

Penyuluhan Gizi Seimbang sebagai Upaya Peningkatan Pengetahuan Ibu untuk Mencegah Gizi Buruk (Studi Kasus di Desa Mojo, Kecamatan Kalitidu, Kabupaten Bojonegoro)

Counseling of Balanced Nutrition as an Effort to Increase Mother's Knowledge on Preventing Malnutrition (Case Study in Mojo Village, Kalitidu District, Bojonegoro Regency)

Christin Panjaitan^{1*}, Erni Astutik¹

ABSTRAK

Latar Belakang: Gizi buruk merupakan masalah gizi pada balita yang masih terjadi hingga saat ini, termasuk di Indonesia. Jawa Timur merupakan salah satu provinsi yang menyumbang cukup banyak balita gizi buruk. Kekurangan gizi jangka panjang akan berdampak pada kualitas sumber daya manusia.

Tujuan: Menganalisis hubungan antara pemberian konseling gizi seimbang dengan peningkatan pengetahuan ibu dalam pencegahan gizi buruk.

Metode: Metode yang digunakan dalam penelitian ini adalah *Quasi Experiment* dengan desain *one group pre-test and post-test*. Teknik pengambilan sampel adalah metode *total sampling*, sampelnya adalah seluruh ibu yang memiliki balita di Desa Mojo Kecamatan Kalitidu Kabupaten Bojonegoro sebanyak 42 orang. Desa Mojo dipilih secara purposive. *Dependent T-test* digunakan untuk mengukur perbedaan tingkat pengetahuan ibu sebelum dan sesudah diberikan pendidikan. Tingkat respon penelitian ini adalah 71,4%.

Hasil: Hasil penelitian menunjukkan bahwa pada awal sesi sebelum penyuluhan diberikan pengetahuan ibu 50% baik, pengetahuan cukup 40%, dan pengetahuan kurang 10%. Setelah dilakukan penyuluhan 60% ibu memiliki pengetahuan baik dan pengetahuan cukup 40%. Rerata skor sebelum konseling adalah $67,33 \pm 15,30$ dan setelah konseling berubah menjadi $72,00 \pm 9,90$ ($P < 0,05$).

Kesimpulan: Pemberian penyuluhan gizi seimbang di Desa Mojo berhubungan signifikan dengan peningkatan pengetahuan ibu untuk mencegah gizi buruk. Ahli Gizi di Puskesmas dan kader Posyandu memiliki peran penting dalam memberikan pendidikan gizi kepada ibu untuk mencegah gizi buruk.

Kata kunci: gizi seimbang, penyuluhan, pengetahuan, gizi buruk

ABSTRACT

Background: Malnutrition is a nutritional problem in children under five that still occurs today, including in Indonesia. East Java is one of the province that contributes quite a lot of malnourished children under five. Long-term malnutrition will impact the quality of human resources.

Objective: To analyze the relationship between providing balanced nutrition counseling with the increase of mother's knowledge to prevent malnutrition.

Methods: The method used in this study is *Quasi Experiment* with *one group pre-test and post-test* design. The sampling technique is the *total sampling* method, the sample are all mothers who have children under five in Mojo Village, Kalitidu District, Bojonegoro Regency as many as 42 people. Mojo Village was selected purposively. The *dependent T-test* was used to measure the differences of the mother's knowledge level before and after the education being given. The response rate of this study is 71.4%.

Results: The results showed that at the beginning of the session before the counseling being given, 50% of mothers had good knowledge, sufficient knowledge 40%, and lacked knowledge 10%. After the counseling was carried out, 60% of mothers had good knowledge and sufficient knowledge 40%. The mean score before counseling was 67.33 ± 15.30 and after counseling, it changed to 72.00 ± 9.90 ($P < 0.05$).

