How to Cite
Wulansari, M., Sinrang, A. W., Syarif, S., Ahmad, M., Bahar, B., & Maddepungeng, M. (2021). The effectiveness of android-based education media of growth and development care towards mother's knowledge improvement. *International Journal of Health & Medical Sciences*, *4*(2), 238-245.
https://doi.org/10.31295/ijhms.v4n2.1715

The Effectiveness of Android-Based Education Media of Growth and Development Care towards Mother's Knowledge Improvement

Meinita Wulansari
Midwifery Study Program, Graduate School, Hasanuddin University, Indonesia
Corresponding author email: wulansarim18p@student.unhas.ac.id

Andi Wardihan Sinrang
Department of Physiology, Faculty of Medicine, Hasanuddin University, Indonesia
Email: wardihans@gmail.com

Syafruddin Syarif
Department of Electrical Engineering, Faculty of Engineering, University, Indonesia
Email: syaffruddin.s@eng.unhas.ac.id

Mardiana Ahmad
Midwifery Study Program, Graduate School of Hasanuddin University, Indonesia
Email: mardianaa908@gmail.com

Burhanuddin Bahar
Department of Public Health, Graduate School of Hasanuddin University, Indonesia
Email: burhanddin_bahar@yahoo.com

Martira Maddepungeng
Pediatrics, Faculty of Medicine, Hasanuddin University, Indonesia
Email: martira711@yahoo.com

Abstract*---*A Finnish study aimed to see the effect of using android-based educational media for child development care (Pekka Madising) on increasing mother's knowledge. The study is a quasi-experimental study with one control group and one control pretest-posttest group. Each group was given educational media in the form of Pekka madising application in the intervention group and Printed Out in the cant print drop for a week. The results showed that there were differences in the level of knowledge of respondents before being given the intervention, namely (p-Value = 0.736) at and after being given it.
Keywords*---*child development care, educational media, android, improvement, growth

Introduction

One of the factors that need to be considered to optimize the growth and development of toddlers is by paying attention to their growth and development care. Growth and development care is a series of activities that aim to improve the health status of toddlers, both physically, cognitively, and psychologically by monitoring growth and development and screening for growth and development disorders (Menkes, 2014). Optimal growth and development can produce quality toddlers, which will positively impact national development in the future (Kadi et al., 2008; Susanty et al., 2014).

ISSN 2632-9433
Submitted: 18 June 2021 |Revised: 27 July 2021 | Accepted: 03 August 2021

The growth and development of toddlers will be disrupted if they are given inappropriate care. These growth and development disorders are *underweight, stunting,* and *wasting* (Ministry of Health of the Republic of Indonesia). This disorder will indirectly impact infant morbidity and mortality (Fink and Rockers, 2014; Julia et al., 2008; Titaley et al., 2019). The impact of further growth and development disorders is a decrease in academic achievement, poor cognitive abilities, and produce complete human resources, which impacts future socio-economic decline (Black et al., 2016; Titaley et al., 2019). Therefore, special attention is needed in providing care such as meeting physical and biological needs, adequate nutrition, psychological needs, stimulation needs, and a clean and safe environment (Hendrawati et al., 2018; Rothman et al., 2018; Usman & Sukandar, 2014).

One of the components of a mother's readiness to provide care for her toddler's growth and development is knowledge. Knowledge plays a role in the ability of families to monitor and screen growth and development and stimulate the development of toddlers accordingly. In addition, it can also increase mothers' awareness in providing care for the growth and development of their children (Wijayanti & Purwandari, 2006). Lack of knowledge results from the less-than-optimal use of existing educational media, low interest in reading, and lack of awareness of mothers in seeking information about child development care (Indrayani et al., 2019; Perdana et al., 2017).

One way to increase maternal knowledge is by using appropriate health education media. Health education media itself is a means used by communicators to ensure that the health information conveyed can be well received by the communicant (Notoatmodjo, 2012). Previous research has shown that the use of *booklet* educational media has proven to increase the nutritional knowledge of elementary school children (Pramuditya et al., 2018; Zulaekah, 2012). With current technological advances, the use *of Android smartphones* is maximized. In addition to being fast and easy to use, *Android smartphones* also provide up-to-date and varied information. This causes the use *of Android smartphones* as a means of communication and as an educational medium. This is evidenced by previous research, which revealed that smartphones as an educational medium was proven to be effective in improving public health status (Ekadinata & Widyandana, 2017; Laranjo et al., 2015). The magnitude of the benefits and interest in using *an Android smartphone* can be used as an opportunity to create an educational media for child development care based on *Android* that is attractive and easy to use to increase mother's knowledge and awareness in providing child development care (Holt & Mikati, 2011; Herbst & Tekin, 2010).

