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Factors related to the use of internet in Bali by women as a source of information about pregnancy, childbirth, and baby care: a cross-sectional study

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ABSTRACT

Purpose: This study aims to identify the relationship between sociodemographic and obstetric factors with the use of the internet by women as a source of information about pregnancy, childbirth, and baby care.

Method: This cross-sectional study involved 185 women who had babies aged 0-3 months. Data were collected in August and September 2018. Data were collected by interviews using questionnaires. Data analysis was conducted by chi-square and logistic regression

Results: The age factor (p = 0.255), education (p = 0.071), occupation (p = 0.100), income (p = 0.077) and parity (p = 0.380) were not related to the use of the internet. The factor of service provider is significantly related to internet usage (p = 0.031).

Conclusion: The use of the internet by women in Bali to search information about pregnancy, childbirth, and baby care is not related to most sociodemographic and obstetric characteristics. The results of this study could be taken into consideration by health practitioners to create innovative programs in the field of maternal and child health services.

Keywords: internet use, women, pregnancy, childbirth, Bali.

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INTRODUCTION

The internet exists as a health information resource that is very popular today.[1,2] The use of the internet as a health information resource by women is increasing, especially during important periods of their lives.[3] Pregnancy, childbirth and having a baby are very important periods for women.[4] Physical and psychological changes that occurred in this period have caused anxiety and many questions for women.[2] The internet provides information about the process of pregnancy, childbirth and baby care or early parenting that can be accessed at any time. [5] Studies from several countries show that almost all women use the internet as health information resources.[6–8]

Women search for information through the internet for various reasons. The results of a multi-center study in Italy show that the majority of people search for information via the internet because they can get information faster and more than the conventional consultation model.[9] The results of a survey in the UK in 2011 found that people searched for information on the internet to seek second opinions so as to increase their confidence and understanding or because there were obstacles to consultations with the conventional method.[10] In a study conducted by Lagan et al., women search for information via the internet because health professionals do not provide adequate health information according to what they actually need.[11] The internet as a source of information, and as a means to help them overcome doubts, and to navigate decisions related to pregnancy, childbirth and baby care.[11-13]

The type of information accessed by women and how to use the internet are influenced by various factors. Socio-demographic factors, obstetric history and culture influence the way internet is used and the type of information accessed.[8,10,14] However, different findings were shown by the study of Scaioli et al. that there is no difference between socio-demographic characteristics and internet use. Information that is widely accessed by pregnant women is about nutrition, complications, and breastfeeding. Other information that is also often accessed is about childbirth or labor preparation, labor pain management, infant growth, and physical activities.

In Indonesia, pregnant women obtain information about pregnancy, childbirth, and baby care through an individual face-to-face process with health workers. In addition there is a class program for pregnant women, but it is less desirable by pregnant women because most do not have time to attend the program. The use of the internet as a source of health information by pregnant women in Indonesia is quite high. A report from Google Indonesia shows that the search for information about pregnancy is the highest (52%), more than the search for baby care and childbirth.[15] There

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are no research results on the use of the internet by women as a source of health information in Indonesia. Information about various factors related to internet use and the type of information sought is important to be researched so that it can be used as a basis for designing effective programs. The study was conducted in the city of Denpasar, Bali, Indonesia. The research questions are: What are the characteristics of women's sociodemography and obstetrics in the city of Denpasar, what sources of health information are used, what information is sought through the internet and factors that influence the use of the internet by women in the city of Denpasar, Bali, Indonesia .

METHOD

Cross-sectional study of 185 women who have babies aged 0-3 months. Inclusion criteria in this study are women who have babies aged 0-3 months, at least a junior high school graduate, and are willing to be interviewed to completion.

The research location was in Denpasar, Bali, Indonesia, from August to November 2018. Denpasar is the capital of the Province of Bali, Indonesia. Denpasar City consists of four sub-districts. The research locations were selected in several Community Health Centers which were spread in all districts in Denpasar City. The community health center is an institution in the community that has a certain service area. Health workers on duty are doctors, midwives, nurses, analysts, public health experts. One of the scope of services provided is maternal and child health, antenatal care, childbirth, infants, toddlers, reproductive health, family planning and adolescents. There are 11 Community Health Centers spread in the four sub-districts. One Community Health Center was randomly selected in each sub-district. All respondents who met the inclusion criteria were selected as samples.

The independent variables in this study are sociodemographic and obstetric characteristics consisting of: age, occupation, education, income, parity and pregnancy service workers. The dependent variable is internet usage. The use of the internet is categorized into two, namely: using the internet as a source of information and not using the internet as a source of information.

