly in Disaster Situations). The game adopts the design of monopoly, which consists of a monopoly board, monopoly components, ownership cards (consisting of areas in the province of West Sumatra), challenge cards, and help cards (in the form of questions about reproductive health service materials in disaster situations). A manual comprising game instructions and materials consisting answers to the questions listed on the challenge and help cards is compiled. The Moroca handbook was prepared by referring to the Guidelines for the Implementation of the Minimum Initial Service Package (MISP) for Reproductive Health in the Health Crisis in 2017 (18). The beginning of the book contains instructions and game rules. The next section contains material about the answer key to the questions on the challenge and aid cards of Moroca. Furthermore, the researchers was

assisted by an expert to compile the Moroca design, and the cover of the guidebook was assisted by a graphic designer expert so that the display became more attractive. The ethic approval for this study was obtained from the research ethics committee of medical faculty, Andalas University, No: 392/UN.16.2/KEP-FK/2021).

The Moroca game and the manual were then validated by two experts, an expert on reproductive health services in disaster situations and an expert on learning media. The assessment uses a validator assessment sheet which contains a review of the product's conformity with the theory of reproductive health services in disaster situations and the appearance of the design. The assessment points are verification, the actuality, academic usefulness, feasibility of use, and interest in the display. The suggestion of experts was a reference to serve as a reference for making improvements. After the revision, the last step is product trial in small group. Midwifery students of Poltekkes Kemenkes Padang, became respondents in the product trial. To assess knowledge before and after the game, students fill out a questionnaire containing the knowledge contained in the game.

RESULTS

Product description

The game was then given the name Moroca (Reproductive Health Monopoly in Disaster Situations). The basic designs employs the monopoly board, monopoly components, ownership cards (consisting of areas in the province of West Sumatra), challenge and help cards (in the form of questions about reproductive health service materials in disaster situations). The Moroca board is printed in 1 x 1 meter size using tetoron cotton that can be folded for easy storage. A board equipped with plots containing an icon image of an area in West Sumatra that is at risk of experiencing natural disasters, evacuation routes, gathering points, challenges and assistance. 1 set of help card consists of 22 cards. 20 carts contain the knowledge, and 2 immunity card. For more detail information can be found in the Moroca handbook according to the page numbers listed on the card. A challenge card set consists of 22 cards. As many as 20 cards contain a question, and 2 immunity cards. The correct answer is in the handbook according to the page number listed on the card.

The research team also compiled a manual containing game instructions and answers to the questions listed on the challenge and help cards. The Moroca handbook was prepared by referring to the Guidelines for the Implementation of the Minimum Initial Service Package (MISP) for Reproductive Health in the Health Crisis in 2017. Ideally, this game is played by five people. Four people as active players, and one acts as the field coordinator who oversees the game and holds this manual to see the answers that players get. However,

this game still can be played by 3-6 people.

Expert Validation

The Moroca game and the manual were then validated by two experts, an expert on reproductive health services in disaster situations and an expert on learning media. The media expert is a professor with learning media expertise and has a background of research experience related to disasters. The material expert is a UNFPA Indonesia humanitarian program analyst who is an expert on the minimum initial service package for reproductive health in crisis situations.

The assessment uses a validator assessment sheet which contains a review of the product's conformity with the theory of reproductive health services in disaster situations and the appearance of the design. The assessment points are accuracy, actuality, academic usefulness, and appearance. Feedback and suggestions were obtained from the experts for improvements of the Moroca so that the developed game is feasible to be used as a learning media. The recapitulation of expert validation results is shown in table I.

Table I: Recapitulation of expert validation results

No	Assessment point	Expert of media	Expert of material
1	Accuracy	90%	90%
2	Actuality	80%	100%
3	Usefulness	88%	87,5%
4	Appearance	80%	80%
	Mean	84,5%	89%
	Conclusion	valid	Valid

The results of validation by material expert showed that the indicators are considered to have material aspects are valid. They can be used with minor revisions, with mean score of 89%. The experts provided suggestions for manuals, proofread to re-check typos in several parts, explained in more detail the information on the components of the MISP material, and included the edition of the reproductive health service manual in disaster situations. Based on the assessment of learning media experts, the indicators of the media aspect, with mean score of 84,5%. The expert suggested minor revision. Experts provide suggestions for questions on the Moroca card to be more varied and are developed from the manual as well as the display of colors and images used on the Moroca board. After being revised, the product is sent back to the experts.

