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Is There an Application for Improving Marriage Satisfaction? An Overview of Smartphone Usage in Urban Young Adults' Marital Interactions

Adakah Aplikasi untuk Meningkatkan Kepuasan Pernikahan?
Penggunaan Ponsel Pintar dalam Interaksi Perkawinan pada Pemuda Perkotaan

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Abstract

Technological advancement is like a double-edged sword; that is, it has both positive and negative effects on marital interactions. Although previous studies have discussed the negative impact of excessive smartphone usage on marriage, smartphones, as a means of promoting positive marital interactions, require further investigation. Thus, this descriptive study provides an overview of smartphone usage that supports marital interactions. The participants included 265 married individuals (20-40 years of age) living in the Greater Jakarta area (Jabodetabek), who completed an online survey about smartphone usage in their marital interactions as well as a relationship satisfaction assessment. Thematic analyses of the qualitative data were conducted to describe smartphone habits such as the most frequently used applications, the most helpful features in supporting positive marital interactions, perceived benefits, etc. Correlations and cross-tabulations were also performed to describe the association between marital satisfaction and smartphone usage. The findings indicated that the frequency of smartphone usage did not correlate with marital satisfaction. However, smartphone usage with a spouse served as a tool for relationship maintenance. The results of this study can be helpful for young married adults in urban areas, especially those aiming to maximize smartphone usage in order to improve marital interactions and satisfaction.

Keywords: smartphone usage, marital interactions, marital satisfaction

Abstrak

Kemajuan teknologi ibarat pedang bermata dua yang memiliki efek positif dan negatif dalam interaksi perkawinan. Penelitian-penelitian sebelumnya telah membahas dampak negatif penggunaan ponsel pintar dan internet yang berlebihan pada pernikahan. Di sisi lain, penggunaan ponsel pintar sebagai sarana untuk mempromosikan interaksi pernikahan yang positif perlu dieksplorasi. Penelitian deskriptif ini bertujuan untuk menangkap ikhtisar penggunaan ponsel pintar yang mendukung interaksi pernikahan. Sampel berupa 265 pemuda yang telah menikah berusia 20-40 tahun dan tinggal di wilayah Jabodetabek menyelesaikan survei online tentang penggunaan ponsel cerdas dalam interaksi perkawinan dan penilaian kepuasan hubungan. Analisis data terdiri dari analisis kualitatif dan kuantitatif. Analisis tematik data kualitatif digunakan untuk menggambarkan kebiasaan pasangan dalam menggunakan ponsel cerdas, termasuk: aplikasi yang paling sering digunakan, fitur yang paling membantu dalam mendukung interaksi pernikahan yang positif, manfaat yang dirasakan, dan ancaman penggunaan ponsel cerdas dalam hubungan perkawinan. Korelasi dan tabulasi silang digunakan untuk menggambarkan hubungan kepuasan pernikahan dan penggunaan ponsel cerdas. Temuan menunjukkan bahwa frekuensi penggunaan ponsel cerdas tidak berkorelasi dengan kepuasan pernikahan. Namun, penggunaan smartphone dengan pasangan bisa berfungsi sebagai alat untuk strategi pemeliharaan hubungan di pasangan yang sudah menikah. Penelitian ini diharapkan dapat memberikan saran untuk orang dewasa muda yang menikah di daerah perkotaan untuk memaksimalkan penggunaan smartphone dalam mendukung interaksi positif dan meningkatkan keintiman dalam pernikahan di era modern.