Materials and Methods

Research location and design

This research was conducted in the working area of Pangolombian Health Center, Tomohon City, North Sulawesi Province. This study uses a *quasi-experimental design* with a *one-group control pretest and posttest* model (Sylve et al., 2012; Small et al., 1995; Van den Berg et al., 1982).

Population and sample

The population in this study were all mothers of children under five who were in the working area of the Pangolombian Health Center, Tomohon City, as many as 409 people. Sampling using *purposive sampling technique* and the Slovin formula in determining the number of samples, as many as 88 respondents who have met the inclusion criteria, namely mothers who have toddlers in the work area of Pangolombian Health Center, To Please, mothers who have and are proficient in using *android smartphones*, mothers who can read and write, and are willing to be respondents and are willing to sign the informed consent that has been issued by the Ethics Committee of the Faculty of Medicine, Hasanuddin University. Respondents were then divided into two groups, namely the experimental group and the control group (Walker et al., 2011; Sangsawang, 2015).

Method of collecting data

Data collection is done by using a questionnaire. At the initial stage, a *pretest was* carried out in both groups to measure the respondents' level of knowledge about the care for growth and development of toddlers before being given intervention in both groups. Then the intervention was given to each group, namely *Pekka Madising* in the experimental group and *Leaflets* in the control group for one week. Then, a *posttest* or measurement of the respondent's level of knowledge was carried out in the second stage to assess the respondents' level of knowledge after the intervention was given to each group. This questionnaire contains multiple-choice questions as answers (Hobbs et al., 2019; Hazaea et al., 2014).

Data analysis

Data analysis used a computer with SPSS program where the univariate test was carried out with *Chi-Square,* and the bivariate test was carried out with *Mann-Whitney* and *Wilcoxon Signed Ranked*.

Research Result

Univariate analysis

Characteristics of research respondents include age, education, occupation, and growth status of children under five, as shown in table 1.

Table 1
Characteristics of respondents at Pangolombian health centre Tomohon city (n=88)

Variable	Pekka Madising Application n(%)	*Leaflet* n(%)	*P-Value*
Age			
< 25 years old	8 (18.2)	8 (18.2)	0.006
25 – 35 years	25 (56.8)	20 (45.5)	
>35 years old	11 (25,0)	16 (36.3)	
Education			
junior high school	10 (22.8)	23 (52,3)	0.095
senior High School	17 (38.6)	11 (25,0)	
Bachelor	17 (38.6)	10 (22.7)	
Profession			
Work	14 (31.8)	12 (27.3)	0.002
Does not work	30 (68.2)	32 (72.7)	
Toddler Health Status			
Normal	31 (70.5)	33 (75.0)	0.000
Disturbance	13 (29.5)	11 (25,0)	

**Chi-Square, p=sig<0.05*

Table 1. Shows that most of the respondents in this study were aged 25 to 35 years, which can be seen from the *Pekka Madising* application group (56.8%) and the *Leaflet* group as a control (45.5%). Most of the educational background of the respondents in this study, namely, the *Pekka Madising* application group was SMA and undergraduate each (38.6%), while the *Leaflet* group was SMP (52.3%). The occupational background of the respondents in this study was primarily unemployed or Housewives (IRT), namely (68.2%) in the *Pekka Madising* application group and 72.7% in the *Leaflet* group. The health status of children under five in this study was primarily normal, with the percentage of each group (70.5%) in the *Pekka Madising* application group and (75.0%) in the *Leaflet* group (Vidas et al., 2011; Talha et al., 2015).