Conclusion: *The provision of balanced nutrition counseling in Mojo Village is significantly associated with the increase of mother's knowledge to prevent malnutrition. The Nutritionist in Puskesmas and Posyandu cadres have an important role in providing nutrition education to mothers to prevent malnutrition.*

Keywords: *balanced nutrition, counseling, knowledge, malnutrition*

*Koresponden:

Christin.panjaitan-2017@fkm.unair.ac.id

Christin Panjaitan

¹Departemen Epidemiologi, Biostatistika dan Kependudukan, dan Promosi Kesehatan dan Ilmu Perilaku, Fakultas Kesehatan Masyarakat, Universitas Airlangga, Kampus C Mulyorejo, 60115, Surabaya, Jawa Timur, Indonesia

INTRODUCTION

Malnutrition is a nutritional problem in children under five that still occurs today. Based on the results of RISKESDAS 2018, the prevalence of malnutrition in Indonesia reached 3.9% and East Java is one of the provinces that contributes quite a lot of malnourished children under five with a prevalence of 3.3% (Kementerian Kesehatan RI, 2018). In 2018, the case of malnutrition among children under five who received treatment in Bojonegoro Regency was 0.71% (Dinas Kesehatan Provinsi Jawa Timur, 2018).

Mojo Village is one of the villages located in Kalitidu District, Bojonegoro Regency. Based on the results of the researcher's preliminary study, it was found that some children under five in Mojo Village still experience nutritional problems. As much as 14.7% of the total number of children under five in Mojo Village experience nutritional problems. Based on the total of children under five who experience nutritional problems, 7.35% of children under five in Mojo Village are moderate thinness, 1.47% of children under five are obese, 1.47% of children under five are short and 4.41% of children under five are mild thinness (Qolby, Christin, et al., 2019).

Malnutrition not only increases morbidity and mortality but also decreases productivity, inhibits the growth of brain cells resulting in ignorance and underdevelopment (Krisnansari, 2010). There are several deadly diseases of children under five when their nutritional intake is lacking, including respiratory diseases (pneumonia), diarrhea, and measles (Rahmawati, Ira, 2007). It shows that malnutrition is a health problem that must be addressed as early as possible so that it does not have a worse impact.

Knowledge is an important factor in fulfilling children under five nutritional statuses. According to Rini (2016), one of the causes of malnutrition in children under five is poor knowledge of nutrition and health in parents. Several things have a strong role in determining the nutritional status of children, including the mother's knowledge regarding nutritional needs, as well as methods and schedules for feeding children (Syafiriani, 2016). The level of education is one of the main determinants of the stunting problem (Rachmah, 2020). Good knowledge can lead to good behavior in parenting, including the fulfillment of children under five nutrition. The understanding of parents, which is mothers have a significant influence on parenting styles and nutritional status of children (Kementerian Kesehatan RI, 2018)

One of the primary prevention that can be done in preventing malnutrition among children under five is through health promotion. The form of health promotion that can be done is through balanced nutrition counseling. Counseling is the activity of conveying or explaining messages that contain information, ideas, emotions, skills from an institution, group, and other individuals (Communicants) to change knowledge and awareness (Fatmawati, 2014). Nutrition education to the community has become the main policy for nutrition improvement efforts in the Rencana Pembangunan Lima Tahun (Repelita) VI. According to the Ministry of National Development Planning, the Republic of Indonesia, efforts to prevent and overcome nutritional problems, including malnutrition, are the main attention is given in community education (Badan Perencanaan Pembangunan Nasional, 2011).

The purpose of this study is to analyze the relationship between providing balanced nutrition counseling with the increase of mother's knowledge to prevent malnutrition in Mojo Village, Kalitidu District, Bojonegoro Regency, East Java Province. This research can be used as a basis for providing education to mothers of children under five in Mojo Village if it is proved that it can increase mother's knowledge regarding balanced nutrition.

METHOD

This research uses Quasi Experiment with pre-test and post-test design. The sampling technique is the total sampling method, all mothers who have children under five in Mojo Village, Kalitidu District, Bojonegoro

Regency as many as 42 people with a research response rate of 71.4%. The inclusion criteria of this study were mothers of children under five who were willing to be respondents and domiciled in the Mojo Village. Meanwhile, the exclusion criteria was mothers of children under five who were not willing to attend counseling events until the end of the event. The research was conducted at Mojo Village Meeting Hall, Kalitidu District, Bojonegoro Regency, East Java. The research location was selected purposively and was carried out in January 2020.