The data collection process was assisted by four enumerators for two months. Enumerators are tasked with approaching mothers who have babies 0-3 months of age to be willing to become research respondents. Women who were willing to be respondents were directly interviewed by enumerators using the data collection forms that had been prepared.

The analysis process consists of bivariate and multivariate analytic descriptive analysis. Descriptive analysis to analyze socio-demographic and obstetric characteristics data, sources of information and topics of information sought on the internet. Analysis of factors related to internet use was by using the Ci Square bivariate test. Variables with p values <0.25 continued to multivariate analysis of binary logistic regression in the backward step-wise method.

Table 1 Socio-demographic and obstetric characteristics (*n* = 185)

Variable Category	Frequency	Proportion (%)
Age		
≤ 35 years old	174	94.1
>35 years old	11	5.9
Education		
Higher education	35	19.0
Secondary and basic education	150	81.0
Occupation		
Working	65	35.1
Not working	120	64.9
Income of respondent		
≥ Regional minimum wage	140	75.7
< Regional minimum wage	45	24.3
Parity		
Nulliparous	85	45.9
Multipara	100	54.1
Pregnant health care providers		
Obstetricians	74	40.0
Midwives	111	60.0

RESULTS

This study involved 185 women as respondents in Denpasar Bali Health Center. The socio-demographic and obstetric characteristics of the respondents are summarized in table 1. Most (94.1) respondents aged ≤ 35 years, most (81.0) respondents had secondary and basic education, more than half of respondents did not work, 54% multiparous and 60% of paramedics in pregnancy services were obstetricians.

The sources of information used by respondents are described in table 2. The most widely used information sources by women to find information about pregnancy, childbirth and baby care is via the internet (53.5%), and the least used information source is that of a friend (1%).

The information topics sought by women related to pregnancy, childbirth and baby care via the internet are described in table 3. The information topic

Table 2 Source of health information used by women in the city of Denpasar, Bali

	Resources/sources of information		The most proportion used source of information	
Sources of information	**Frequency**	**Proportion (%)**	**Frequency**	**Proportion (%)**
Midwives	127	68.6	44	23.8
Obstetricians	81	50.9	10	5.4
Maternal and Child Health Handbook	118	63.7	21	11.3
Internet	123	66.4	99	53.5
Family	44	23.8	9	4.9
Friends	19	10.3	2	1.0
Total			185	100

Table 3 Health information topics searched on the internet during pregnancy and after childbirth (*n* = 185)

Health information topics sought by women	Frequency	Proportion (%)
Complaints during pregnancy	77	41.6
Development of the fetus in the womb	79	42.7
Signs or symptoms of labor/childbirth	57	30.8
Nutrition for pregnant women	95	51.3
The childbirth/labor process	73	39.4
Labor preparation	45	24.3
Baby care	24	12.7

Table 4 Bivariate analysis of factors related to internet use (*n* =185)

	Internet use				
Variables	**Yes n (%)**	**No n (%)**	**COR**	**95%CI**	**p-value**
Age					
≤ 35 years old	94 (95.9)	80 (92)			
>35 years old	4 (4.1)	7 (8)	2.1	0.581-7.279	0.255
Education					
Higher education	27 (27.6)	8 (9.2)			
Secondary and basic education	71 (72.4)	79 (90.8)	3.7	1.608-8.800	0.001
Occupation					
Working	44 (44.9)	21 (24.1)	2.5	1.361-4.818	0.003
Not working	54 (55.1)	66 (75.9)			
Income of respondent					
≥ Regional minimum wage	82 (83.7)	58 (66.7)			
< Regional minimum wage	16 (16.3)	29 (33.3)	2.5	1.276-5.114	0.007
Health care providers					
Obstetricians	50 (51.1)	24(27.6)			
Midwives	48 (48.9)	63 (72.4)	2.7	1.479-5.056	0.001
Parity					
Nulliparous	48 (49.0)	37 (42.5)			
Multipara	50 (51.0)	50 (57.5)	1.2	0.276-2.319	0.380

COR : Crude Odds Ratio, CI: confidence interval

Table 5 Multivariate analysis of factors related to internet use (n=185)

Variables	AOR	95 % *CI*	p-value
Education			
Women's education level (Higher education)	2.353	0.928-5.966	0.071
Occupation			
Working women	1.789	0.895-3.578	0.100
Income			
Income ≥ Regional Minimum Wage	1.959	0.929-4.132	0.077
Health care providers			
Obstetricians	2.074	1.070-4.020	0.031

AOR: Adjusted Odd Ratio, CI: confidence interval

most frequently sought by women on the internet is about food for pregnant women (51.3%). Other topics sought were about the development of the baby in the womb of 42%, complaints during pregnancy of 41.6%, childbirth process of 39.4%, symptoms of childbirth of 30.8%, childbirth preparation of 24.3% and baby care of 12.7%.