Kata kunci: ponsel pintar, interaksi pernikahan, kepuasan pernikahan

1. Introduction

In recent years, the number of Internet users has been increasing on a global scale. According to the data compiled by Hootsuite and We Are Social in 2018, 53% or 4.021 billion people around the world are Internet users. In Indonesia, a survey by the Indonesia Internet Service Provider Association showed that 54.58% of the population are Internet users, 50.08% own mobile devices (smartphones/tablets), and 49.52% are 19–34 years of age, with the majority (72.41%) living in urban areas (APJII, 2018). Most of Indonesia's population also use smartphones (44.16%) or both smartphones and laptops/computers (39.28%) to access the Internet, compared to the 4.49% who only use laptops/computers (APJII, 2018). These findings indicate that the Internet and mobile devices are a common part of young adults' everyday lives, especially those in urban areas. Moreover, individuals in Indonesia access the Internet for personal reasons on a daily basis (79%), with an average of eight hours and 51 minutes per day (We Are Social & Hootsuite, 2018). In this regard, the time spent on the Internet by young adults is comparable to normal working hours. Furthermore, chatting (89.35%) and accessing social media sites (87.13%) are the top two most frequently used services on the Internet (APJII, 2018). This also indicates that the Internet and smartphones are the normal way to connect with others, especially among young adults.

Smartphones, in this case, are mobile phones that perform many of the functions of a computer. Such devices also have a touchscreen interface, Internet access, and an operating system capable of running/downloading applications. They also expand the capabilities of a conventional telephone by adding additional functions such as web browsing, emailing, social networking, audio/video consumption, gaming, and learning applications (Shin, Shin, Choo, & Beom, 2011). Thus, smartphones have become important devices in young adults' daily lives, especially those in Indonesia who seek information, shop for various products, and socialize with their friends, families, and spouses. In regard to the latter, since building an intimate relationship and marriage are central to young adults (Chow, Claxton, & van Dulmen, 2015), the present study focuses on how young adult couples use smartphones to interact with one another.

Technology, especially the Internet, has a significant influence on young adult's social interactions. Internet properties, such as anonymity, accessibility, affordability, approximation, acceptability, etc., also influence the way couples establish rules, roles, and boundaries with one another (Finkel, Eastwick, Karney, Reis, & Sprecher, 2012; Hertlein, 2012). More specifically, smartphone usage has influenced the way young adults interact in their respective marriages. According to a 2013 PEW survey, 66% of married or committed adults used mobile phones, the Internet, and social media sites (Lenhart, Duggan, & Smith, 2014). Even though the majority of smartphone users (72%) stated that being on the Internet did not impact their relationship, 27% indicated that such technology did have an impact on their relationship (Lenhart et al., 2014). Moreover, among the participants that reported a technological impact, especially those 18–29 years of age, 41% indicated that they felt closer to their partners after sending a text message (Lenhart et al., 2014). Conversely, 18% stated that smartphone usage created some conflicts, while 8% reported that their partners' online activities infuriated them (Lenhart et al., 2014). Furthermore, technofence or intrusions in couples' interactions, due to technology (such as televisions, computers, smartphones, etc.), predicted conflicts over technology use, relationship satisfaction, depression, and life satisfaction among women (McDaniel, 2015; McDaniel & Coyne, 2016). Thus, it can be concluded that, although smartphones and the Internet are the sources of the certain problems among young adults, they can be used as tools for improving communication and intimacy.

Previous studies have focused on the relational problems that arise due to smartphone usage. For example, the frequency of media usage (Dew & Tulane, 2015), problematic media use (Spencer, Lambertsen, Hubler, & Burr, 2017), and compulsive Internet use (Kerkhof, Finkenauer, & Muusses, 2011) have a negative impact on relationship satisfaction, both direct and indirectly. Moreover, phubbing (i.e., ignoring one's companion by focusing on a mobile device) not only increases the occurrence of conflicts and reduces relationship satisfaction (Roberts & David, 2017), but it also increases depressive symptoms and reduces overall life satisfaction (Wang, Xie, Wang, Wang, & Lei, 2017). Furthermore, smartphone usage, the Internet, and social media sites, such as Facebook, can be triggers for online infidelity (Cravens, Leckie, & Whiting, 2013; Hertlein & Piercy, 2006). Conversely, an experimental study showed that training couples to not use their smartphones for two hours a day did not necessarily result in higher relationship satisfaction or communication (Borrelli, 2015). This indicates that limiting smartphone usage does not yield positive outcomes on relationships, since smartphones have become an acceptable way to communicate among couples. Therefore, it is important to examine the ways that smartphone usage can improve relationship satisfaction and intimacy among young adult couples.