Health education was carried out by researchers. During outreach activities, mothers of children under five were given leaflets containing the materials, such as definition of balanced nutrition, the benefits of balanced nutrition, a 4 star menu, the impact of malnutrition, prevention of stunting, and complementary feeding of breast milk. The variable studied was the level of influence of balanced nutrition education on the improvement of the mother's knowledge. The pre-test is given before counseling activities are carried out. Post-test is carried out after the counseling activity ends. There are 5 pre-test and post-test questions related to balanced nutrition given to children under five mothers with multiple choice answers with 3 categories, there are good category if the value ≥ 80 , the sufficient category if the value is 60-79, and the low category if the value is < 60 .

The characteristics of mothers under five that were observed in the study include the married age of mothers, the routine of Posyandu visits, and the mother's source of income. There is the following explanation of the characteristics of mothers under five based on the results of the questionnaires that have been distributed:

The distribution of the married age of mothers is grouped into 4 categories, there are 10-15 years, 16-19 years, and > 20 years. The routine of Posyandu visit is divided into 2 categories, there are routine visits to Posyandu and not regularly visiting Posyandu. The variable of mother's income is categorized into 2 categories, including having her own income and not having her own income.

Data analysis was carried out in the frequency distribution table including the characteristics of respondents and the knowledge level of children under five mothers. In addition, to make it easier to see the changes in the knowledge level of children under five mothers, a graph is used to show the level of knowledge of children under five mothers before and after being given balanced nutrition counseling. The data were analyzed using a dependent T-test to measure the differences in the mother's knowledge level after being given balanced nutrition counseling.

RESULT AND DISCUSSION

Mojo Village is a village located in Kalitidu District, Bojonegoro Regency. The distance of Mojo Village from the sub-district capital is about 10 km, from the capital city/regency about 14 km, and from the provincial capital, it is 152.9 km. Health problems in children under five that are still common in Mojo Village are related to nutritional problems. Based on the results of secondary data analysis in Mojo Village, it was found that 14.7% of children under five in Mojo Village experienced nutritional problems. Among children under five who experience nutritional problems, 7.35% are moderate thinness 1.47% are obese, 1.47% are short and 4.41% are mild thinness (Qolby, christin, etc, 2019).

Descriptive Analysis of Children Under Five Mother's Characteristics

Table 1. The Distribution of Children Under Five Mother's Characteristics in Mojo Village in 2020

Respondent Characteristics	Percentage (%)
Age of the Married Mothers	
16-19 years	24.10%
20-25 years	75.90%
The Routine of Posyandu Visit	
Yes	96.60%
No	3.40%
Mother has her own source of income	
Yes	31.00%
No	69.00%

Based on table 1, it is known that the majority, the married age of mothers is 16-19 years (75.90%) and the remaining are married at the age of 10-15 years (24.10%). According to the BKKBN (Badan Kependudukan dan Keluarga Berencana) (2021) the ideal age for marriage is at least 21 years old. This is intended so that newly married couples have mature readiness to run the household, so the family can create a good relationship. The level of knowledge, experience, and motivation of children under five mothers behavior can be influenced by age factors (Putri, 2015). Age will affect the capture power and one's mindset towards information which are given.

Most of the children under five mothers have routinely come to Posyandu (96.60%) and the remaining 3.40% do not regularly come to Posyandu. Posyandu has an important role in improving the quality of maternal and child health through the health service process (Saepuddin, Rizal, and Rusmana, 2017). So, mothers who come regularly to Posyandu will have more health information than mothers who do not regularly come to Posyandu.

Most of the children under five mothers did not have their own source of income (69.00%) and the remaining (31.00%) had their own source of income. The level of family income can affect the fulfillment of children under five nutrition, both in quantity and quality. The higher the income, the greater the percentage of that income is used to buy fruit, vegetables, and various other types of foodstuffs (Kasumayanti and Aulia, 2020). The level of family income is not directly related to the knowledge of the children under five mothers but can be related to the attitudes and behavior of fulfilling nutrition in children under five mothers (Nugrahaeni, 2018).