Bivariate analysis

The Effect of the Use of Educational Media on Mother's Knowledge about Child Development Care in the Experimental Group and Control Group

Table 2
Knowledge level of respondents before and after experiments were conducted in each group

Variable	Pekka Madising Application			*Leaflet*			*p-Value*
	Well	Enough	Not enough	Well	Enough	Not enough	
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Pre-test							
Definition of Growth	14 (31.8)	24 (54.6)	6 (13,6)	15 (34.1)	22 (50.0)	7 (15.9)	
Nutritional needs	0 (0)	13 (29.5)	31 (70.5)	10 (22.7)	6 (13,6)	28 (63.7)	0.736
Care for BBL and Toddlers	3 (6.8)	18 (40.9)	23 (52,3)	2 (4,6)	24 (54.5)	18 (40.9)	
Care for Sick Toddlers	8 (18.2)	23 (52,3)	13 (29.5)	5 (11,4)	6 (13,6)	33 (75)	
Post-Test							
Definition of Growth	30 (68.2)	13 (29.5)	1 (2,3)	16 (36.4)	20 (45.4)	8 (18.2)	
Nutritional needs	27 (61.4)	13 (29.5)	4 (9,1)	14 (31.8)	9 (20,5)	21 (47.7)	<0.001
Care for BBL and Toddlers	16 (36.4)	24 (54.5)	4 (9,1)	3 (6.8)	16 (36.4)	25 (56.8)	
Care for Sick Toddlers	17 (38.6)	20 (45.5)	7 (15.9)	9 (20,5)	15 (34.1)	20 (45.4)	

**Mann-Whitney Test*

Table 2 shows that the analysis of the level of knowledge before the intervention was given to both groups (*p-Value* = 0.736). This shows that there is no difference in the level of knowledge in the two groups. Meanwhile, the results of the *posttest* analysis of the level of knowledge in the *Pekka Madising* application group and the *Leaflet* group were (p-*Value* < 0.001). This indicates that after being given different interventions in each group, there is a significant difference in respondents' knowledge about child development care. This difference can be seen in the question points regarding care for Newborns (BBL) and toddlers, which in the *leaflet* group did not increase but decreased, as shown in table 2. When the *pretest was* conducted, respondents with less knowledge were 40.9%, respondents with sufficient knowledge 54.5%, and respondents with good knowledge 4.6%. After doing the *posttest*, respondents with less knowledge increased to 56.8%, respondents who had sufficient and good knowledge decreased to 36.4% and 6.8%, respectively. Meanwhile, in the *Madison Pekka* group, the respondents who had less knowledge before the intervention were 52.3%, 40.9% sufficient, and 6.8% good. Then after the intervention, respondents with less knowledge decreased to 4.1%, those with sufficient and good knowledge increased to 54.5% and 36.4%, respectively. The Effect of the Use of Educational Media on Mother's Knowledge about Child Development Care in the Experimental Group and Control Group.

Table 3
The effect of the use of educational media on the knowledge level of mothers toddlers about child development care

Variable	Group	*mean*	*p-Value*	N
Pekka Madising Application	*Pre-test*	50.55	<0.001	44
	Post-Test	75.55		
	Difference	25.00		
Leaflet	*Pre-test*	50.59	0.017	44
	Post-Test	55.64		
	Difference	5.05		

**Wilcoxon Signed Rank*

Table 3 shows that in the group that was given the intervention in the *Pekka Madising* application, there was an increase in the percentage before and after the intervention by 25% with a value (*p-Value* <0.001). While in the *leaflet* group, the increase was only 5.05% with a value (*p-Value* =0.017). This shows the effect of educational media, both given the intervention in the *Pekka Madising* application and the *Leaflet* group. The Effectiveness of Using Educational Media for Pekka Madising Applications and *Leaflet* Media in Both Groups.

Table 4
The effectiveness of using educational media for pekka madising applications and *leaflet* media in the control group and the intervention group

Group	Negative Rank	Positive Rank	Ties	p-Value
Pekka Madising Application	3	39	2	<0.001
Leaflet	11	27	6	0.017

**Wilcoxon Signed Rank*

Table 4 shows that in the *Pekka Madising* application group, respondents experienced an increase in knowledge of 39 respondents (*p-Value* < 0.001). Meanwhile, in the *Leaflet* group, only 27 respondents experienced increased knowledge (*p-Value* = 0.017). This shows that using the *Pekka Madising* Application increases respondents' knowledge more effectively than the *Leaflet* method.

