



Fertility education on Instagram: advertisements vs. educational content analysis for posts in Bahasa (Indonesian language)

Achmad K Harzif, MD, PhD^{a,b,*}, Berli Kusuma, MD^c, Nafi'atul Ummah, MD^b, Aisyah R Puspawardani, MD^b, Putri Nurbaeti, MD^b, Budi Wiweko, MD, PhD^{a,b}

Background: As one of Indonesia's major social media platforms, Instagram provides abundant information, including fertility topics. However, fertility information in Bahasa (Indonesian language) had never been mapped before. This study aims to determine the prevalence, authorship, and types of fertility-related information in Bahasa shared on Instagram using hashtag and content analysis. Additional outcomes included a comparison of post content stratified by author type (healthcare providers vs. non-healthcare providers).

Materials and methods: Five hashtags comprising fertility terms in Bahasa (Indonesian language) were derived. Content analysis was performed on the top 100 posts for each hashtag to determine the authorship and content type. The contents posted by healthcare providers were analyzed and compared to those published by non-healthcare providers.

Results: Our search yielded 3 883 000 posts for the five most popular hashtags. The three most popular hashtags were 'promil', 'program hamil' and 'bayitabung'. Authorship of the top posts for each hashtag was predominantly by for-profit healthcare institutions (27.6%), followed by commercial alternative/herbal medicine (20.2%), patients (20%), physicians (11.8%), allied health professionals (3.2%), professional societies (0.8%), and others (16.4%). Of these posts, 35.4% were advertisements, 28% were related to patient experience, and 18% were educational. Healthcare provider groups were more likely to author educational posts than advertisements, while non-healthcare providers were more likely to post content for commercial purposes ($P < 0.001$).

Conclusion: Fertility-related posts were dominated by for-profit healthcare institutions and alternative/herbal medicines for commercial purposes. The physician group authored more of the educational content. There is plenty of room for optimal utilization of social platforms as educational media.

Keywords: content analysis, fertility education, infertility, instagram, knowledge

Introduction

People around the globe are now connected via social media. With the advancement of technology and Internet access, social media use is prevalent. The previous pandemic may have contributed to the increase in Internet users worldwide. In Indonesia,

^aReproductive Immunoendocrinology Division, Department of Obstetrics and Gynecology, Faculty of Medicine Universitas Indonesia, Dr. Cipto Mangunkusumo General Hospital, ^bHuman Reproduction, Infertility, and Family Planning Research Center, Indonesian Medical Education and Research Institute and ^cDepartment of Obstetrics and Gynecology, Faculty of Medicine Universitas Indonesia, Jakarta, Indonesia

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*Corresponding author. Address: Reproductive Immunoendocrinology Division, Department of Obstetrics and Gynecology, Faculty of Medicine Universitas Indonesia, Dr. Cipto Mangunkusumo General Hospital Pangeran Diponegoro Street No.71, Kenari, Senen, Central Jakarta, Jakarta 10430, Indonesia. E-mail: kemal.achmad@gmail.com (A. K. Harzif).

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HIGHLIGHTS

- There are many fertility content on Instagram using Bahasa.
- Fertility posts in Bahasa are dominated by for-profit healthcare institutions, followed by commercial alternative/herbal medicines, patients, physicians, allied health professionals, professional societies, and others.
- Only 18% of the total analyzed content was categorized as educational. Instagram as a social media platform is yet to be used optimally for educational purposes in Indonesia.

over 212 million people (77% of the population) use the Internet. At least 167 million (60.4% of the total population) actively use social media, with an average online time of more than seven hours daily^[1]. The main reason people use the Internet is to find information. Some popular social media platforms such as Instagram, YouTube, and TikTok provide nearly all the information needed. Up to 42.1% of Internet users stated that the main reason for going online is researching health issues and healthcare products^[1–3].