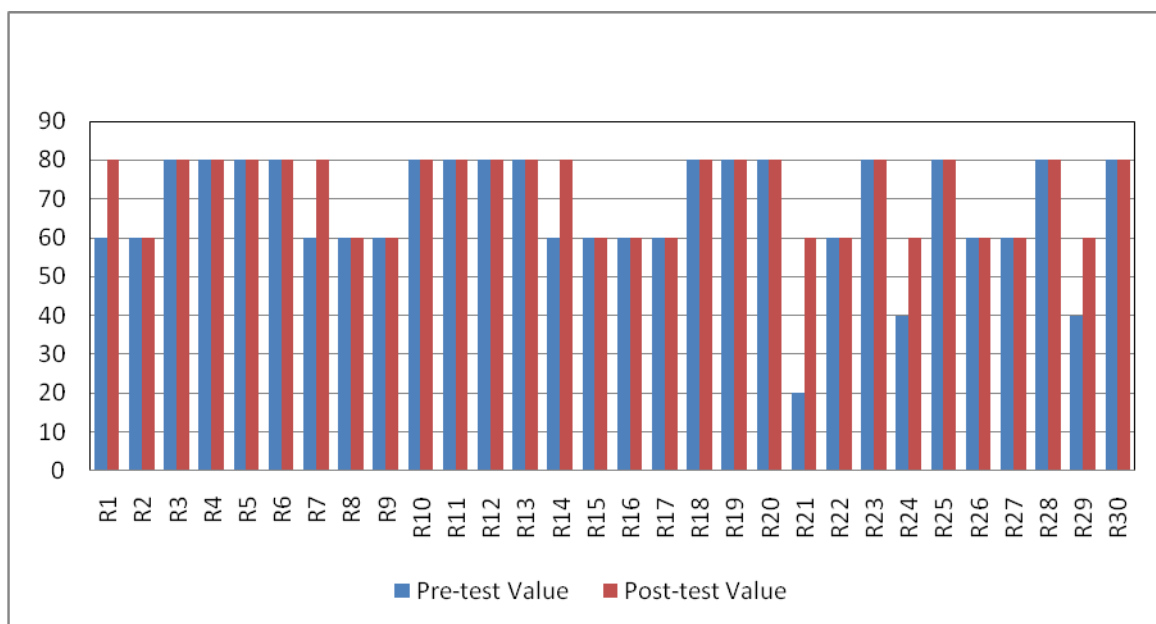
Table 2. The knowledge of Children Under Five Mothers Before and After Counseling

Knowledge of Children Under Five Mothers	Pre-test		Pos-test	
	Frequency	Percentage	Frequency	Percentage
Good	15	50%	18	60%
Sufficient	12	40%	12	40%
Low	3	10%	0	0%
Total	30	100%	30	100%

Based on table 2 above, before the balanced nutrition counseling was carried out, 50% of mothers had a good level of knowledge. After being given counseling, the level of mothers knowledge in a good category increased to 60%. Mothers with a sufficient level of knowledge had a fixed number of 40% and mothers who had a low level of knowledge before counseling were 10% become 0%.

The information conveyed directly by the speaker allows mothers to receive information more easily. During the counseling sessions, the mothers were also allowed to ask for information about what they did not understand. This is in line with Arsyati (2019) which states that the willingness of children under five mothers to monitor and follow the prevention efforts can increase the knowledge of children under five mothers.

Education is needed in assisting health and nutrition to change behavior that can lead to the improvement of nutritional health for mothers and their children. This is supported by the results of research by Chandradewi, Darawati, and Salam (2012) in Selagalas Village, Mataram City in 2011, a good pattern of complementary feeding before counseling was 12.7%, 66.7% adequate, and 20.6% less. Meanwhile, after counseling, the pattern of offering good MP-ASI becomes 74.6%, the MP-ASI pattern is only 20.6%, and the less is 4.8%.



