ANALYSIS OF THE USE OF MENSTRUAL PAD, TAMPONS, AND MENSTRUAL CUP DURING MENARCHE

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ABSTRACT

Various kinds of alternative product innovations have been to substitute disposable sanitary napkins for reducing the increasing waste of disposable sanitary napkins and reduce environmental pollution. The products in question include, among others, menstrual cups, tampons. Tampons and menstrual cups are still rarely used by Indonesian women because there is little knowledge about menstrual hygiene and how to use them are still considered taboo. The objective of the study is to compare the analysis of the use of sanitary napkins, tampons, and menstrual cups during menarche. The method used in this study is a literature study from the journal published in 2015-2020. The database was from Ebsco, ProQuest, and Science Direct database, and 231 articles were obtained and filtered so that the final result were 12 articles that matched. The results of the comparison of the use of sanitary napkins, tampons, and menstrual cups in terms of hygiene and safety, environmental impact, and effectiveness showed that menstrual cups were superior to the other two products. In conclusion, the alternatives menstrual sanitation tools besides sanitary napkins are tampons and menstrual cups. This paper can be the basis for further research using different research designs to obtain more complete data.

KEYWORD

Menstrual cups; Sanitary napkins; Tampons, Literature Review

INTRODUCTION

Menstruation is the discharge of blood from the vagina that occurs every month the egg cells is not fertilized. The wall of the uterus (endometrium) contains blood vessels [1]. Efforts to maintain reproductive health are by taking Menstrual Hygiene measures. One aspect of menstrual hygiene management is the use of sanitary napkins. Sanitary napkins are products such as sheets/pads, pads made of cellulose, or synthetic materials, used to absorb menstrual blood. The use of sanitary napkins during menstruation will be in direct contact with the surface of the female organs which is very sensitive, so it must be hygienic. Long-term use of disposable pads can cause health problems for women and the environment [2].

The results of research conducted by Unicef related to menstrual hygiene management in Indonesia in 2015, as many as not namely ≥ 99% of respondents in urban areas and ≥97% of respondents in rural areas used disposable sanitary napkins while menstruating. Disposable sanitary pads are popular with women because they are more absorbent than other materials and are easier to put on and throw away. Statistical data for 2010 shows the number of Indonesian women is 118,048,783 people and of childbearing age as many as 67.4 million people [3].

If it is multiplied by the number of women in Indonesia, which according to data from BPS and the United Nations Population Fund has reached 131.88 million people, this waste will fill the land and cause major problems for the environment [4]. Various kinds of alternative product innovations have been created as a substitute for disposable sanitary napkins. These products include tampons and menstrual cups [5]. Considered very practical, Tampons are also recognized as cleaner than wearing sanitary napkins because there is no menstrual blood in contact with the vagina for hours, so it does not cause a fishy smell or rash. Tampons must be changed no later than 6 hours. If women are late changing tampons can cause the risk of Toxic Shock Syndrome (TSS). In addition, tampons are very expensive in Indonesia [6]. Tampons must be inserted into the vagina, for Indonesians, putting something in the vagina is taboo. There is a concern if tampons tear the hymen[7].

Another option that is said to be healthier is to use menstrual cups. A menstrual cup is made of rubber or silicone that meets medical standards. To use it, insert it into the vagina like a tampon. The difference is that if the tampon absorbs, the menstrual cup will work by collecting menstrual blood.

The menstrual cup has various advantages, such as saving budget, safer, and is not at risk of bacterial infection, and also does not cause adverse impacts on the environment [8].

However, most women in Indonesia still often use sanitary napkins. Meanwhile, tampons and menstrual cups are still rarely used because of the lack of knowledge about menstrual hygiene. Using them is still considered taboo, causing the two menstrual products to be paid less attention to by the Indonesian people. Based on the description described above, it is necessary to summarize the literature which aims to identify "Analysis of the use of sanitary napkins, tampons, and menstrual cups during menarche" in terms of cleanliness, comfort, environmental impact, and the effectiveness of using tools.

