



## Linking ASI-Mobile Android-Based App on Mothers' Attitude and Behavior on Exclusive Breastfeed

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### Abstract

Exclusive breastfeeding within the Palangka Raya municipality is far below target, on which 14,99% (2016) and 16,76% (2017), respectively. There were several primary health has the feeding bout, only cover 2,58%. Due to a lack of mothers' knowledge, regarding beneficial and proper breastfeeding practices. Today's technology presumably has the advantages as promotional media. The study was aimed to quantify the android-based application, so-called ASI-Mobile, towards mothers' attitude and behavior, on exclusive breastfeeding within Jekan Raya district, Palangka Raya Municipality, Central Kalimantan. The Research was conducted in March – October 2019, using a quasi-experimental design, and the sample was 60 pregnant women, in the third trimester period, over the Jekan Raya District areas. ASI-Mobile was subjected to 30 pregnant women, while others 30 mothers by counseling, the conventional promotion type. Purposive sampling was used, their socio-economic was collected, descriptive analysis was conducted. Bivariate analysis, Wilcoxon ranked test was used to analyze the effect of the treatments. We've have found a significant link on ASI-Mobile application toward mothers' attitudes (p-value 0.046) and behavior (p-value 0.018). We concluded that the ASI-Mobile, an android-base application, is more effective towards shifting mothers' attitudes and behavior on exclusive breastfeeding within our study area.

### Introduction

Improving the quality of human resources is one of the directions of health development, where one indicator of its success is declining infant mortality rate (IMR) and improving the nutritional status of the community. One such effort is through the breast-feeding program (BF), as outlined in Government Regulation (PP) Number 33, 2012 on the provision of exclusive breast milk. The coverage of exclusive breastfeeding in Indonesia, at the national level, has reached 61.33%. The number has surpassed the strategic plan of 2017, at 44% (Kementerian Kesehatan RI, 2018). Nevertheless, the number of exclusive breastfeeding coverage in central Kalimantan in 2017 shows 11%, lower compared with the year 2016, which penetrated 20.5% (Dinas Kesehatan Provinsi

Kalimantan Tengah, 2018). Based on the profile of the city health Office of Palangka Raya (Dinas Kesehatan Kota Palangkaraya, 2018) the coverage of the exclusive breastfeeding in Palangka Raya city in 2017 amounted to 16.76% and 2016% for 14.99%. This figure indicates far below the national target of 80%. Health promotion is one of the efforts made for the dissemination of information and education on exclusive breast milk. The use of social media for health promotion is an emerging area of inquiry, showing that the use of social media for health promotion can increase participant engagement, and can provide a cost-effective tool to provide social support for individuals in the health sector, as well as to identify how to make the best use of social media as a health promotion tool (Jane, et al., 2018).

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The development of information technology can be used as a health promotion media, one of them by using Android application. Using SMS, effect of nutritional messages have adequate effects on awareness and dietary compliance in hypertensive patients (Merita, et al., 2019) . Nutrition education Media based on Android (Perdana, et al., 2017; Eliana & Kurniawati, 2015), increase knowledge, attitude, and practice of balanced nutrition in elementary school children. Also, (White, et al., 2016) expressed the findings and model of the application that they designed in such a way by basing into theory, and applied with the game model, can improve the role of the husbands to empowered their wives to breastfeed their newborn. Given that situation, it is alleged that, access to information through an Android-based application, can reach the

community quickly and able to contribute to awareness efforts, related to exclusive breastfeeding. Through this research, Android-based applications named ASI Mobile. The purpose of this research is to analyze the influence of Android-based Mobile application on the attitudes and behavior of pregnant women about the exclusive breastfeeding in Jekan Raya Sub-district

**Method**

The design of this research is quasi-experimental, consisted of two group comparison pre-test-post tests. One group was subjected to ASI-Mobile application, while the other group was subjected to conventional promotional methods, Counseling. Below is ASI-Mobile interface at a glance:



Figure 1. The ASI-Mobile application interface; (a) Menu; (b) Menu – continued; Each menu has informative; (c) Sub-Menu on ASI-Mobile icon and (d) Sub-Menu on Multimedia, contains Education Video.