Discussion

Respondent's level of knowledge about toddler development

The results showed that the mother's knowledge about child development care before the intervention was carried out in the two groups was still lacking. This can be seen in Table 2.4, which *shows* that most of the respondents in the *Pekka Madising* Application group and the *Leaflet* group have less knowledge, both in terms of questions on the definition of growth, nutritional needs, and care for infants and toddlers, as well as questions regarding care for sick toddlers. Knowledge is needed in optimizing the growth of toddlers. Knowledge plays a role in providing appropriate toddler care so that toddlers can grow and develop optimally without any problems (Amirah & Rifqi, 2019).

Following Sari & Ratnawati (2018), research, it shows that mothers who have insufficient knowledge tend to have toddlers with poor nutritional status, namely (84.2%). This study is inversely proportional to the results of Amirah & Rifqi (2019), research in 2019 that there was no relationship between mother's knowledge and the nutritional status of toddlers with a value (*p-Value* = 0.593). This study reveals an edge needed in providing care to their toddlers and others, such as attitudes and self-confidence. After being given the intervention, there was a significant difference in the level of knowledge of child development care in each group, which can be seen from the results of data analysis of (p<0.001). This difference can be seen in table 2; before the intervention, most respondents had less knowledge about child development care. After the intervention, the knowledge about child development care in the *Madison Pekka* group increased to good for most respondents. While in the *Leaflet* group, most of the respondents' knowledge turned out to be sufficient (Sari et al., 2021; Halapiry et al., 2020).

Increased knowledge occurs due to the process of receiving information through infographics. Infographics present information visually in the form of text combined with images that the brain can directly process so that respondents are faster in absorbing the information conveyed (Zaki & Sari, 2019). In line with Zaki and Sari, (2019), there was an increase in knowledge after being given intervention in social media-based nutrition education media in rural and urban areas.

The influence and effectiveness of using android-based educational media and leaflets on mother toddler knowledge

Educational media is a means to convey messages or information to those intended by communicators, using print or electronic media (Notoatmodjo, 2012). Educational media must be designed according to user needs and packaged attractively to be used effectively to increase the knowledge and attitudes of mothers of toddlers in providing growth and development care for their toddlers (Ahmadi et al., 2017; Styaningrum & Metty, 2021). *Android*-based educational media such as the *Pekka Madising* application are designed to encourage reading interest and mother's

willingness to learn about child development care independently to increase mother's knowledge about child development care.

The results of data analysis showed that the knowledge of respondents who were given intervention in the form of *Pekka Masiding* applications and those who were given intervention in the form of *Leaflets* had increased. Table 4.3 shows that respondents' knowledge before being given intervention in the *Madison Pekka* group was (50.55%), which later increased to (75.55%). In the group that was given the intervention in the form of *leaflets*, the knowledge before being given the intervention was (50.59%) and increased to (55.64%). This shows that the increase in knowledge was more significant in the group given the intervention in the *Pekka Madising* application, which was 25%. This increase also shows that the health education media provided affects mother's knowledge about child development care.

Knowledge results from obtaining information on an object that involves sensing was essential (Dahlan et al., 2013). Knowledge is critical in forming a mother's attitude to provide appropriate growth and development care for toddlers. This is because knowledge can form a person's belief in behavior and action that is obtained through health education (Silalahi et al., 2018). Following Sari and Ratnawati's research results in 2018, mothers with less knowledge about toddler feeding patterns tend to have toddlers with poor nutritional status with a *p-value* = 0.01 (Sari & Ratnawati, 2018). The results of data analysis showed that in the group that was given the intervention in the form of the *Pekka Madising* application, many respondents experienced an increase in knowledge, which can be seen in table 4. While in the *Leaflet* group, the number of respondents who experienced a decrease in knowledge and had permanent knowledge slightly differed from the respondents. Who has increased knowledge?

The difference in knowledge is due to the different types of educational media used in the two groups. Educational media that use technology tend to be more attractive than printed educational media. This study is in line with research conducted by Meridiana et al. in 2018 that the increase in respondents' knowledge was more significant in respondents who were given intervention in the form of videos than respondents who were given intervention in the form of *leaflets* with *p-Value* values, respectively ($p < 0.001$) and ($p < 0.001$) and ($p < 0.001$) and ($p < 0.001$). $p = 0.003$) (Meidiana et al., 2018). This is because audio-vidual media can streamline the learning process quickly, and the material received will last longer and stay in memory, and reduce the occurrence of misunderstandings by users.