MATERIALS AND METHODS

The search for literature reviews was carried out in October-November 2020. The data were obtained from the other previous research results. of research that had been conducted by previous researchers. The source of the data obtained is in the form of articles on well-known international journal databases with topics that have been determined by the researchers. Search for articles using boolean operators and keywords that match Medical Heading (MeSH): effectiveness OR impact, menstrual pads, menstrual cups, tampons, menarche. The inclusion criteria in this study are: the content and title of the article must be under the research objectives, namely the advantages of sanitary napkins, tampons and menstrual cups in terms of cleanliness, comfort, environment impact and effectiveness of use. use English and the articles must be full text, female respondents who experience menstruation, research articles published in 2015-2020.

Based on the results of a literature search through remotexs.ub.co and selecting 3 databases, namely: Ebsco, ProQuest, Science Direct and researchers found 231 articles that matched these keywords. Then, the articles are checked to see if there are any similar. Furthermore, the same 51 articles were issued. So the remaining 180 articles. Then the researchers filtered the title (n = 175), abstract (n = 60), and full text (n = 12), and adjusted them according to the subject of literature review. The method used in all studies (n=12) is the methodological quality analysis, use a critical appraisal checklist with several questions asked to assess the quality of the research (Picture 1).

RESEARCH RESULT

Twelve journal articles that meet the results of the inclusion criteria are divided into 3 sub-discussions consisting of cleanliness and safety, impact on the environment, and effectiveness based on the topic of literature review that is Analysis of the use of menstrual pads, tampons, and menstrual cups. Nearly 33% of the studies conducted in literature reviews were published in 2020 with most studies using the Kemmis and Taggart model designs and almost all of the research in articles (75%) and using a simple random sampling design model as much as 67%. Most of the research was conducted by observation, interviews, and questionnaires. Based on a literature review of 12 articles, 4 articles were comparing the use of sanitary napkins and menstrual cups; 2 articles comparing tampons and menstrual cups; 4 articles comparing the use of pads, tampons, and menstrual cups; and 2 articles discussing tampon use. From 12 articles related to 3 sub-discussions, 4 categories of related articles discussions are obtained, namely: 4 articles discussing cleanliness and safety; 3 articles discussing effectiveness, cleanliness, and safety; 2 articles discussing impacts on the environment, 3 articles discussing effectiveness (Table 1).

DISCUSSION

Cleanliness and security

From the analysis of the researchers regarding the three menstrual sanitation devices in terms of hygiene and safety, it was found that sanitary napkins, tampons, and menstrual cups were dangerous if they exceeded the usage time limit because they would have an impact on the emergence of urinary tract infections and reproductive tract infections. The use of sanitary napkins is good to use at least 3 menstrual pads/day. However, this doesn't apply if on the first day a woman experiences menstruation, she can use more than 4-5 menstrual pads/days if the menstrual blood produced its very large[9].

Tampons are good to use for 6 hours, so in a day we can use up to 4 tampons. Tampons should not be used for more than 6 hours because they can cause TSS. This has been reinforced by the results of

research which states that if a tampon is used for more than 8 hours it can cause TSS. In addition, the use of tampons is not recommended when you are not menstruating or if the menstrual blood rate is low, and avoid using tampons during the night's sleep because it can put you at risk of more than 6 hours of use [10].

Meanwhile, the menstrual cup should be used for 4-12 hours and then removed to empty the blood that is collected in the cup[11]. Menstrual cups are also at risk for TSS, because the TSS bacteria will enter along with the air that enters the menstrual cups container and then the menstrual cup is used into the vagina. Intravaginal sanitizers such as tampons and menstrual cups run the risk of inducing TSS by acting as a medium for bacterial growth. From the composition of the ingredients, pads and tampons contain dangerous ingredients including chlorine, dioxin, and rayon. Dioxins are potentially carcinogenic and toxic to the immune and reproductive systems. Menstrual cup is good for the human body because it doesn't contain fragrance, chlorine, bleach and other chemicals. Menstrual cups are made of thermoplastic elastomer (TPE).