The population of this study is the third trimester periods of pregnant women in Jekan Raya Sub-district. The determination of the sample, considering the minimum criteria for the two-sample hypothesis test is free of each other, with the value, average, and standard deviation (Hermina & Hidayat, 2011). Based on the formula, then the large sample in this study is as much as 27.66, equal to 30; so that the total sample is 60 individuals, purposively sampling. Questionnaires were also developed to assess the attitudes and behaviors of pregnant women regarding exclusive breastfeeding, through in-depth interviews. Qualified expectant mothers will be given an explanation of the research process to be carried out and asked for approval of the willingness to be respondents. Respondents are who have expressed a willingness to be divided into treatment groups and control groups. Moreover, before the intervention of treatment according to the method of each expectant mother who will be given treatment application of ASI-Mobile and pregnant women control group with conventional methods on breast counseling will be given a pretest questionnaire for the assessment of attitudes. After completing the pre-test questionnaire, each pregnant woman is explained the ASI-Mobile application on Android and how to operate the application.

Meanwhile, in pregnant women, the control group at the time of the visit will be provided with concessional information/counseling on exclusive breastfeeding. Furthermore, any expectant mothers who have been given application and counseling will be carried out a post-test assessment after childbirth or Nifas period and the age of the first week of infants (7 days) to assess the attitudes and behaviors of the exclusive breast milk. Data were analyzed using the Wilcoxon sign rank test

### Result And Discussion

As previously described, a study was subjected to two groups, using different promotional methods, here we provided the characteristics:

Table 1. Characteristics Respondents, Counseling (n:30) and ASI-Mobile app (n:30); DMW (Districts Minimum Wages)

Characteristics	Counseling	Application
Age		
Risk (< 20 years and > 35 years)	28 (46.7%)	28 (46.7%)
Un-Risk (20 - 35 years)	2 (3.3%)	2 (3.3%)
Education		
Basic - Middle	2 (3.3%)	8 (13.3%)
Higher Education	28 (46.7%)	22 (36.7%)
Occupation		
Work	4 (6.7%)	10 (16.7%)
Not Working	26 (43.3%)	20 (33.3%)
Parity		
Primigravida	6 (10%)	8 (13.3%)
Multigravida	24 (40%)	22 (36.7%)
Wages		
< DMW	20 (33.3%)	23 (38.3%)
≥ DMW	10 (16.7%)	7 (11.7%)

Source: Primary data, 2019

Table 1 shows that in sample groups given counseling guidance, from 30 the majority samples are included in the Age of risk (< 20 years and > 35 years) i.e. as many as 28 individuals (46.7%). Similarly, in the sample groups given the ASI-Mobile application, the majority are included in the Age of risk (< 20 years and > 35 years) i.e. as many as 28 individuals (46.7%). Reviewed from the characteristics of education, both sample groups have relatively equal characteristics i.e. the majority have a high level of education i.e. 28 individuals (46.7%) are on counseling groups and 22 individuals (36.7%) in the ASI-Mobile application group. Likewise, on the characteristics of the work, both groups have relatively identical characteristics. The sample group, which was given the majority counseling, did not work as much as 26 individual (43.3%) And in the ASI-Mobile application group as much as 20 individuals (33.3%).

Based on parity characteristics, both sample groups have relatively equal characteristics i.e. the Multigravida majority, which is as much as 24 individuals (40%) On counseling groups and 22 individuals (36.7%) In the ASI-Mobile application group. Similarly reviewed from the earning characteristics, both groups have relatively identical characteristics.

The sample group, given the majority counseling, has an income lower than District Minimum Wages (DMW), which is as much as 20 individuals (33.3%) And in the ASI-Mobile application group as much as 23 individuals (38.3%).

The analyses have revealed that sample group of pregnant mothers given counseling guidance, the average score of expectant mothers against exclusive breastfeeding at the time of pretests of  $75.7 \pm 4.9$ . After counseling or at the time of Posttest there was an increase in the average attitude score of  $77 \pm 4.7$ . Likewise, in the group of pregnant mothers given the ASI-Mobile application, there is an increase in the average attitude score against the exclusive breast milk, which at the time of the average pretests attitude score of  $73.3 \pm 5.9$  and at the time of posttest increased to  $79.6 \pm 5.3$ .