Android-based educational media is currently more in demand by the public. Educational media for *Pekka Madising* contains growth and development care materials according to user needs packaged attractively to attract respondents' interest in reading. The *Pekka Madising* application is equipped with a feature to *collect* respondents' knowledge about child development care so that self-study evaluation using the *Pekka Madising* application is more practical and accessible. Another feature that is no less interesting is measuring the growth status of toddlers so that respondents can more easily monitor their child's growth. The *Pekka Madising* application can be an alternative educational media that effectively increases knowledge about child growth and development care, hoping to change respondents' thinking patterns and behavior in caring for their toddlers to grow and develop optimally.

Conclusion

Based on the results of the research that has been done, it can be concluded that:

- There is a significant effect on respondents' level of knowledge after being given the intervention, both in the group given the intervention in *Pekka Madison* and the group given the intervention in the form of *Leaflets.*
- There is a difference in the increase in knowledge in the two groups. The *Pekka Madising* group was more effective in increasing respondents' knowledge than the *Leaflet* group. It can be seen from the difference in knowledge before and after the intervention was given to each group, namely 25% in the *Masiding Pekka* group, while in the *Leaflet* group, it was only 5.05%.

Acknowledgments

The researcher would like to thank the Pangolombian Health Center staff, all respondents, programmers, and supervisors who have assisted in the research process in the form of providing advice and encouragement both morally and materially.

References

Ahmadi, F., Sutaryono, S., Witanto, Y., & Ratnaningrum, I. (2017). Pengembangan media edukasi "Multimedia Indonesian Culture"(MIC) sebagai penguatan pendidikan karakter siswa Sekolah Dasar. *Jurnal Penelitian Pendidikan, 34*(2), 127-136.

Amirah, A. N., & Rifqi, M. A. (2019). Karakteristik, Pengetahuan Gizi Ibu dan Status Gizi Balita (BB/TB) Usia 6-59 bulan. *Amerta Nutrition, 3*(3), 189-193.

Black, M. M., Fernandez-Rao, S., Hurley, K. M., Tilton, N., Balakrishna, N., Harding, K. B., ... & Nair, K. M. (2016). Growth and development among infants and preschoolers in rural India: Economic inequities and caregiver protective/promotive factors. *International Journal of Behavioral Development*, *40*(6), 526-535.

Dahlan, R., Midin, M., Sidi, H., & Maniam, T. (2013). Hospital-based community psychiatric service for patients with schizophrenia in K uala L umpur: A 1-year follow-up study of re-hospitalization. *Asia-Pacific Psychiatry*, *5*, 127-133.

Ekadinata, N., Widyandana, D., & Widyandana, D. (2017). Promosi kesehatan menggunakan gambar dan teks dalam aplikasi WhatsApp pada kader posbindu. *Berita Kedokteran Masyarakat*, *33*(11), 547.

Fink, G., & Rockers, P. C. (2014). Childhood growth, schooling, and cognitive development: further evidence from the Young Lives study. *The American journal of clinical nutrition*, *100*(1), 182-188.

Halapiry, J., Ramadany, S., Sanusi B, Y., Made, S., Stang, S., & Syarif, S. (2020). Children's midwifery learning media application about early detection of android-based growth in improving midwifery students skills. *International Journal of Health & Medical Sciences*, *3*(1), 153-159.

Hazaea, A., Ibrahim, N., & Nor, N. F. M. (2014). Dissemination of Human Values: Discourse Analysis of Global Educational Media Texts. *Procedia-Social and Behavioral Sciences*, *118*, 166-171. https://doi.org/10.1016/j.sbspro.2014.02.022

Hendrawati, S., Mardhiyah, A., Mediani, H. S., Nurhidayah, I., Mardiah, W., Adistie, F., & Maryam, N. N. A. (2018). Pemberdayaan Kader Posyandu dalam Stimulasi Deteksi dan Intervensi Dini Tumbuh Kembang (SDIDTK) pada Anak Usia 0–6 Tahun di Desa Cileles Kecamatan Jatinangor Kabupaten Sumedang. *Media Karya Kesehatan*, *1*(1).