Environmental impact

A bandage is 90% made of plastic. Meanwhile, one pack or one pack of sanitary pads is equivalent to 4 plastic bags. When thrown away and burned, Bandages will cause the smoke released to produce harmful chemicals, such as dioxins, which can be used as plant poisons (herbicides). Improper disposal of disposable sanitary pads, such as disposal in rivers, can also affect the natural balance [12]. Sanitary pads are also a problem related to repeated monthly expenditures and the effect of pollutants on the environment [13]

Meanwhile, tampons are slightly better, because the percentage of plastic is only 6 percent. This plastic is found in straps and tampon applicators. The rest, made of wood pulp, cotton, rayon, and a combination of various materials at once. *Polypropylene* which is the main ingredient in making tampons is not environmentally friendly. There has not been any special handling of tampon and sanitary pads waste that have a bad impact on the environment [14]. Meanwhile, the benefits of menstrual cups in the environmental field lead to cost savings and reduction of waste, 1 menstrual cup can be used for up to 10 years [8].

Effectiveness

The results of research conducted by Linda Mason in 2015 found that according to respondents with the menstrual cup intervention group, menstrual cups rarely leak, do not fall, and after being inserted correctly, are more comfortable than sanitary pads. Bandages have the risk of shifting in the underwear so that there is a risk of leakage. The only advantage of sanitary napkins over menstrual cups is that they are easier to use concerning initial use [15].

In terms of absorption, tampons are superior to the other two menstrual sanitizers[16]. Tampons are considered an effective product because, besides being much smaller than ordinary sanitary napkins and able to hold blood the same as regular sanitary napkins, their use is more comfortable and can provide comfort on a busy day. use of tampons for sanitation devices Sanitary devices such as tampons are costly in Indonesia[6].

In terms of cost savings, menstrual cups are the right solution to apply. Menstrual cups are quite expensive at the time of initial purchase. However, they can last up to 10 years. Menstrual cups make a long-term investment by buying in advance and last longer than tampons and pads that have to be bought regularly. This can be applied to several people who fall into the middle to lower economic category in minimizing financial expenditures.

CONCLUSION AND SUGGESTION

The results of the analysis of 12 articles on the use of menstrual cups, tampon and menstrual pads with comparisons in terms of cleanliness, comfort, environmental impact and effectiveness showed that the menstrual cup was superior to the other 2 menstrual devices. Readers, especially women are expected to be able to properly choose menstrual sanitation devices such as tampons and menstrual cups as alternative products from the use of single-use sanitary napkins that suit their needs and comfort.

REFERENCES

1. Pudjiastuti RD. 3 Fase Penting Pada Wanita. Jakkarta: Kompas Gramedia. 2012;

2. Mohammed S, Emil Larsen-Reindorf R. Menstrual knowledge, sociocultural restrictions, and barriers to menstrual hygiene management in Ghana: Evidence from a multi-method survey among adolescent schoolgirls and schoolboys. PLoS ONE. 2020;15:1–19.

3. SPI. Sensus Penduduk Indonesia 2010. 2010.

4. Puspitasari PA. Mengolah Sampah Pembalut Sekali Pakai menjadi Pupuk Cair Sebagai Upaya Menjaga Kelestarian Lingkungan. 2019;

5. Puspita NFS. Dampak Sampah Pembalut Terhadap Lingkungan. FMIPAUNS. 2019;

6. Ekaputri GC. Produk Unmentionables Ditinjau dari Subjective Culture (Studi pada Produk Tampon di Jakarta). FISIP UI. 2014;

7. Martin C, Stuart N. Kenapa ya di Indonesia Tampon Kalah Populer dibanding Pembalut? Vice.com. 2017;

8. Beksinska ME, Smit J et al. Acceptability and Performance of the Menstrual Cup in South Africa: a randomized Crossover Trial Comparing the Menstrual Cup to Tampons or Sanitary Pads. journal of women's health. 2015;24:151–8.

9. Pane SR. Analisa Kandungan Klorin (CL2) Pada Pembalut Wanita Serta Tingkat Pengetahuan, Sikap, dan Keluhan Kesehatan yang Terjadi pada mahasiswa di fakultas Kesehatan Masyarakat USU tahun 2018. Universitas Sumatera Utara. 2018;

10. Taylor B. using tampons: facts and myths. Women's Health. 2017;

11. Parihar M. can menstrual cup be an alternative for better menstrual hygiene management? A review. 2019.

12. Puspita NFS. Dampak Sampah Pembalut Terhadap Lingkungan. UNS. 2019;

13. Mason L, Nyothach E, Van Eijk AM, Obor D, Alexander KT, Ngere I, et al. Comparing use and acceptability of menstrual cups and sanitary pads by schoolgirls in rural Western Kenya. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2019;8:2974.