Picture 1. Graph of Balanced Nutrition Knowledge Pre-test and Post-test Values

Picture 1 shows the values of pre-test and post-test by 30 children under five mothers (R1-R30) in Mojo Village. The picture indicate that some of the children under five mothers had the same pre-test and post-test

values and the other had an increased level of values. So, balanced nutrition counseling can increase the knowledge of children under five mothers on balanced nutrition.

Table 3. The Effect of Balanced Nutrition Counseling on Children Under Five Mother's Knowledge

Variable	N	Mean \pm SD		P-Value
		Before	After	
Knowledge of Balanced Nutrition	30	67.33 \pm 15.30	72.00 \pm 9.90	0.02

Table 3 shows the increase of balanced nutrition knowledge among children under five mothers in Mojo Village before and after counseling using dependent T-test. The results of this study indicate that balanced nutrition counseling as an effort to increase the knowledge of mothers under five can significantly increase the knowledge of mothers under five (p-value = 0.02). Before counseling was carried out, the average value of mothers under five was 67.333 \pm 15.3 and after counseling it increases to 72.00 \pm 9.9. This is supported by Rachmah's (2020) research in Gempolmanis Village, Sambeng District, Lamongan Regency which shows that nutrition education can increase the level of children under five mother's knowledge with a p-value <0.05.

The results of this study are also supported by (Syafiriani, 2016) research on the effectiveness of counseling for children under five mothers about the balanced menu of children under five at Posyandu Melati Desa Muara Langsat Kuantan Singingi by obtaining an increase in the average score of knowledge during pre-test and post-test with values significant, p-value = 0.000 (p <0.05). The average score of knowledge in pre-test is 0.44 and the average knowledge score in post-test is 1.08. This means that there is effectiveness of counseling on the knowledge of mothers under five about a balanced menu for children under five (Syafiriani, 2016). Health counseling is a delivery of information related to health so that it can affect knowledge (Ernawati, 2013).

Knowledge has a close relationship with the fulfillment of children under five's nutrition. Therefore, it is necessary to have regular and continuous education to provide understanding to children under five mothers. This is supported by Astuti's (2020) statement which states that children under five mothers need the latest knowledge because knowledge is always developing. Health counseling is a form of health education that can be carried out by providing understanding to children under five mothers.

Health counseling not only affects the increase of children under five mother's knowledge but also affects the attitudes of the mother, thereby giving rise the motivation to prevent stunting. The level of children under five knowledge regarding nutrition affects children's consumption habits (Yabancı, Kışaç and Karakuş, 2014). Counseling and education can influence a person's knowledge and attitudes in acting so that they become behavioral patterns that change for the better (Kustiani and Misa, 2018).

According to Puspasari and Andriani (2017), a good mother's knowledge will affect the behavior of mothers in choosing and providing food for their children both in quality and quantity so that the nutritional adequacy rate is needed by children under five can be fulfilled and their nutritional status is good. This is supported by Syahrani's (2018) statement, the nutritional status of children under five can be influenced by the level of knowledge the mother has. This shows that health education, both through formal and non-formal education such as counseling, has a close relationship with the mother's level of knowledge and behavior patterns in meeting the nutritional needs of her child.

The strength of this research is that the problems raised are following the facts that occur in the community. In addition, the analysis of the research results is complemented by comparisons with previous studies that have been carried out so that accurate results are obtained. However, this research also has several weaknesses that need to be corrected in the future, including the need for monitoring the attitudes of children under five mothers which are carried out within a certain period time to determine changes in attitudes after counseling. In addition, research questionnaires need to be developed so that they can cover more comprehensive knowledge of balanced nutrition.

This research can be used as a basis for providing education to children under five mothers in Mojo Village because it has been proven to significantly increase children under five mother's knowledge regarding balanced nutrition. Counseling is an alternative activity that can be carried out. Puskesmas nutrition officers and Posyandu cadres have an important role in providing nutrition education to children under five mothers to prevent malnutrition in children under five.