The median age of the Indonesian population is 29.8 years, which means that most Indonesians are now in their reproductive age. Thus, the need for fertility information becomes more essential. Social media is increasingly becoming a health resource

for people to obtain fertility information^{1,4}. Few authors have attempted to describe fertility information on social media. Fertility information posts in English were mapped, showing the dominance of the information posted by patients. Other authors have found that hashtags may guide users to find fertility information. While those studies dealt with information written in English, fertility information posted in non-English languages has not been explored. Therefore, this study aims to determine the prevalence, authorship, and types of fertility information in Bahasa on Instagram and to compare the content of posts authored by physicians versus non-physicians^{5,6}.

Methods

Study design

This study is a cross-sectional observational study using data collected on Instagram. The data-searching method using hashtags was adopted and modified from previous studies by Peyser and colleagues, Park and colleagues, and Qin and colleagues^{6–8}. This study is reported in line with the STROCSS criteria⁹.

Data collection

A list of hashtags was derived from those used in posts by verified accounts of certified REI (Reproductive endocrinology and infertility) or reproductive healthcare facilities. These hashtags included #infertilitas, #programhamil, #promil, #inseminasi, #PejuangGarisDua, #BayiTabung, and #bayitabungindonesia. The five most prevalent hashtags that appeared from the search menu on Instagram in November 2023 were selected. One hundred top searches yielded by each hashtag were then described for authorship and types of content. All types of posts, either images or videos, were included. Authorship was specified by the information provided in the account profile or associated website. The authors were grouped into the following categories: physicians, allied health professionals, professional societies, for-profit healthcare institutions, commercial alternative/herbal medicine, or patients. The content of fertility-associated posts is then identified as follows: educational, patient experiences, advertisement, or others.

Data management

Collected data were analyzed using IBM Statistical Package for Social Science (SPSS). Characteristics of Instagram posts were analyzed descriptively. Categorical data of authorship and types of content were analyzed using the χ^2 test. This study used a 5% error bound and a 95% CI limit.

Ethical consideration

This study was approved by the Research Ethics Committee of the Faculty of Medicine, Universitas Indonesia, in November 2023, with ethical clearance number KET-1640/UN2.F1/ETIK/PPM.00.02/2023.

Results

Our search yielded 4 005 400 posts for seven hashtags. The five most popular hashtags were ‘#promil’, ‘#programhamil’, ‘#bayitabung’, ‘#inseminasi’, and ‘#infertilitas’ (Table 1).

Table 1

Most popular fertility-related hashtag in Bahasa.

Hashtags	N
#promil	1 800 000
#programhamil	1 200 000
#bayitabung	428 000
#inseminasi	321 000
#infertilitas	134 000
#PejuangGarisDua	107 000
#bayitabungindonesia	15 400

The top five most popular hashtags were chosen from the search menu on Instagram. One hundred top posts of each hashtag then underwent final analysis for authorship and type of content. The authorships of the top posts for each hashtag ($N = 500$) were as follows: for-profit healthcare institutions (27.6%), commercial alternative/herbal medicine (20.2%), patients (20%), physicians (11.8%), allied health professionals (3.2%), professional societies (0.8%), and others (16.4%). Of these posts, 35.4% were advertisements, 28% were related to patient experience, and 18% were educational. Healthcare provider groups were more likely to author educational posts than advertisements, while non-healthcare providers were more likely to post content for commercial purposes ($P < 0.001$) (Table 2).

Discussion

To our knowledge, this is the first study to map fertility-related information in Bahasa on Instagram. Our study and previous studies have provided much information regarding fertility on Instagram, both in English and Bahasa. Surprisingly, there were more fertility-related posts in Bahasa ($N = 4\ 005\ 400$; seven hashtags) than in other parts of the world using English ($N = 3\ 393\ 636$; 10 hashtags)⁶.