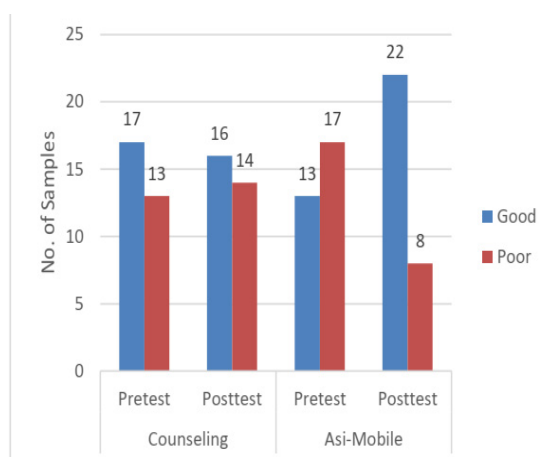


Figure 2. Descriptive on Pre-Test vs Post-Test on no. of Pregnant Women Attitudes as per Group

Based on Figure 2, it is shown that in a sample group of pregnant mothers given counseling guidance, the expectant mother's attitude toward exclusive breastfeeding before counseling (pretest) majority in the category of good is as much as 17 individuals. After being given counseling or at the time of the posttest there is not a lot of changes that there are 16 individuals who are in the good category. While in the group of pregnant mothers given the application of ASI Mobile, at the time of Pretest,

the majority of pregnant women have a poor attitude that is as many as 17 individuals and expectant mothers who have a good category of 13 individuals. Once given the ASI-Mobile application, there is an increase in the number of pregnant women who have a good category attitude as much as 22 individuals. Mothers who have a less good category attitude decline to 8 individuals.

To test the influence of counseling on the expectant mother's attitudes towards exclusive breastfeeding, use the t-test in pairs. The testing process is conducted by comparing the attitude score before and after counseling. Based on the test results of the comparison of expectant mothers before the after counseling, it is shown that the average score of expectant mothers against exclusive breastfeeding at a pretest of  $75.7 \pm 4.9$ . After counseling or at the time of Posttest there was an increase in the average attitude score of  $77 \pm 4.7$ . By using the t-test in pairs gained a P-value of 0.290 ( $p > 0.05$ ) which indicates there is no significant difference in the average score between before with the after counseling. In other words, counseling does not prove to improve the attitude of the mother significantly.

To test the influence of counseling on the expectant mother's attitudes towards exclusive breast milk, use the t-test in pairs. The testing process is conducted by comparing the attitude score before and after counseling. Based on the test results of the comparison of pregnant women's attitudes before the after given the application of ASI Mobile, it is shown that the average score of expectant mothers against exclusive breastfeeding at the pretests of  $73.3 \pm 5.9$ . Once given the ASI-Mobile application or at the time of the posttest, there is an increase in the average attitude score of  $79.6 \pm 5.3$ . By using the paired T-test, you get a P-value of 0.000 ( $P < 0.05$ ) which indicates that there is a significant difference in the average attitude score between before with the after given ASI-Mobile application. In other words, giving the ASI-Mobile app proved to improve the attitude of the mother significantly.



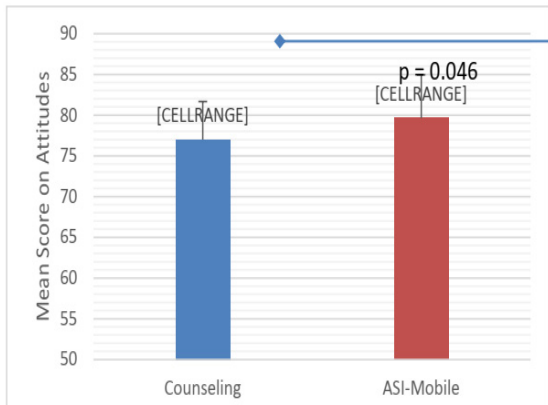


Figure 3. A Pairwise comparison as per methods been deployed

Based on the results of the test comparison of the expectant mother's attitude after counseling with after given the ASI-Mobile application, it is shown that the average expectant mother's attitude towards exclusive breastfeeding in counseling groups amounted to  $77 \pm 4.7$  and in the Mobile application group of  $79.6 \pm 5.3$ . By using the paired t-test, we have calculated the p-value of 0046 ( $P < 0.05$ ) which indicates there is a significant difference in the average attitude score between the counseling groups with the ASI-Mobile application group where the average ASI-Mobile application group score is higher than the counseling group. In other words, the test is evidenced that the delivery of Mobile applications proved more effective in enhancing the expectant mother's attitude towards exclusive breastfeeding. Testing the influence of counseling and ASI-Mobile application is done by nonparametric using the Chi-Square test (Table 2).