Previous research has also showed that technological usage has a positive impact on the relationship process. One hermeneutic study regarding online gaming and interpersonal relationships indicated that online gaming made its users

more relaxed, thus having a positive impact on their relationships (Hertlein & Hawkins, 2012). In a qualitative study of 10 married couples, it was found that a Blackberry device helped the partners resolve certain issues through emails and allowed them to arrange specific times to be spend together (Czechowsky, 2009). More recent studies indicated the advantages of technology in relationship development, relationship maintenance, and relationship enhancement strategies (Hertlein & Ancheta, 2014; Juhasz & Bradford, 2016; Ogolsky, Rice, Theisen, & Maniotes, 2017). All of these studies indicate the potential of utilizing smartphones to support marital interactions. However, further exploration is necessary regarding the usage of smartphones in marital interactions and how such devices can increase marital satisfaction.

Marital satisfaction has been defined as subjective, global evaluations of a marital relationship (Fincham & Beach, 2006; Fincham & Bradbury, 1987; Funk & Rogge, 2007; Lavner, Karney, & Bradbury, 2014; Norton, 1983), which is comparable with the definition of life satisfaction, as a cognitive-judgmental aspect of subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985). According to Funk and Rogge (2007), a marital relationship can be measured by using the Couple Satisfaction Index (Funk & Rogge, 2007). In the relationship domain, marital satisfaction can be a predictor of marital success (Karney & Bradbury, 1995), positive communication (Lavner, Karney, & Bradbury, 2016), and lower infidelity (McNulty, Meltzer, Makhanova, & Maner, 2018). Meanwhile, in the individual domain, marital satisfaction has a positive correlation with physical health (Proulx & Snyder-Rivas, 2013; South & Krueger, 2013), happiness, and subjective well-being (Carr, Freedman, Cornman, & Schwarz, 2014; Proulx, Helms, & Buehler, 2007), while having a negative correlation with depression (Whisman, 2014).

Marital satisfaction can also be predicted by intrapersonal, relational, and contextual factors (Karney & Bradbury, 1995; McNulty & Fincham, 2012; McNulty & Russell, 2010). Karney and Bradbury (1995) indicated that the Vulnerability-Adaptation-Stress (VAS) Model can be used to explain how such factors impact marital satisfaction. Moreover, the VAS Model can emphasize the importance of relational factors or couples' ability to predict marital satisfaction. In accordance with the VAS Model, social exchange frameworks, such as the investment model, the interdependence theory, and the equity theory, can be used to conceptualize how relationship maintenance strategies are associated with relationship satisfaction and commitment (Ogolsky & Bowers, 2012). In this regard, relationship maintenance includes a broad array of activities, behaviors, and interactions that individuals perform to keep their relationship in a desired state (Dainton, 2013; Ogolsky et al., 2017). It also includes five behaviors: positivity, openness, assurance, networking, and task sharing (Dainton, 2013). For example, positivity (i.e., being upbeat and cheerful) and assurance (reassuring the partner about one's commitment) can be conducted either face-to-face or online. Such interactions have been shown to have a positive impact on relationship satisfaction among university students (Dainton, 2013). Since Facebook, Twitter, and other social network sites are easy to access in smartphones, such devices have become an important and convenient medium for additional relationship maintenance among married couples (Juhasz & Bradford, 2016; Ogolsky et al., 2017).

However, the VAS model does not include technology, such as smartphones, as a medium for interacting and maintaining marital satisfaction. As mentioned earlier, couples' interactions in marriages can be influenced by such technology. Therefore, smartphones should be able to support relationship maintenance by increasing intimacy, facilitating conflict resolution, and coordinating husband-wife tasks. However, it is important to understand how smartphone usage can support marital satisfaction. In this regard, the purpose of this study is two-fold: 1) to determine how smartphone usage can support interactions among married couples; and 2) to understand how smartphone usage is related with marital satisfaction.