Bivariate analysis of factors related to women's use of the internet to find information about pregnancy, childbirth and baby care is described in table 4. The results of the bivariate analysis found that age was not related to internet use (p = 0.255), while education, employment, income, and service provider factors are significantly related to internet use. Educational factors (p = 0.001), employment (p = 0.003), income (p = 0.007), and health service providers (p = 0.001). The parity factor is not significantly related to internet usage.

Variables with a value of p <0.25 in the bivariate analysis were included in the multivariate analysis. Multiariate analysis of factors related to the use of the internet to find information about pregnancy, childbirth and baby care is described in table 5. Multivariate test results found that education, employment and income factors are not related to internet use. Women's education level (higher education) (AOR = 2.3; 95% CI: 0.928-5.966), working women (AOR = 1.7; 95% CI: 0.895-3.578), and Regional Minimum Wage Income (AOR) = 1.9; 95% CI: 0.929-4.132). Factors related to internet use are health care providers by obstetricians (AOR = 2,074; 95% CI: 1,070-4,020).

DISCUSSION

Various health information during the pregnancy period and after childbirth is needed by women.[16-19] Women seek health information from various sources. The results of this research conducted in Denpasar, Bali show that the internet is the most widely used source of information by women. In addition to searching for information on the internet, women also seek information from various sources. The sources of information are health workers, friends, family or from books. The reason they are looking for information from the internet is to complete the information, ensure information has been obtained previously and because it can be accessed at any time. This finding is in line with a study conducted by Lagan, et al.[20] In addition, women use the internet to increase their confidence in making decisions.[21] Through the internet, they can get information quickly and can reduce their anxiety.[22] Through the internet they also find the information needed Information obtained through the internet helps women carry out their roles as mothers.[20] Most of the women stated that the information found was discussed again with their health workers because it was incomplete or incorrect.[20]

In this study, the most accessible information topic is nutrition of pregnant women. Other topics that are also sought after are fetal development in the womb, complaints during pregnancy and childbirth, labor preparation and baby care. Most respondents stated that explanations from health workers or other sources were incomplete, so they searched from the internet. This study is in line with research conducted in Scotland, Switzerland and the Netherlands that pregnant women are very interested in finding information about nutrition and fetal development.[8,23,24] Other research also found that the most common information sought by women was about fetal development, nutrition, health complications, and breastfeeding.[25,26]

This study analyzes factors related to internet usage. In the bivariate analysis factors of education, employment, income and service providers are related to internet use, but parity and age factors are not related. However, in logistic regression analysis, the factors of work, education, and income of the respondents were not related to internet use. Data shows that internet use is regardless of age, parity,

employment, education and income. This finding is in line with research by Slomian et al., internet usage is regardless of age and socioeconomic status.[20] There is no difference in the use of the internet in terms of education levels is also found in the study Slomian et al.[20] The results of studies in Italian women found that socio-demographic factors did not affect information search on the internet.[26] In this study, service provider factors are related to internet usage. Health workers who provide pregnancy services in Denpasar Bali are midwives and obstetricians. The results showed that women who were given services by obstetricians used the internet more. Obstetricians work in referral/tertiary health agencies, serving referral and normal cases, equipped with ultrasound services so that the costs are more expensive. Midwives are in charge of serving in primary health agencies, serving normal pregnant women at lower costs. The difference in the place of service and authority of the two professions, of course, affects the characteristics of the women served.

The presence of the internet creates opportunities and challenges for health practitioners. The integration of the internet with service programs can be a new innovation to improve the quality of health services and enhance the active participation of clients. The research results can be used as material for designing internet-based service programs.

CONFLICT OF INTEREST

The author has no interests related to the material presented in this paper.

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ETHICAL ASPECT

All respondents in this study had signed informed consent. This study has received a statement of Ethical Worthiness from the Research Ethics Commission of the Faculty of Medicine, Udayana University/Sanglah Central General Hospital, Denpasar.