Authorship

This study showed that for-profit healthcare organizations dominate fertility-related posts on Instagram, followed by commercial alternative/herbal medicine and patients. This result portrayed the use of social media by healthcare organizations to achieve better engagement with their patients. Some studies have described the reason why healthcare organizations use social media. It is an online platform enabling patient education, health promotions, community outreach, public relations, and crisis communication¹⁰. Others said social media encourages healthcare personnel to utilize social media platforms as a public space to share their expertise in an engaging and empowering manner¹¹. Our result was different from that of a study by Peyser and colleagues. Researchers have found that for-profit

Table 2

Association between authorship and type of content

Authorship	Type of content, N (%)		P
	Educational	Advertisement	
Physician	86 (68.8)	39 (31.2)	< 0,001
Non-physician	4 (2.8)	138 (97.2)	< 0,001

healthcare organizations authored only 6% of infertility-related posts in English on Instagram^[6]. It seems that hospital executives do not widely use social media in English-speaking countries. Richter *et al*^[12], described how hospitals used Facebook for consumer education, staff acknowledgement, and sharing news of the organization's achievements but were underutilized to get better engagement with their patients.

Indonesia, with 77% of the total 275 million population using the Internet, has more than 167 million people (60.4% of the total population) actively using social media with an average online time of up to more than 7 h a day. This number represents a significant market target for hospitals as for-profit organizations to increase revenue using social media effectively^[12]. This big social media market not only attracts hospitals and fertility centres but also complementary and alternative medicine practitioners to attract subfertility patients. A balanced proportion of authors (27.6% for-profit healthcare organizations, commercial alternative/herbal medicine (20.2%), and patients (20%)) indicates that Kleinman's tripartite theory may be relevant in Indonesia with a multicultural population. This theory states that for each culture, the healthcare system comprises three sectors: popular, professional, and folk^[13]. The popular sector is defined as a general, non-expert population in which illness is defined and healthcare activities begin. Referrals from family or friends, including online information searching, belong to this sector^[13,14]. Two other sectors are the professional sector, which we know as scientific modern medicine, and the folk sector, known as traditional medicine, which may differ for any culture^[13].

Another interesting finding was the low proportion of posts authored by patients. Previous studies have shown a higher proportion of posts authored by patients on health topics. Braunberger *et al*^[15], found that 73% of dermatology-related content was posted by patients. Dzienny *et al*^[16], in the urogynecology field found that posts by patients on social media, Twitter, and Instagram were up to 40%. For the fertility topics, Peyser *et al*^[6], demonstrated that 60% of posts on Instagram are authored by patients. Small amounts of posts authored by patients in Indonesia may be due to infertility being a sensitive topic to discuss in public. Childless couples often encounter social problems and negative stigma in society^[17].

Among the 500 posts analyzed in this study, only 11.8% were authored by physicians. This number is higher than that of a 2021 study in the US, where individual physicians authored 10% of the posts. This increasing number of physicians using Instagram has shown that Instagram is an open room for discussion and for physicians to educate patients. Physicians seem more open to acknowledging the role of social media in increasing patients' literacy^[4]. Doctor-patient communication has become a part of patient care, synergically purposed for better health outcomes. Social media also provides room for patient support groups and is particularly advantageous for those with mobility limitations. Many studies have shown the use of social media in the management of health problems such as chronic rheumatologic, orthopaedic, and neurologic conditions. Through social media, patients may receive and give information and support to each other, which improves their sense of community, self-management, patient empowerment, and health literacy^[4,18,19].

Content analysis

Of the 500 posts in Bahasa that we analyzed, most of them (35.4%) were advertisements. Instagram appears to have become an electronic commercial billboard. Additionally, social media platforms have advertising tools that target populations with any given variables or characteristics. Products or services can be promoted to a specific population, such as 30–40 year old female groups. This function could advertise products and help health campaigns, including in the reproductive health sector^[20].

Hunt *et al*^[20], proposed tailored messages to target specific populations through social media as one of five key principles in a new framework of public health campaigns. The digital footprint left behind online provides a big data set of computer-based personality judgments as a targeted population^[21]. This digital environment enables an effective dissemination of information. Unfortunately, not all the information shared on social media is trustworthy information. Misinformation may spread intentionally or unintentionally in social media^[22].