Finally, the research questions in this study are as follows:

- 1) How do couples use smartphones, especially in regard to (a) the types of interactions, (b) the situations in which they interact, (c) the positive and negative effects, and (d) how such devices help couples interact over short and long distances.
- 2) How is the frequency of spousal interactions via smartphones related with marital satisfaction?
- 3) What types of mediums via smartphones are used to increase marital satisfaction?

2. Methods

Variables. In this study, marital interaction includes all types of communication that occurs both directly (i.e., synchronously) and indirectly (i.e., asynchronously). Such interactions include communication via texts, video calls, and voice calls or indirect communication via reminders on automatic calendars. As stated earlier, smartphones refer to mobile phones in which the functions resemble those of a computer (e.g., text messages, telephone, video calls, Internet,

Microsoft Word, computing, applications, and social media sites). Other variables include marital satisfaction, and the spouses' overall evaluation of their marital relationship, measured with the Couple Satisfaction Index (Fincham & Bradbury, 1987; Funk & Rogge, 2007; Lavner et al., 2014; Norton, 1983; Williamson, Karney, & Bradbury, 2013).

Participants. The participants were recruited by posting information about the study, along with a link to the questionnaire, which was to be completed through the author's and research assistants' social media accounts (Facebook, Instagram, Path, and WhatsApp) between September 13 and 18, 2017. The participants were then asked to share the link and information in their respective networks, along with the following criteria: married, 20–40 years of age, and living in Greater Jakarta. A total of 300 married individuals completed the online survey regarding smartphone usage and marriage. Among them, 35 participants were excluded because they either lived outside of Greater Jakarta (Jabodetabek), provided incomplete or inconsistent responses or were divorced. Overall, the response rate was 88.33%.

The majority of the participants were female ($N = 208$, 78.49%), and all of the participants were within the age range of 20 to 40 ($M = 30.39$, $SD = 4.40$). In regard to their marital status, all of the participants were married with durations ranging from 0 to 19 years ($M = 4.06$, $SD = 3.53$). The age in which the participants were first married ranged from 19 to 37 years ($M = 26.35$, $SD = 3.31$). All of the participants had between 0 and 4 children. As for their education, the majority had undergraduate degrees ($N = 156$, 58.9%), followed by master's degrees ($N = 69$, 26%), vocational degrees ($N = 20$, 7.2%), high school degrees ($N = 19$, 7.2%), and doctoral degrees ($N = 1$, 0.4%). In relation to their occupations, 101 participants were private employees (38.1%), 56 were housewives/husbands (21.1%), 46 were civil employees (17.4%), 33 were professionals (12.5%), 17 were entrepreneurs (6.4%), 8 were undergraduate students (3%), and 4 were freelancers (1.5%). All of the participants lived in the Greater Jakarta area (Jabodetabek). More than half of the participants (53.9%) lived in the outskirts of DKI Jakarta, including Tangerang (18.1%), Depok (16.2%), Bekasi (11.7%), and Bogor (7.9%). Meanwhile, the others lived in the DKI Jakarta region, including South Jakarta (16.2%), East Jakarta (15.45%), West Jakarta (7.4%), North Jakarta (2.9%), and Central Jakarta (4.4%).

Measures. The Couple Satisfaction Index (CSI-4), constructed by Funk and Rogge (2007), was used to measure the participants' overall evaluation of their respective marriages. The adaptation of this index was made by translating the items from English into Bahasa Indonesia. The test of legibility was performed by a research assistant, the findings of which led to a modification in the response formats of Statements 3 and 4 from 6 choices to 5. Meanwhile, there were no modifications for the responses in Items 1 and 2. In this case, Cronbach's alpha was greater than 0.80, indicating good internal consistency.