Evaluation is the last stage of the Moroca game development step. In the development stage, evaluation was carried out at each stage, and at the end of the stage, an overall evaluation was carried out. This Moroca game had been evaluated by material experts and media experts. The results indicate it is valid and suitable for use. The appearance and ease of use of the application had also been assessed by media experts

and is considered very valid and can be used as one of the media innovations for learning reproductive health services in disaster situations.

Anylysis of Product Trial

The Moroca game was tested on students of the Midwifery Diploma III Study Program in Padang. A total of 22 students became respondents. The trial implementation was carried out on October 14, 2021, after the Level 4 Community Activity Restrictions (Nationalwide Covid 19 Pandemic status) in Padang City ended. During the implementation process, the research team and respondents maintained strict health protocols.

Based on the data from Table II, it is known that the pre value ($p = 0.660$). This means that it is normally distributed. The post value is ($p=0.001$), meaning that the data distribution is not normal. The analysis used is the Wilcoxon test.

Table II: Data Normality Test

No	Variable	n	P*
1	Pre-test	22	0.660
2	Post-test	22	0.001

*) Shapiro-Wilk test

Data in the table III shows that the mean and median values in the post-test scores are higher than those in the pre-test scores. Then, it is known that there is a higher value after students learned using Moroca than before. Based on the Wilcoxon test on the pre-and post-reproductive health learning values in disaster situations using the Moroca game were significantly different ($p<0.001$). The value after the implementation of learning is higher than before learning with Moroca.

This R & D approach has produced a quality health service-learning media, the Moroca Game, in Bahasa Indonesia as Monopoli Pelayanan Kesehatan Reproduksi pada Situasi Bencana (Monopoly of reproductive services in disaster situations). The results of validation by the validator found that the Moroca game was valid and feasible to use. The results on 22 students showed that the post-test mean score was higher than the pre-test mean. The statistical test through Wilcoxon showed a significant difference in the level of knowledge of students about reproductive health services in disaster situations after using the Moroca game.

DISCUSSION

The current study presents a description of "Moroca", a board games as a learning media for reproductive health

service in disaster situation. This Moroca game has been evaluated by material experts and media experts .The results of this study also indicate an increase in the small group of midwifery students' knowledge about reproductive health services in disaster situations after using the Moroca game. The use of games as learning media can be an innovation that increases interest and learning outcomes. The use of game tools enhances the learning experience and activeness of students.

The results of this study are in line with several other studies that have developed monopoly games as learning media. The monopoly games as a learning medium is used to facilitate students' understanding of biology lessons that are considered difficult, such as the topic of the hormone system. The results showed that monopoly modification based on student learning outcomes obtained very good interpretation scores (10). The results of research with the development of monopoly as a learning media show a positive effect in terms of motivation and learning outcomes compared to conventional learning methods without using media (13). A review study showed games provide short-term benefits in health education. Learning game is more interesting than conventional methods (8). Besides increasing knowledge, the learning process also increases students' interest (14). A study showed board games could improve the cognitive function of users (19).

A review showed the positive impact of games in teaching health professions (8). Games can be used to deliver difficult topics easily (20). A study on the use of a modified game in medicine called "AFTERSHOCK" in medical topics during disasters among medical students in Germany also showed positive results. High levels of acceptance and pleasure in learning using this game method. The use of this game is appropriate as an educational medium, which is able to stimulate the complexity of humanitarian assistance in disaster situations (15).