REFERENCES

1. Gao L ling, Larsson M, Luo S yuan. Internet use by Chinese women seeking pregnancy-related information. Midwifery. 2013;29(7):730–5.
2. Crum J. The Whole Nine Months and Then Some: Pregnancy, Childbirth, and Early Parenting Resources on the Internet. Heal Care Internet. 2000;4(2–3):99–111.
3. Lagan BM, Sinclair M, Kernohan WG. No TitleA web-based survey of midwives' perceptions of women using the Internet in pregnancy: a global phenomenon. Midwifery. 2011;27:273–81.
4. Grimes HA, Forster DA, Newton MS. Sources of information used by women during pregnancy to meet their information needs. Midwifery. 2014;30(1):e26–33.
5. Bjelke M, Martinsson AK, Lendahls L, Oscarsson M. Using the Internet as a source of information during pregnancy — A descriptive cross-sectional study in Sweden. Midwifery. 2016;40:187–91.
6. Scaioli G, Bert F, Galis V, Brusaferro S, De Vito E, La Torre G, et al. Pregnancy and internet: Sociodemographic and geographic differences in e-health practice. Results from an Italian multicenter study. Public Health. 2015;129(9):1258–66.
7. Bert F. Gualano MR, Brusaferro SE. Pregnancy e-health : a multicenter Italian cross-sectional study on Internet use and decision-making among pregnant women. JournalofEpidemiologyandCommunityHealth. 2013;67:1013–1018.
8. Kavlak O, Unsa lAtan S, Gulec D, Özturk R, Atay N. Pregnant women's use of the Internet in relation to their pregnancy in Izmir. Turkey Informatics Heal Soc Care. 2012;37:253–263.
9. Siliquini R, Ceruti E, Lovato F, Bert S, Bruno, De Vito E, et al. Surfing the internet for health information: an italian survey on use and population choices. BMC Med Inf Decis Mak. 2011;11(21):1-8.
10. Powell J, Inglis N, Ronnie J, Large S. The characteristics and motivations of online health information seekers: crosssectional survey and qualitative interview study. J Med Internet. 2011;13(1):e20.
11. Lagan BM, Sinclair M, Kernohan WG. What Is the Impact of the Internet on Decision-Making in Pregnancy? A Global Study. Birth. 2011;38(4):336–45.
12. Romano A. A Changing Landscape: Implications of Pregnant Women's Internet Use for Childbirth Educators. J Perinat Educ. 2007;16(4):18–24.
13. Song F, West J, Lundy L, Smith-Dahmen N. Women, Pregnancy, and Health Information Online: The Making of Informed Patients and Ideal Mothers. Gend Soc. 2012;26(5):773–98.
14. Ybarra M, Suman M. Reason, assessment and action taken: sex and age differences in uses of internet health information. Heal Educ Res. 2008;23(3):512e21.
15. Putri A. Internet use among pregnant women, what are they seeking?. Bintang News Update; 2018.
16. Wallwiener S, Müller M, Doster, A. et al. Pregnancy eHealth and mHealth: user proportions and characteristics of pregnant women using web-based information sourcesa cross-sectional study. Arch Gynecol Obstet. 2016;294(5):937–944.
17. Hameen-Anttila K, Kokki E, Lupattelli, A. et al. Factors associated with the need for information about medicines among pregnant women - A multinational internet-based survey. Res Soc Adm Pharm. 2014;11(2):297–302.
18. Burton -Jeangros C, Hammer R. Information seeking on the internet: what information are pregnant women seeking. Rev Médicale Suissee. 2013;9:895–897.
19. Lagan B., Sinclair M, Kernohan W. Internet use in pregnancy informs women's decision making: a web-based survey. Birth. 2010;37:106–115.
20. Slomian J, Bruyère O, Reginster JY, Emonts P. The internet as a source of information used by women after childbirth to meet their need for information: A web-based survey. Midwifery. 2017;48:46–52.
21. Huberty J, Dinkel D, Beets MW, Coleman J. Describing the use of the Internet for health,physical activity,and nutrition information in pregnant women. Matern Child Health J. 2013;17:1363–1372.

22. De Santis M, De Luca C, Quattrocchi T, Visconti D, Cesari E, I M, et al. Use of the Internet by women seeking information about potentially teratogenic agents. Eur J Obs Gynecol Reprod Biol. 2010;151(2):154–7.
23. Larsson MA descriptive study of the use of the Internet by women seeking pregnancy-related information. Midwifery. 2009;25(1):14–20.
24. Luyben A, Fleming V. Women's needs from antenatal care in three European countries. Midwifery. 2005;21(3):212–23.
25. Lima-Pereira P, Bermúdez, Tamayo C, Jasienska G. Use of the Internet asa source of health information among st participants of antenatal classes. J Clin. 2011;21,322–330.
26. Scaioli G, Bert F, Galis V, Etal. Pregnancy and Internet :Sociodemographic and geographic differences in e-health practice. Results from an Italian multi- center study. Public Health. 2015;129:1–9.