Research Design. This descriptive study specifically used an online survey as a means of data collection. The survey consisted of open-ended questions (for qualitative data) as well as closed-ended questions (for quantitative data). The qualitative data was analyzed by thematic analysis, whereas the quantitative data was analyzed through non-parametric correlation (Spearman's rank correlation) and cross tabulation. The survey itself began with a cover letter, followed by an informed consent form for the participants. The first section consisted of one closed-ended question, i.e., Do you use a smartphone to interact with your spouse? (Yes/No), and the following open-ended questions: 1) If Yes, then what type of interaction do you and your spouse frequently perform with a smartphone? [Please elaborate with examples]; 2) In what type of situation do you usually use a smartphone to interact with your spouse? [Please elaborate with examples]; 3) In your opinion, what are the positive effects of using a smartphone to interact with your spouse?; 4) When you and your spouse are apart (e.g., the wife is at home, while the husband is at work), how does a smartphone support your interactions?; 5) When you and your spouse are in the same location (e.g. wife is in the bedroom, husband is somewhere in the house), how does a smartphone support your interactions?; 6) What types of applications support your interactions when you are away from your spouse?; 7) What types of applications support your interactions when you are in the same location as your spouse?; and 8) In your opinion, what are the negative effects of using a smartphone to interact with your spouse? The second section consisted of closed-ended questions regarding the participants' smartphone habits, the third section included statements and questions related to marital satisfaction, and the fourth section focused on the participants' personal data.

Coding Procedure. The researchers used eight open-ended questions to examine the effect of smartphone usage on the interactions between the couples. First, the research assistants reviewed all of the participants' responses for each question and tallied the similar responses by using Microsoft Excel. Second, after completing the coding frequency, the research assistants and the author held a meeting to identify the commonalities among the responses and grouped the similar responses into one category. This discussion also allowed new categories to emerge. Third, the team formulated a coding book that consisted of the codes and descriptions of each elicited code. Finally, the author and the research assistants assumed the role of inter-raters and independently determined whether the responses belonged to any of the

created codes. The process of encoding the qualitative information and systematically converting it into quantitative data is known as “thematic analysis” (Boyatzis, 1998).

The inter-raters placed one response from each participant into several different categories, after which inter-rater reliability (using Krippendorff's Alpha) was carried out to test the reliability of the categories. Based on Cohen's kappa coefficient, most of the categories had to be eliminated, while some were modified due to insufficient reliability. Thus, in the second modification, the author and one research assistant modified the categories, while the two other research assistants conducted inter-rater reliability tests based on the new and modified categories. In the second inter-rating process, the research assistants were only allowed to categorize one response into one category. If the response fell into more than one corresponding category, then the research assistants created a new type of response in order for each response to correspond to only one category. Finally, inter-rater reliability was determined by using Cohen's kappa coefficient. In this case, any coefficient of less than 0.40 was eliminated. Moreover, since the question related to the positive effects of using a smartphone in marital interactions yielded no reliable results, it was eliminated from further analysis. Overall, the reliability estimates for the seven questions ranged from .40 to 1, indicating moderate to substantial reliability (McHugh, 2012).

3. Results

Participants' Smartphone Usage. According to the results, all of the participants were smartphone users in which the majority used Android devices (67.5%), followed by iPhones (18.1%) and Blackberry devices (0.8%). A total of 36 participants used both Android and iPhone devices (13.6%). When asked about how often they used their smartphones, only one participant used a smartphone once a day (0.4%), while two participants used their smartphones twice a day (0.8%). The rest of the participants used their smartphones more than three times a day (27.9%), with the majority using them many times a day (70.9%). Moreover, the participants were asked about the smartphone functions that they mostly used. As shown in Table 1, the top two functions were chatting via text and phone (72.83%) and information sharing.