Table 2. Chi-square Test on the Effect on Exclusive Breastfeeding as per Methods

Exclusive breastfeeding	Group		p-value
	Counseling	ASI-Mobile	
- Yes	13 (21,7%)	22 (36,7%)	0,018
- No	17 (28,3%)	8 (13,3%)	

Source: Primary data analysis, 2019

Based on the test results of the influence of ASI-Mobile and counseling for the mother's behavior in providing exclusive breastfeeding in Table 2, it was shown that in the counseling group, from 30 research samples, mothers who

gave the exclusive ASI as much as 13 people (21.7%) And as many as 17 people (28.3%) do not provide exclusive breast milk. Different in the ASI-Mobile application group, there are 30 research samples, as many as 22 people (36.7%) Mothers who give exclusive ASI, only 8 people (13.3%) which is not. Using the Chi-Square test, you get a P-value of 0.018 ( $P < 0.05$ ) which indicates the difference in the behavior of mothers given counseling with ASI-Mobile application in providing exclusive breast milk. From this test, it is evidenced that the delivery of ASI-Mobile application is more effective in shaping the behavior of mothers to provide exclusive breastfeeding.

The characteristics of sample research in general show similarities, whether it is age, education, occupation, parity, and income. An overview of the mother's attitude towards exclusive breastfeeding before and after the intervention meets the rules of normality. The results showed that there were no significant differences in the average attitude between before with the following counseling. In other words, counseling does not prove to improve the attitude of the mother significantly. The result was not similar, regarding the effectiveness (Aprilina & Linggardini, 2015) stating that there was a difference in maternal attitudes after lactation counseling. Counseling is an opportunity to discuss various matters, such as preconceptual health issues, because three out of four mothers stated that PPRK should be part of their routine when visiting midwives so that the patient's problems can be properly consulted with the midwife (Skogsdal, 2019). The counseling process cannot run effectively because the midwives do not involve the mother during counseling so that mothers tend to be listeners and lack the skills of midwives as counselors in asking open questions or two-way communication failures. Also, the exclusive knowledge and practice of breast-feeding that are largely not exclusive to other factors form a mother's attitude towards exclusive breast milk. Counseling is also a very important role in increasing the knowledge of mothers, so the more often information (Ambarwati, 2013).

However, the difference is indicated by a tie-in t-test result, in which a group of mothers using the ASI-Mobile application shows

meaningfulness of increased attitudes, before and after the intervention (Figure 3). This meaninglessness is also found in comparison to the effectiveness of counseling with ASI-Mobile application in the contribution to the attitude of the mother to exclusive breastfeeding (Figure 4). Based on this, the findings have a corresponding implication on which researcher experimented on the millennial mother (whom birth between 1980 and 1994), through two ways of providing information (Beard, 2014). The first information by providing a short message (SMS) and the second way with an application program that comes with video features (YouTube®). Results show that by using an application program, equipped with accessible features, contributes to an increase in nursing mothers by 11.72% in 3 years. The need for information tends to fulfill each individual, unique, and not the same (Coughlin, 2016). It is further reported, that the attitude is personal, and of course, leads to changing attitudes. Noting the characteristics of research samples, during the study period, some considerations, especially for the achievement of health objectives relating to breastfeeding policy, are access to present information, no longer static; One-way consulting process has begun irrelevant. Based on the results of the research of ASI-Mobile application is more effective in shaping the behavior of mothers to provide exclusive breastfeeding.

In this study, the behavior of mothers in delivering exclusive breastfeeding is measured at the time after childbirth and the age of the first week of baby 7 days (Table 2). These results show the meaninglessness of behavior ( $p$ -value value 0.018). This suggests that changes in attitudes as discussed earlier will affect behavior. In the 2 groups acquired behavioral data with different proportions. The Counseling Group (n:30 people) gives the exclusive breastfeeding as much as 13 people (21.7%) And who did not provide exclusive breastfeeding of 17 people (28.3%). Meanwhile, in the application group, as many as 22 people (36.7%) Provide exclusive ASI, the remaining 8 people do not give exclusive ASI. This suggests that treatment with an application gives a better influence when compared to behavioral-related counseling. However, the results of this