CONCLUSION

This research with an R & D design has produced a learning media for reproductive health services called the Moroca Game (Monopoly on reproductive health services in disaster situations). This Moroca game has been evaluated by material experts and media experts with the results that it is rated in the valid and suitable category for use, and for use, the appearance and ease of use of the application have also been assessed by media experts and are considered very valid and can be used

Table III: Analysis of knowledge of students

Variable	N	Mean	SD	Median	Min-max	P**
Pre-test	22	31.50	8.879	31	16-22	<0.001
Post-test	22	76.0	19.021	82	46-97	

**) Wilcoxon test

as one of the media innovations. learning reproductive health services in disaster situations. This game has also been tested on a small group of 22 midwifery students. The results showed that the post-test mean score was higher than the pre-test mean. Learning media is needed to increase the knowledge and skill of the students. "Moroca" is appropriate as one of the alternative media in education for midwifery students. Furthermore, Moroca can be developed to involve more students and midwives.

ACKNOWLEDGEMENT

Our appreciation goes to the Poltekkes Kemenkes Padang for the grant they awarded us for this research. Our deepest appreciation also goes to our expert validators (Prof. Alwen Bendri and Ms. Elisabeth Adelina Sidabutar).

REFERENCES

- BNPB. UPDATE: Recap on Disaster Data in Indonesia as of January 21, 2020 [Internet]. bnpb.go.id. 2020 [cited 2022 Feb 17]. Available from: <https://bnpb.go.id/berita/update-recap-on-disaster-data-in-indonesia-as-of-january-21-2020>
- Cattleya, L., & Fatimah D. Kerelawanan untuk Kesehatan Reproduksi Masa Paska Bencana [Internet]. Gamalama NTB. 2018 [cited 2022 Feb 18]. Available from: <http://gemaalamntb.org/wp-content/uploads/2018/12/2.-KERELAWANAN-UNTUK-KESEHATAN-REPRODUKSI-MASA-PASKA-BENCANA-ilovepdf-compressed.pdf>
- UNFPA. Inter-Agency Reproductive Health Kits for Crisis Situations. 2008 [cited 2022 Feb 18]; Available from: <https://www.who.int/publications/i/item/inter-agency-reproductive-health-kits-for-crisis-situations>
- Nuruniyah S. Evaluasi Pelayanan Kesehatan Reproduksi Bagi Pengungsi Rawan Bencana Erupsi Merapi. J Ners dan Kebidanan Indones. 2016 Mar 9;2(2):57–61. doi: 10.21927/jnki.2014.2(2).57-61
- Sidabutar EA. Peran Bidan dalam Pelayanan Kesehatan Reproduksi Pada Situasi Bencana [Internet]. [cited 2021 Apr 14]. Available from: [https://www.ibi.or.id/media/Materi Webinar HUT IBI 24 Juni 2020/UNFPA_Peran Bidan dalam Kesehatan Reproduksi Bencana.pdf](https://www.ibi.or.id/media/Materi%20Webinar%20HUT%20IBI%2024%20Juni%202020/UNFPA_Peran%20Bidan%20dalam%20Kesehatan%20Reproduksi%20Bencana.pdf)
- Bharj KK, Luyben A, Avery MD, Johnson PG, O'Connell R, Barger MK, et al. An agenda for midwifery education: Advancing the state of the world's midwifery. Midwifery. 2016 Feb 1;33:3–6. doi: 10.1016/j.midw.2016.01.004
- Ani C. Pengembangan Media dan Sumber Belajar: Teori dan Prosedur [Internet]. Laksita Indonesia; 2019 [cited 2022 Feb 17]. Available from: <https://idr.uin-antasari.ac.id/16140/>
- Haoran G, Bazakidi E, Zary N. Serious Games in Health Professions Education: Review of Trends and Learning Efficacy. Yearb Med Inform [Internet]. 2019 Aug 1 [cited 2022 Feb 18];28(1):240. doi: 10.1055/s-0039-1677904.