14. Hait A, Powers SE. The value of reusable feminine hygiene products evaluated by comparative environmental life cycle assessment. Resources, Conservation and Recycling. Elsevier; 2019;150:104422.

15. Mason L, Laserson KF, Oruko K, Nyothach E, Alexander KT, Odhiambo FO, et al. Adolescent schoolgirls' experiences of menstrual cups and pads in rural western Kenya: A qualitative study. Waterlines. 2015;34:15–30.

16. Billon A, Gustin MP, Tristan A, Bénet T, Berthiller J, Gustave CA, et al. Association of characteristics of tampon use with menstrual toxic shock syndrome in France. EClinicalMedicine. 2020;21.

Picture 1. *Diagram Flow Literature Review based on PRISMA 2009 (Polit and Beck, 2013)*

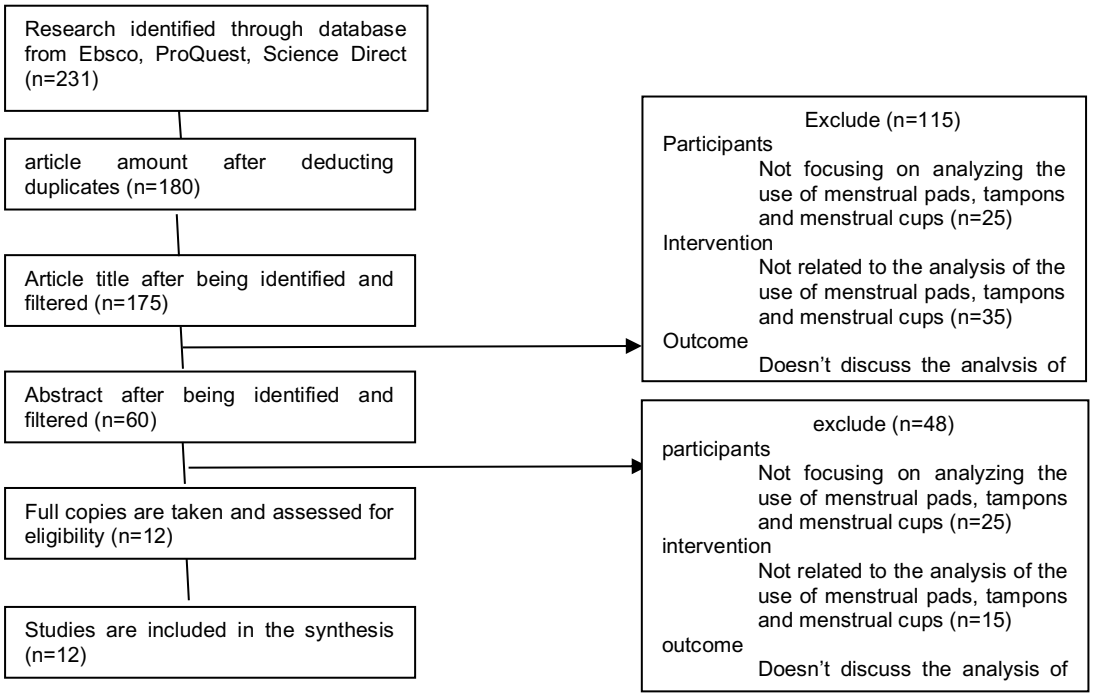

Table 1. list of search results articles

Title	Study design, samples, variables, instruments, analysi	The outcome of analysis factors
Acceptability and performance the menstrual cup in Sou Africa: a randomized crossov trial comparing the menstrual cu to tampons or sanitary pa (2015)	D: a randomized controlled trial S: simple random sampling V: performance, acceptance, and safety of sanitary napkins, tampons, and menstrual cups I: questionnaire and observation sheet A: analysis descriptive statistics using the Pearson chi-square tes	Of the 124 women assessed, use of th Menstrual Cup from 85% increased to 90 of the participants said it was very likely continue using it. The data clearly show th experience using Menstrual Cup acros three cycles of use increased use, with eas of insertion increasing from 38% of wome at visit 1 to 96% at visit 3. At visit 1, mo than half (58%) of the women reported th initial difficulty with insertion reduced wi use. Likewise, the ease of removal als increases over time, whereas the problen associated with the discomfort with th Menstrual Cup at insertion decrease.
Comparing use and acceptabil of menstrual cups and sanita pads by schoolgirls in ru western Kenya (2019)	D: a randomized controlled trial S: Simple random sampling V: The use and acceptance of sanitary napkins and menstrual cups from factors of safety, the potential for infection, comfort, and pain I: observation questionnaire A: Pearson chi-square test	One hundred ninety-five participan received menstrual cups, and 2 respondents received sanitary napkins. Th mean age of the respondents was 14 years, with average menstruation of 3 days per month. Menstrual cup use wa 39% at month 1, rising to 80% at month (linear trend p <0.001). The use of sanita napkins increased from 85% to 92% (line trend p = 0.15). Menstrual cup acceptan data showed girls had problems with initi use of menstrual cups, but reports difficulties with insertion, removal, ar comfort diminished.
Impact of Currently Market Tampons and Menstrual Cups Staphylococcus aureus Grow	D: quasi-experimental S: total sampling	It was found that tampons reduced th growth of S.aureus and TSST-1 produc (Toxin Shock Syndrome Toxin-1) wi differences based on the brand ar

and Toxic Shock Syndron Toxin 1 Production in vitro (202	V: S. Aureus growth and TS (Toxic Shock Syndrom production between intravagin devices, namely tampons ar menstrual cups I: observation A: Spearman correlation	composition and levels of S.aureus. Whi the Menstrual cup, it is known that th growth rate of S.aureus is higher than th of tampons, possibly due to additional a entering the cup with differences based c cup composition and size.