research show some things i.e. giving mothers excuses not to give exclusive breastfeeding they have given access to the application. The most common reason is that breastfeeding has not come out/Little (n: 7 people) and 1 person is grounded because of the way of childbirth with the Caesarian section (SC). As presented, more than 7 of those mothers with a history of multigravida parity. The implication that access to information does not affect behavior and it is presumed that mothers base on previous habits or experiences. However, in general, the use of applications in this research influences behavioral changes in the granting of exclusive breast milk. There was a tendency to inconsistent behavior in providing exclusive breastfeeding when the mother faced problems such as milk has not come out, very little, nipple forms, and abrasions (Ambarwati, 2013). Moreover, fussy children have lack of support from husbands, families, and health officers. Mothers who successfully give breastfeeding as early as possible without giving food or pre-lacteal drink for 1 week after childbirth are mothers who get full support from the family especially the husband (Liliana, et al., 2017). Another findings and model of the application that they design in such a way by basing the theory, and applied with the game model, can improve the role of the husband, to encourage the wife to give exclusive breastfeeding to the baby (White, et al., 2016).

Breastfeeding is also linked to health outcomes in women. This can speed up the postpartum period, and return to pre-pregnancy weight. It can also reduce the risk of postpartum depression, type II diabetes, metabolic syndrome, and breast and ovarian cancer. In many cases, the health benefits of breastfeeding are increased according to the duration and exclusivity of breastfeeding in the first six months. However, breastfeeding rates (especially for exclusive breastfeeding) worldwide are less than optimal (Zielinska, 2017). The family, in this case, Father (husband), has an important role in the exclusive ASI decision. The implication of this research suggests the need for information, but not limited to mother. Father (husband) is precisely a role in reminding the importance of exclusive breastfeeding for babies. Researchers

have been studied how a father engages with things related to breastfeeding, by giving them challenges (Bien & Davies, 2014). The result gives a positive signal, that the father, needs two things, that is information that is always available (through gadgets) and access to health workers for consultation. Furthermore, it confirms that the role of father as a partner in decision making, and of course, is responsible for the intake of infants through breast milk, in helping to remind the importance of it to their respective spouses.

### Conclusion

We can conclude that there were no significant differences in the average attitude between before with the following counseling. In other words, counseling does not prove to improve the attitude of the mother significantly. Also, ASI-Mobile application is proven to be more effective in improving expectant mothers' attitudes towards exclusive breastfeeding (p-value 0.046). Moreover, the delivery of ASI-Mobile application is more effective in shaping the behavior of mothers to provide exclusive breastfeeding (p-value 0.018).

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### References

- Ambarwati, R., 2013. The Effect of Intensive Lactation Counseling on Exclusive Breastfeeding (ASI) for Up to 3 Months. *Journal of Nutrition Indonesia*, 2(1).
- Aprilina, H.D., & Linggardini, K., 2015. The Effectiveness of Lactation Counseling on Knowledge and Attitudes of Third Trimester Pregnant Women. *Scientific Journal of Health Sciences*, 13(1).
- Barriere, H., Tanguy, M., Connan, L., Baron, C., & Fanello, S., 2011. Prenatal breastfeeding information : Survey in Pays de Loire, France. *Archiver de Pediatrie*, 18, pp.945-954.
- Beard, M., 2014. "Bfed" Texting Program and "Breastfeeding: A Smart Choice" class : Using Cell phones to reach Gen Y Mother. *Clinical Lactation*, 5(4).
- Biancuzzo, M., 2000. *Breastfeeding the Newborn Clinical Strategies for Nurses*. 1 ed. Saint Lois, Missouri USA: Mosby Inc..
- Bien, A., & Davies, R., 2014. Father's Experiences of Supporting Breastfeeding: Challengges for Breastfeeding Promotion and Education. *Maternal and Child Nutrition*, 10, pp.510-526.
- Bien, A., Rzonca, E., Zarajczyk, M., Iwanowicz-Palus, G.J., & Kozak, A., 2016. The Role of the Media in the Promotion of Breastfeeding. *Pol. J. Public Health*, 126(3), pp.103-106
- Coughlin, S.S., 2016. The Need for Research-tested Smartphone Application for Promoting Breastfeeding. *mHealth*, 2(18).
- Dinas Kesehatan Kota Palangkaraya., 2018. *Profil Kesehatan*, Palangkaraya. Dinas Kesehatan Kota Palangkaraya
- Dinas Kesehatan Provinsi Kalimantan Tengah., 2018. *Profil Kesehatan*, Palangka Raya: Dinas Kesehatan Provinsi Kalimantan Tengah
- Edmond, K.M., Zandoh, C., Quigley, M.A., Amenga-Etego, S., Owusu-Agyei, S., & Kirkwood, B.R., 2006. Delayed Breastfeeding Initiation Increases Risk of Neonatal Mortality. *Pediatrics*, 117(3).
- Eliana, D., & Kurniawati, T., 2015. Differences in Knowledge and Perceptions of Pregnant Women on the Application of the SMS Gateway Model. *Journal of Public Health KEMAS*, 10(2), pp.203-209.
- Hermina, N.F., & Hidayat, T.S., 2011. The Information Factor of Breastfeeding and Complementary Foods Related to the Practice of Exclusive Breastfeeding in the Province of East Nusa Tenggara (Studies in Kupang City and Kupang Regency). *Bul. Health Research*, 39(1), pp.22-33.
- Jane, M., Hagger, M., Foster, J., Ho, S., & Pal, S., 2018. Social media for health promotion and weight management: a critical debate. *BMC Public Health*, (2018), 18:932.
- Kementerian Kesehatan RI., 2018. *Indonesia Health Profile*. Jakarta: Ministry of Health of the Republic of Indonesia.
- Kharisma, D.N., & Yuliatni, P.C.D., 2017. Proportion of Exclusive Breastfeeding for Children Aged 7-24 Months in Selat Village, Susut District, Bangli Regency in 2015. *E-Jurnal Medika*, 5(11).
- Lawrence, R., 2004. *Breastfeeding A guide for Medical Profession*. 6 ed. St. Lois: CV. Mosby.
- Liliana, A., Hapsari, E.D., & Wisman, W.A., 2017.