From the data collected in our study, we found that advertisements were posted by legitimate healthcare institutions as providers of fertility services and by the informal herbal medicine sector. Of the 177 advertorial posts analyzed, 78% were authored by alternative/herbal medicine providers introducing their products, which claimed to help them gain conception. Infertile patients may face a dilemma between society's stigma and pressure to have a child^[17]. Thus, some may choose alternative/herbal medicine as a cheaper or more accessible treatment option. We do not have any data on traditional medicine users for infertility in Indonesia. However, another study in resource-limited settings claimed that traditional medicine users might be as high as 80% of the population for health purposes^[23]. A higher prevalence of commercial purpose posts in Bahasa suggested alternative/herbal medicine composed a more significant proportion of treatment options than modern regulated treatment options. Products advertised in Bahasa include traditional herbal medicines, plants, and shrub extracts that are used to treat infertility. Although alternative/herbal medicine has been used regularly in some regions, it is difficult to find evidence that supports its beneficial effect due to difficulties in identifying the contents of the products advertised^[24]. Some also reported complications associated with alternative and herbal medicine, but again, most of them did not clearly state the active compounds being used^[25]. The usage of these regimens with no evidence support may postpone patients with infertility to meet prompt treatment from medical doctors.

Patient experiences were the second most prevalent topic (28%). This result contrasts with studies of English posts on Instagram, as most posts related to infertility were patients' experiences (60%). Cultural differences might explain this finding. In many Asian and African countries, the ability of women to conceive is considered an important aspect of social life. Thus, infertility may cause catastrophic effects on the couples' lives, such as negative stigma, unstable household life, and anxiety and depression^[26–29]. With these consequences, it is more likely that infertility patients in Indonesia will not share such topics on Instagram or other social media.

Instagram as a social media platform is yet to be used optimally for educational purposes in Indonesia. This study showed that only 18% of the total analyzed content was categorized as educational. Physicians authorized 95% of the content. Physicians

should optimize social media to educate the community. Peyser *et al*^[6], also found a lack of physician involvement on Instagram (10%). Professional bodies may support doctors in sharing evidence-based data and correcting misleading news. The American College of Obstetricians and Gynecologists (ACOG) has published guidance for physicians on using social media in the patient-doctor relationship^[29]. Guiding social media usage in Indonesia may also benefit both doctors and patients.

The strengths of our study include the analysis of various types of posts, including images or videos of information on Instagram, and that it is one of the first studies to map fertility information in Bahasa on Instagram. However, a study on Instagram as a single social media platform may limit its generalization to other platforms. The chosen hashtags may not represent all the possible hashtags that patients may use. In addition, the 'private feature' on Instagram may prevent some posts from being observed.

As most posts on Instagram do not cite sources of information or are peer-reviewed, further research should be conducted to evaluate the educational quality of posts. The impact of social media on patients' knowledge and attitudes toward health-seeking behaviour and decision-making also needs to be examined. The patient-physician relationship evaluates the influence of social media on medical decision-making. Expanding the analysis to other platforms may broaden our understanding of fertility education on social media.

Conclusion

Over three million posts related to fertility in Bahasa have been authored on Instagram. Fertility-related posts were dominated by for-profit healthcare institutions and alternative/herbal medicines for commercial purposes. Fertility education using social media should be optimized as it may offer a low-cost communication platform for patients. Future studies should examine the educational quality of posts by author type.

Ethical approval

This study was approved by the Research Ethics Committee of the Faculty of Medicine, Universitas Indonesia, in November 2023, with ethical clearance number KET-1640/UN2.F1/ETIK/PPM.00.02/2023.

Consent

Not applicable.

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Conflicts of interest disclosure

The authors declare that there is no conflicts of interest in this study.

Research registration unique identifying number (UIN)

Not applicable.

Guarantor

The Guarantor is Achmad Kemal Harzif.

Availability of data and material

The datasets generated and/or analyzed during the current study are not publicly available due to ethical concerns but are available from the corresponding author upon reasonable request.

Provenance and peer review

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