As shown in Table 2, when specifically asked about how much they interacted with their spouses via a smartphone, the majority communicated with their spouses more than three times a day (49.4%), followed by many times a day (30.2%), once a day (6%), and twice a day (14.3%). They were also asked about how they communicated with their spouses via a smartphone. The majority stated that it was through short texts (e.g., SMS, WhatsApp, Line, Telegram, Facebook (FB) Messenger, Instagram) (57.4%), followed by voice calls (7.2%), video calls (4.8%), and social media sites (0.4%). Only 81 participants reported that they communicated with their spouses without using a smartphone (30.6%).

Table 1. Smartphone functions most often used and the frequency of overall smartphone usage

Functions	%	Frequency	%
Chatting	72.83	Once a day	0.4
Information sharing	20	Twice a day	0.8
Economical purposes	3.4	Three times a day	27.9
Entertainment	2.64	Many times a day	70.9
Camera	0.7		
All functions	0.38		

Table 2. Frequency of spousal interactions via smartphones and the mediums used for such interactions

Frequency	%	Mediums	%
Once a day	6	Short texts	57.4
Twice a day	14.3	Voice calls	7.2
Three times a day	49.4	Video calls	4.8
Many times a day	30.2	Social media sites	0.4
		Face-to-face	30.6

Qualitative Results (See Appendices)

Appendix Table 3 presents the results of the thematic analyses, which include: a) the types of interactions via smartphones; b) the situations in which the couples interacted via smartphones; c) smartphone usage that supports interactions when the couples are geographically apart (e.g., home-office); d) smartphone usage that supports interactions when the couples are geographically close (e.g., in the same room); e) smartphone features used in distal interactions; f) smartphone features used in proximal interactions; and g) the negative impact of smartphone usage on marital interactions.

Types of interactions (See Appendix Table 3). Overall, the 265 participants yielded 438 responses. However, only 390 responses were coded into the reliable category, upon agreement between the two inter-raters (89.04%). The responses indicated that the participants primarily used smartphones to communicate, both synchronously and asynchronously. Moreover, the participants used smartphones to maintain their relationships by, for example, showing openness, task sharing, and coordinating plans.

Situations (See Appendix Table 4). Overall, the 265 participants yielded 339 responses describing the types of situations in which they used smartphones to interact with their spouses. However, only 128 responses were coded into the reliable category, upon agreement between the two inter-raters (37.35%). The responses revealed that the participants used smartphones when they were apart from their spouses, during leisure time, and when dealing with emotional situations.

Smartphone usage that supports distal interactions (See Appendix Table 5). Overall, the 265 participants yielded 320 responses. However, only 119 responses were coded into the reliable category, upon agreement between the two inter-raters (37.2%). The participants perceived that smartphones supported synchronous and asynchronous communication when they were apart from their spouses. Smartphones also helped them be more open with one another and facilitate task sharing, even when they were not geographically nearby.

Smartphone usage that supports proximal interactions (See Appendix Table 6). Overall, the 265 participants yielded 284 responses. However, only 213 responses were coded into the reliable category, upon agreement between the two inter-raters (75%). The participants perceived that smartphones supported their interactions through, for example, playing games, watching videos, and discussing information. Conversely, 44.6% of the responses indicated that smartphone usage did not support such interactions when the participants and spouses were in the same location.

Smartphone features that support distal interactions (See Appendix Table 7). Overall, the 265 participants yielded 439 responses. However, only 395 responses were coded into the reliable category, upon agreement between the two inter-raters (90%). In this case, the methods used ranged from traditional usage (e.g., telephone and texting) to Internet-based platforms such as WhatsApp and Google Hangout. The participants also used video call features, such as Skype, and various social media sites (e.g., Instagram and Facebook). Other interesting features that emerged, despite their low frequency, included the use of productivity features (e.g., Tokopedia and online banking), web browsers, cameras, and GPS.

Smartphone features that support proximal interactions (See Appendix Table 8). Among the 393 responses, only 348 were agreed on by the inter-raters (88.55%). The responses (n = 348) revealed that the participants perceived social media, entertainment applications, chatting, web browsers, and documentation (cameras) as the smartphones features that supported their marital interactions when they were in the same location.