Menstrual cups and sanita pads to reduce school attritio and sexually transmitted ar reproductive tract infections: cluster-randomized controll feasibility study in rural weste Kenya (2016)	D: Randomized Controlled trial S: simple random sampling V: the use of Menstrual Cups an pads is associated with the risk c STIs I: observation and examination sheets per semester A: multivariate long-binomial Generalized Estimating Equation (GEE)	The prevalence of STIs (Sexua Transmitted Infections) was found, name in the Menstrual Cup 4.2%, sanitary napki 4.5%. The prevalence of vaginosis bacter in the Menstrual Cup is 12.9% while sanitary napkins is 20.3%
Adolescent schoolgi experiences of menstrual cu and pads in rural western Keny a qualitative study (2015)	D: Randomized controlled trial S: simple random sampling V: check the acceptance, use, ar safety of the Menstrual Cup and sanitary napkins I: observation sheet and FGD (Focus Group Discussions) A: The results of the FGD were processed using thematic analys	The study results revealed that scho students preferred to use the Menstrual Cu instead of sanitary napkins. Although at firs some participants reported difficulty wearir the Menstrual Cup, pain with use. Howeve they kept trying because their other frien were successful in using the Menstrual Cu and they were helped by further instructio on peer, nurse/teacher fitting.
The cost-Benefit and cc Effectiveness of providi menstrual cups and sanita pads to schoolgirls in rural Ken (2020)	D: Randomized Controlled trial S: simple random sampling V: comparing the cost expenditure as well as th effectiveness of sanitary napkir and MC I: observation A: WTP approach and H approach	The cost of providing menstrual cups much lower than the cost of providir sanitary napkins. The health impact of th menstrual cup program was that th reduction in STI and RTI was mo significant than that of the sanitary us program.
The use of sanitary pads ar menstrual cups and their impa on the environment (2020)	D: conesa methodology S: total sampling V: analysis of sanitary napkin disposal by using a cup that has an impact on the environment I: risk assessment matrix and environmental impact importance A: Life Cycle Analysis	The use of sanitary napkins gave a negati impact, with a level of importanc Environmental in Moderate Impact (EI evidence rated B, and Meaning Intermediate Environmental Impact (ES On the other hand, menstrual cup use had positive impact, with a degree of importanc Environmental (EII) Moderate +, evidenc value C, and Level of Significance of Impa Environment (ESI) Medium.
The value of reusable femini hygiene products evaluated by comparative environmental l cycle assessment (2019)	D: a comparative life cyc assessment (LCA) S: total sampling V: comparing the effect of sanita napkins, tampons, and menstru cups on the impact on waste I: observation	Using a comparative life cycle assessmer the impact is relative to three menstru products determined across eight impa categories. Disposable tampons and pa have a much more significant environment impact in each category than does menstrual cup reusable. The pads have normalized score higher than the two singl use options, even though the quantitati