Herbst, C. M., & Tekin, E. (2010). Child care subsidies and child development. *Economics of Education review*, *29*(4), 618-638. https://doi.org/10.1016/j.econedurev.2010.01.002

Hobbs, E. C., Trevisan, C., Johansen, M. V., Dorny, P., & Gabriël, S. (2019). Value of electronic educational media in combatting parasitic diseases. *Trends in parasitology*, *35*(3), 173-176. https://doi.org/10.1016/j.pt.2018.10.001

Holt, R. L., & Mikati, M. A. (2011). Care for child development: basic science rationale and effects of interventions. *Pediatric neurology*, *44*(4), 239-253. https://doi.org/10.1016/j.pediatrneurol.2010.11.009

Hussain, M., Zaidan, A. A., Zidan, B. B., Iqbal, S., Ahmed, M. M., Albahri, O. S., & Albahri, A. S. (2018). Conceptual framework for the security of mobile health applications on android platform. *Telematics and Informatics*, *35*(5), 1335-1354. https://doi.org/10.1016/j.tele.2018.03.005 Cullen, D. J., Bates, D. W., Small, S. D., Cooper, J. B., Nemeskal, A. R., & Leape, L. L. (1995). The incident reporting system does not detect adverse drug events: a problem for quality improvement. *The Joint Commission journal on quality improvement*, *21*(10), 541-548. https://doi.org/10.1016/S1070-3241(16)30180-8

Indrayani, D., Legiati, T., & Hidayanti, D. (2019). Kelas Ibu Balita Meningkatkan Pengetahuan dan Keterampilan Ibu dalam Stimulasi Tumbuh Kembang. *Jurnal Kesehatan Prima*, *13*(2), 115-121.

Julia, M., van Weissenbruch, M. M., Delemarre-van de Waal, H. A., & Surjono, A. (2008). Influence of socioeconomic status on the association between low weight at birth and stunted growth or overweight in rural and urban Indonesian prepubertal children. *Paediatrica Indonesiana*, *48*(4), 214-9.

Kadi, F. A., Garna, H., & Fadlyana, E. (2016). Kesetaraan hasil skrining risiko penyimpangan perkembangan menurut cara kuesioner praskrining perkembangan (KPSP) dan denver II pada anak usia 12-14 bulan dengan berat lahir rendah. *Sari Pediatri*, *10*(1), 29-33.

Laranjo, L., Arguel, A., Neves, A. L., Gallagher, A. M., Kaplan, R., Mortimer, N., ... & Lau, A. Y. (2015). The influence of social networking sites on health behavior change: a systematic review and meta-analysis. *Journal of the American Medical Informatics Association*, *22*(1), 243-256.

Meidiana, R., Simbolon, D., & Wahyudi, A. (2018). Pengaruh Edukasi melalui media audio visual terhadap pengetahuan dan sikap remaja overweight. *Jurnal Kesehatan*, *9*(3), 478-484.

Menkes, R. I. (2014). Peraturan Menteri Kesehatan Republik Indonesia Nomor 75 Tahun 2014 Tentang Pusat Kesehatan Masyarakat. *Departeman Kesehatan Republik IndonesiaI*, *3*(11).

Notoatmodjo, S. (2012). Metodologi penelitian kesehatan.

Notoatmodjo, S. (2012). Promosi kesehatan dan perilaku kesehatan.

Perdana, F., Madanijah, S., & Ekayanti, I. (2017). Pengembangan media edukasi gizi berbasis android dan website serta pengaruhnya terhadap perilaku tentang gizi seimbang siswa sekolah dasar. *Jurnal Gizi dan Pangan*, *12*(3), 169-178.

Pramuditya, S. A., Noto, M. S., & Purwono, H. (2018). Desain Game Edukasi Berbasis Android pada Materi Logika Matematika. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *2*(2), 165-179.