CONCLUSION

This study concludes that the provision of balanced nutrition education in Mojo Village is significantly associated with the increase of children under five mother's knowledge. This is evidenced by the existence of a significant difference in the results of statistical tests of children under five mother's knowledge before being given counseling and after being given counseling on balanced nutrition (P<0.05). Puskesmas nutrition officers

and Posyandu cadres have an important role in providing nutrition education to children under five mothers to prevent malnutrition in children under five.

ACKNOWLEDGEMENT

The author would like to thank the apparatus and the community of Mojo Village, Kalitidu District, Bojonegoro Regency for permitting to be used as a place for research and also the assistance that has been done a lot. The researcher also thanked PKL FKM UNAIR students who had helped in data collection. Thank you to the supervisor for the criticism and suggestions that have been given so that the preparation of this article can be completed properly.

REFERENCES

- Arsyati, A. (2019) 'Pengaruh Penyuluhan Media Audiovisual dalam Pengetahuan Pencegahan Stunting pada Ibu Hamil di Desa Cibatok 2 Cibungbulang', *PROMOTOR Jurnal Mahasiswa Kesehatan Masyarakat*, 2(3), pp. 182–190. Available at: <http://ejournal.uika-bogor.ac.id/index.php/PROMOTOR>.
- Astuti, D. P. (2020) 'Pencegahan Stunting Melalui Kegiatan Penyuluhan Gizi Balita dan Pemberian Makanan Tambahan Berbasis Kearifan Lokal di Posyandu Desa Madureso', *University Research Colloquium*, pp. 74–79.
- Badan Perencanaan Pembangunan Nasional (2011) *Rencana Aksi Pembangunan Nasional Pangan dan Gizi 2011-2015*, <https://www.bappenas.go.id/id/berita-dan-siaran-pers/kegiatan-utama/rencana-aksi-nasional-pangan-dan-gizi-2011-2015/>. Available at: <https://www.bappenas.go.id/id/berita-dan-siaran-pers/kegiatan-utama/rencana-aksi-nasional-pangan-dan-gizi-2011-2015/>.
- BKKBN (Badan Kependudukan dan Keluarga Berencana) (2021) *BKKBN : Usia Pernikahan Ideal 21-25 Tahun*, <https://www.bkkbn.go.id/detailpost/bkkbn-usia-pernikahan-ideal-21-25-tahun>.
- Chandradewi, A., Darawati, M. and Salam, A. (2012) 'Pengaruh Penyuluhan Gizi terhadap Pola Pemberian MP-ASI, Berat Badan, dan Status Gizi Anak Usia 6-24 Bulan di Kelurahan Selagalas Kota Mataram', *Kesehatan Prima*, 6(1995), pp. 849–859.
- Dinas Kesehatan Provinsi Jawa Timur (2018) *Profil Kesehatan Jawa Timur 2018*. Surabaya.
- Ernawati (2013) 'Pengaruh Penyuluhan Kesehatan terhadap Peningkatan Pengetahuan Ibu Tentang Status Gizi Balita di Posyandu Wilayah Kerja Puskesmas Antang Perumnas Makassar', *ISSN-2302-1721*, 2, pp. 1–5.
- Fatmawati, R. (2014) 'Pengaruh Penyuluhan Gizi terhadap Pengetahuan Dan Sikap Ibu dalam Pemberian Menu Seimbang pada Balita di Dusun Tegalrejo, Pleret, Bantul, Yogyakarta Tahun 2014', *Program Studi Diploma IV Bidan STIKES 'Aisyiyah Yogyakarta*.