- Effect of Lactation Counseling on the Ability and Success of Mothers in Breastfeeding. *Nursing Journal of Respati*, 4(2), pp.189-193.
- Martin, R.M., Gunnell, D., & Smith, G.D., 2006. Breastfeeding in Infancy and Blood Pressure in Later Life Systematic Review an Meta Analysis. *American Journal of Epidemiology*, 161(1), pp.15-26.
- Merita., Iswanto., Kasyani., Fitriana, R., & Wahyu, Z., 2019. SMS Gateway as a Media to Improve Awareness and Dietary Compliance of Hypertensive Patients. *Journal of Public Health KEMAS*, 15(2), pp.286-294.
- Mwantimwa, K., & Mwaisela, N., 2018. Demographic Determinants of Access to and Usage of Breastfeeding Information Among Parents in Mbeya City, Tanzania. *University of Dar es Salaam Library Journal*, 13(1), pp.20-35.
- Perdana, F., Madanijah, S., & Ekayanti, I., 2017. The Development of Nutrition Education Media Based on Android and Website and. *J. Gizi Pangan*, 12(3), pp.169-178.
- Sholikah, M.B., 2018. Relationship of Birth Attendants in Early Breastfeeding Initiation and Support of Health Workers with Maternal Behavior in Exclusive Breastfeeding. *Nursing Journal of Muhammadiyah*, 3(2).
- Skogsdal, Y., Fadl, H., Cao, Y., Karlsson, J., & Tyden, T., 2019. An Intervention in Contraceptive Counseling Increased the Knowledge About Fertility and Awareness of Preconception Health-a randomized Controlled Trial. *Upsala Journal of Medical Sciences*, 124(3), pp.203-212.
- Vila-Candel, R., Sanchez, C.E., & Soriano-Vidal, F., 2017. Cuáles Son Los Principals Motivos de Consulta de un Blog Relacionado Con el Embarazo, el Parto y la Lactancia?. *Matronas Prof*, 18(2), pp.e32-e38.
- White, B.K., Martin, A., White, J.A., Burns, S.K., Maycock, B.R., Giglia, R.C., & Scott, J.A., 2016. Theory-based Design and Development of a Socially Connected, Gamified Mobile App for Men About Breastfeeding (Milk Man). *JMIR mHealth and Uhealth*, 4(2), pp.e81.
- Zielinska, M.A., Sobczak, A., & Hamulka, J., 2017. Breastfeeding Knowledge and Exclusive Breastfeeding of Infants in First Six Months of Life. *BY-NC*, 68(1), pp. 51-59.