RI, K. (2010). *Keputusan Menteri Kesehatan republik Inodnesia Nomor 1995/Menkes*. SK/XII/2010. Standar Antropometri Penilaian status Gizi. Kementerian Kesehatan RI.
Rothman, M., Faber, M., Covic, N., Matsungo, T. M., Cockeran, M., Kvalsvig, J. D., & Smuts, C. M. (2018). Infant development at the age of 6 months in relation to feeding practices, Iron status, and growth in a peri-urban community of South Africa. *Nutrients*, *10*(1), 73.
Sangsawang, T. (2015). Instructional design framework for educational media. *Procedia-Social and Behavioral Sciences*, *176*, 65-80. https://doi.org/10.1016/j.sbspro.2015.01.445
Sari, M. R. N., & Ratnawati, L. Y. (2018). Hubungan Pengetahuan Ibu tentang Pola Pemberian Makan dengan Status Gizi Balita di Wilayah Kerja Puskesmas Gapura Kabupaten Sumenep. *Amerta Nutrition*, *2*(2), 182-188.
Sari, R. I., Syarif, S., Arsyad, M. A., Usman, A. N., & Ramadany, S. (2021). Android-based application of women's reproductive health to parent knowledge as a learning media. *International Journal of Health & Medical Sciences*, *4*(2), 196-201.
Silalahi, V., Lismidiati, W., Hakimi, M., Keperawatan, B. I., Kedokteran, F., & Mada, U. G. (2018). Efektivitas Audiovisual dan Booklet sebagai Media Edukasi untuk Meningkatkan Perilaku Skrining IVA Effectiveness of audiovisual and booklet as Education Media to. *J Media Kesehat Masy Indones*, *14*(3), 304-15.
Styaningrum, S. D., & Metty, M. (2021). Games Kartu Milenial Sehat sebagai media edukasi pencegahan anemia pada remaja putri di sekolah berbasis asrama Healthy Millennial Card games as an anemia prevention education media among female adolescent at boarding school.
Susanty, A., Fadlyana, E., & Nataprawira, H. M. (2014). Manfaat intervensi dini anak usia 6–12 bulan dengan kecurigaan penyimpangan perkembangan. *Majalah Kedokteran Bandung*, *46*(2), 63-67.
Sylve, J., Case, A., Marziale, L., & Richard, G. G. (2012). Acquisition and analysis of volatile memory from android devices. *Digital Investigation*, *8*(3-4), 175-184. https://doi.org/10.1016/j.diin.2011.10.003
Talha, K. A., Alper, D. I., & Aydin, C. (2015). APK Auditor: Permission-based Android malware detection system. *Digital Investigation*, *13*, 1-14. https://doi.org/10.1016/j.diin.2015.01.001
Titaley, C. R., Ariawan, I., Hapsari, D., Muasyaroh, A., & Dibley, M. J. (2019). Determinants of the stunting of children under two years old in Indonesia: a multilevel analysis of the 2013 Indonesia basic health survey. *Nutrients*, *11*(5), 1106.
Usman, H., & Sukandar, H. (2014). Pertumbuhan dan Perkembangan Anak Usia 3-24 Bulan di Daerah Konflik. *Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, *9*(1), 44-49.
Van den Berg, L., Drewett, R., Klaassen, L. H., Rossi, A., & VIjVERBERG, C. H. (1982). *A study of growth and decline* (Vol. 1). Oxford: Pergamon Press. https://doi.org/10.1016/C2013-0-03056-3
Vidas, T., Zhang, C., & Christin, N. (2011). Toward a general collection methodology for Android devices. *digital investigation*, *8*, S14-S24. https://doi.org/10.1016/j.diin.2011.05.003
Walker, S. P., Wachs, T. D., Grantham-McGregor, S., Black, M. M., Nelson, C. A., Huffman, S. L., ... & Richter, L. (2011). Inequality in early childhood: risk and protective factors for early child development. *The lancet*, *378*(9799), 1325-1338. https://doi.org/10.1016/S0140-6736(11)60555-2
Wijayanti, R., & Purwandari, H. (2006). Dampak Penggunaan Modul terhadap Peningkatan Pengetahuan dan Ketrampilan Keluarga dalam Mestimulasi Tumbuh Kembang Bayi. *Jurnal Keperawatan Soedirman*, *1*(2), 83-90.
Zaki, I., & Sari, H. P. (2019). Edukasi gizi berbasis media sosial meningkatkan pengetahuan dan asupan energi-protein remaja putri dengan kurang energi kronik (KEK). *Gizi Indonesia*, *42*(2), 111-122.
Zulaekah, S. (2012). Pendidikan gizi dengan media booklet terhadap pengetahuan gizi. *KEMAS: Jurnal Kesehatan Masyarakat*, *7*(2), 127-133.