- Kasumayanti, E. and Aulia, M. (2020) 'Hubungan Pendapatan Keluarga dengan Status Gizi Balita di Desa Tambang Wilayah Kerja Puskesmas Tambang Kabupaten Kampar Tahun 2019', *Jurnal Ners Universitas Pahlawan*, 4(1), pp. 7–12.
- Kementerian Kesehatan RI (2018a) *Cegah Stunting dengan Perbaikan Pola Makan, Pola Asuh dan Sanitasi*, <https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20180407/1825480/cegah-stunting-dengan-perbaikan-pola-makan-pola-asuh-dan-sanitasi-2/>.
- Kementerian Kesehatan RI (2018b) *Riskesdas 2018*. Jakarta.
- Krisnansari, D. (2010) 'Nutrisi dan Gizi Buruk', *Mandala of health*, 4(1), pp. 60–68.
- Kustiani, A. and Misa, A. P. (2018) 'Perubahan Pengetahuan, Sikap, dan Perilaku Ibu dalam Pemberian MP-ASI Anak Usia 6-24 Bulan pada Intervensi Penyuluhan Gizi di Lubuk Buaya Kota Padang', *Jurnal Kesehatan Perintis (Perintis's Health Journal)*, 5(1), pp. 51–57.
- Nugrahaeni, D. E. (2018) 'Pencegahan Balita Gizi Kurang Melalui Penyuluhan Media Lembar Balik Gizi', *Amerta Nutr*, pp. 113–124. DOI: 10.20473/amnt.v2.i1.2018.113-124.
- Puspasari, N. and Andriani, M. (2017) 'Hubungan Pengetahuan Ibu tentang Gizi dan Asupan Makan Balita dengan Status Gizi Balita (BB / U) Usia 12-24 Bulan', *Amerta Nutrition*, 1, pp. 369–378.
- Putri (2015) 'Faktor-Faktor yang Berhubungan dengan Status Gizi Anak Balita di Wilayah Kerja Puskesmas Nanggalo Padang', *J. Kesehat. Andalas*, 4, pp. 254–261.
- Qolby, christin, etc (2019) *Laporan praktik kerja lapangan*. Surabaya.
- Rachmah, Q. (2020) 'Pendidikan Gizi Gemar Ikan sebagai Upaya Peningkatan Pengetahuan Ibu tentang Pencegahan Stunting di Desa Gempolmanis Kecamatan Sambeng Kabupaten Lamongan Privinsi Jawa Timur', *Amerta Nutrition*, 4, pp. 165–170. doi: 10.20473/amnt.
- Rahmawati, Ira, dkk (2007) 'Pengaruh Penyuluhan dengan Media Audio Visual terhadap Peningkatan Pengetahuan, Sikap dan Perilaku Ibu Balita Gizi Kurang dan Buruk di Kabupaten Kotawaringin Barat Propinsi Kalimantan Tengah', *Jurnal Gizi Klinik Indonesia*, 4(2), pp. 69–77.
- Rini, R. P. (2016) *Pengaruh Penyuluhan Gizi terhadap Pengetahuan Ibu dalam Pemberian Menu Seimbang Pada Balita di Dusun Jamprit Pundong Bantul Yogyakarta Tahun 2016*. Yogyakarta.

- Saepuddin, E., Rizal, E. and Rusmana, A. (2017) 'Peran Posyandu sebagai Pusat Informasi Kesehatan Ibu dan Anak', *e-ISSN 2442-5168*, 3(2), pp. 201–208. doi: 10.20473/rlj.v3-i2.2017.201-208.
- Syafiriani (2016) 'Efektifitas Penyuluhan terhadap Pengetahuan Ibu Balita tentang Menu Seimbang Balita di Posyandu Melati Desa Muara Langsat Kuantan Singingi 2016', *Jurnal Obsesi*, 2(2), pp. 1–7.
- Syahriani, M. N. (2018) 'Pengaruh Penyuluhan Kesehatan terhadap Pengetahuan dalam Pemberian Nutrisi Balita pada Ibu di Posyandu Kejibeling 13 Kota Yogyakarta', *universitas 'Aisyiyah Yogyakarta*.
- Yabancı, N., Kısaç, İ. and Karakuş, S. Ş. (2014) 'The Effects of Mother's Nutritional Knowledge on Attitudes and Behaviors of Children about Nutrition', *Procedia - Social and Behavioral Sciences*, 116, pp. 4477–4481. doi: 10.1016/j.sbspro.2014.01.970.