- Akl EA, Kairouz VF, Sackett KM, Erdley WS, Mustafa RA, Fiander M, et al. Educational games for health professionals. Cochrane database Syst Rev [Internet]. 2013 Mar 28 [cited 2022 Feb 18];2013(3):CD006411. doi: 10.1002/14651858.CD006411.pub4.
- Herdani TP, Sartono N, Evriyani D. Development of Modified Monopoly Game as a Learning Media On Endocrine System (Research and Development at Senior High School 1 Jakarta). Biosf J Pendidik Biol [Internet]. 2015 Jan 17 [cited 2022 Feb 14];8(1):20–8. doi: 10.21009/biosferjpb.8-1.3
- Ananda R, Adelila Sari S. Pengembangan Media Chemopoly Game Struktur Atom untuk Meningkatkan Aktivitas dan Ketuntasan Belajar Siswa Kelas X di SMA Negeri 4 Banda Aceh. J Ilm Mhs Pendidik Kim [Internet]. 2017 [cited 2021 Apr 14];2(1):73–82. Available from: <http://www.jim.unsyiah.ac.id/pendidikan-kimia/article/view/3405/1706>
- Sari AM, Gunawan I. Developing Physics Monopoly Game Learning Media for Light and Optical Devices. J Ilm Pendidik Fis Al-Biruni [Internet]. 2018 Apr 28 [cited 2022 Feb 17];7(1):71–9. doi: 10.24042/jipfalbiruni.v7i1.2564
- Agustiya F, Sunarso A, Haryani S, Negeri Ketanjung S, Demak K, Tengah J. Influence of CTL Model by Using Monopoly Game Media to The Students Motivation and Science Learning Outcomes. J Prim Educ [Internet]. 2017 Sep 11 [cited 2022 Feb 17];6(2):114–9. doi: 10.15294/JPE.V6i2.17559
- Dinna Hastanti A, Kapten Suparman Nomor J, Magelang Utara K, Magelang K, Tengah J. The Transformation of Monopoly Game: Learning Media to Improve Students' Creativity and Interest in Learning. Int Conf Sci Eng [Internet]. 2020 Apr 30 [cited 2022 Feb 14];3:517–23. doi: 10.14421/icse.v3.555
- Drees S, Geffert K, Brynen R. Crisis on the game board - a novel approach to teach medical students about disaster medicine. GMS J Med Educ [Internet]. 2018 Nov 15 [cited 2022 Feb 22];35(4). doi: 10.3205/zma001192
- Silalahi A. Development Research (Penelitian Pengembangan) dan Research & Development (Penelitian & Pengembangan) Dalam Bidang Pendidikan/Pembelajaran. Res Gate. 2018;(July):1–13. doi: 10.13140/RG.2.2.13429.88803/1
- Gustiani S, Sriwijaya PN. RESEARCH AND DEVELOPMENT (R&D) METHOD AS A MODEL DESIGN IN EDUCATIONAL RESEARCH AND ITS ALTERNATIVES. Holistics (Hospitality Linguist J Ilm Bhs Ingg [Internet]. 2019 Dec 2 [cited 2022 Aug 15];11(2). Available from: <https://jurnal.polsri.ac.id/index.php/holistic/article/view/1849>
- Kemenkes RI. Pedoman pelaksanaan paket

- pelayanan awal Minimum (PPAM) kesehatan reproduksi pada krisis kesehatan [Internet]. Jakarta; 2017 [cited 2021 Apr 14]. Available from: <https://kesga.kemkes.go.id/assets/file/pedoman/PedomanPelaksanaanPPAMKesproPadaKrisisKesehatan.pdf>
19. Ching-Teng Y. Effect of board game activities on cognitive function improvement among older adults in adult day care centers. <https://doi.org/10.1080/0098138920191656143> [Internet]. 2019 Oct 21 [cited 2022 Feb 22];58(9):825–38. doi: 10.1080/00981389.2019.1656143
20. Brar G, Lambert S, Huang S, Dang R, Chan TM. Using Observation to Determine Teachable Moments Within a Serious Game: A GridlockED as Medical Education (GAME) Study. *AEM Educ Train* [Internet]. 2020 Apr 1 [cited 2022 Feb 22];5(2). doi: 10.1002/aet2.10456