	A: Gabi LCA software	difference is the same. For tampon removing the applicator åfrom the produ reduced the overall score by 14.5%. Reusable menstrual cups for less than year, 1.5% for the impact on th environment, and is an alternative produ that is only about 10% of the expenditu cost.
Tampon use, environmen chemicals, and oxidative stre in the BioCycle study (2019)	D: BioCycle study/cohort study S: simple random sampling V: researching potential associations between tampon use and metal concentrations, and biomarkers c inflammation and oxidative stress among healthy women I: questionnaire and observation sheet A: descriptive statistics with univariate analysis	Mean mercury levels were not significant higher for tampon users compared to no tampon users (exp (β) = 1.25, 95% CI 0.93, 1.68). in this study, there was not r evidence of an association between tampo use and inflammatory biomarkers. Lev higher isoprostane, a marker of oxidativ stress, among tampon users compared non-tampon users (eg Exp. (β) = 1.05, 95 CI =0.96, 1.16, for mean isoprostane durir the menstrual week)
Examining the safety menstrual cups among ru primary school girls in weste Kenya: observational studi nested in a randomize controlled feasibility study (201	D: Randomized Controlled Trial S: simple random sampling V: comparing the safety of usir menstrual cups and sanita napkins among school students I: observation A: The prevalence values we analyzed using SPSS versio 21.0. Means and medians we calculated with the SD and IQR a appropriate. Significant difference in prevalence and linear trend were tested using χ 2.	Among the 604 eligible girls who we tested, no side effects or TSS (Toxic Sho Syndrome) were detected during a mean 10.9 months of follow-up. S. aureu prevalence was 10.8%, with no significa difference during the intervention tim between groups. Of the 65 who teste positive for S.aureus on the first test, 49 gi retested and 10 (20.4%) remained positiv Of these, two (20%) samples of the isolate tested positive for the toxin shock syndron toxin-1; both girls were given sanita napkins and were clinically healthy.
Association of characteristics tampon use with menstrual tox shock syndrome in Franc (2020)	D: a case-control study S: simple random sampling V: comparing the case group and the control group to determine th impact of using tampons for more than 6 hours on the onset of MTSS (Menstrual Toxic Shock Syndrome) I: questionnaire and observation A: Wilcoxon's non-parametric tes and fisher's test	Compared with controls, women diagnose with MTSS (Menstrual Toxic Sho Syndrome) more frequently reporte maximum tampon use of> 6 hours (62% v 41%; P = 0.02), overnight tampon use (77 vs. 54%; P = 0.006), and neither read n followed tampon instructions in the case reading (65% vs 42%; P = 0.006). univariate analysis, the risk of MTSS wa twofold higher with tampon use for> consecutive hours (odds ratio, 2.3 [95% C 1.2 4.5]), and threefold higher with use of tampon. tampons during sleep for> 8 hou (odds ratio, 3.2 [95% CI, 1.4 7.7]). multivariate logistic regression analysi only maximum tampon use was> 6 hou (odds ratio, 2.03 [95% CI, 1.04 3.98]), ar neither read nor followed tampo instructions in case of readings (odds rati 2 , 25 [95% CI, 1.15 4,
Use of menstrual cups amo school girls: longitudin observations nested in randomized controlled feasibil	D: Randomized controlled trial S: simple random sampling	Among the 267 girls in 10 schools allocate to the menstrual cup study, 60 we excluded because they did not meet th criteria eligibility for research, and 7 girls d

study in rural western Ken (2018)	V: the use of the Menstrual Cu on schoolgirls in Kenya by lookir at the feasibility and safety of usir the Menstrual Cup to reduc friction and reproductive sexu infection	not want to participate (after they receive the Menstrual Cup) Among the 207 girls wh participated who received the Menstru Cup, 192 presented their menstrual cups f examination appropriateness. The majori of girls with an average age 14.6 years.
	I: questionnaire and observatic sheet	Use verbally reported menstrual cu increased from 84% in the first 3 months = 143) to 96% after 9 months (n = 74).
	A: Pearson's χ 2 test and Fishe Exact test	