Negative effects of smartphones (See Appendix Table 9). The 265 participants in this study yielded 284 responses. However, only 209 responses were coded into the reliable category, upon agreement between the two inter-raters (73.59%). The responses showed that the negative effects of smartphones on marital interactions included feeling ignored and miscommunication. Moreover, some participants perceived that smartphones provide opportunities to obtain alternative partners. Overall, the majority of the responses were coded as "other (69.8%), which means that the inter-raters agreed on the existence of an additional category, besides the existing ones.

Quantitative results

In terms of marital satisfaction, the data was divided into three categories, based on range (0 to 19) and percentile. The majority of the participants fell under the high marital satisfaction group, with only 26.3% categorized in the low marital satisfaction group (n = 70) (see Table 10).

Table 10. Marital satisfaction scores

Marital satisfaction	Range	n	%
Low marital satisfaction	0 - 13	70	26.3%
Average	14 - 15	75	28.3%
High marital satisfaction	16 - 19	120	45.3%

The non-parametric correlations showed that marital satisfaction did not have a significant correlation with the overall frequency of smartphone usage ($r = 0.003$, $p = 0.963$), the frequency of smartphone usage when interacting with a spouse ($p = 0.085$, $p = 0.166$), the duration of marriage ($r = -0.050$, $p = 0.416$), and the number of children ($r = 0.043$, $p = 0.484$). However, the frequency of smartphone usage when interacting with a spouse did have a significant negative correlation with the duration of marriage ($p = -0.126$, $p = 0.040$) and the number of children ($r = -0.133$, $p = 0.031$), whereas it had a significant positive correlation with the overall frequency of smartphone usage ($r = 0.240$, $p < 0.01$).

According to Table 11, the cross-tabulation results of the marital satisfaction groups (low and high, $n = 190$) and the mediums used for spousal interactions (see Table 2) showed no significant correlation ($\chi^2 (4, N = 190) = 22.13$, $p = 0.697$). In addition, the couples with high and low marital satisfaction did not differ in the most discussed topic ($\chi^2 (17, N = 190) = 17.933$, $p = 0.393$). However, the cross-tabulation results showed a significant correlation between high and low marital satisfaction in term of the frequency of spousal interactions via smartphones ($\chi^2 (3, N = 190) = 14.629$, $p = 0.002$). Finally, the couples in the high marital satisfaction group were less likely to interact only once a day via their smartphones.

Table 11. Marital satisfaction scores

Categories	Low marital satisfaction (n = 70)	High marital satisfaction (n = 120)	χ^2	p
Frequency of spousal interactions via smartphones			14.629	0.002
Once a day	14.3%	1.7%		
Twice a day	8.6%	16.7%		
More than three times a day	54.3%	50.0%		
Many times a day	22.9%	31.7%		
Mediums used for spousal interaction			22.13	0.697
Short texts	57.1%	55.0%		
Voice calls	5.7%	10.8%		
Video calls	5.7%	4.2%		
Social media sites	0.0%	0.8%		
Face-to-face	31.4%	29.2%		

4. Discussion

This study examined the types of interactions and situations in which couples use smartphones to interact, in addition to investigating the smartphone features that support marital interactions. This study also determined how smartphone usage correlated with marital satisfaction in young adult urban couples. The majority of the participants lived in urban areas and used smartphones throughout the day, mostly through texting and voice calls. Moreover, most of the participants used smartphones to interact with their spouses more than three times a day. However, the frequency of smartphone use, both generally and specifically in spousal interactions, did not correlate with marital satisfaction. This finding showed that smartphone usage may damage marital satisfaction, not in terms of frequency, but in regard to how

and when one uses such devices. Furthermore, the higher the frequency of smartphone usage correlated with a shorter marriage duration and a fewer number of children. Thus, it was important to determine how couples interact with one another via smartphones and how such devices support their marital interactions.

The results of the thematic analyses revealed that the participants used smartphones to communicate (both synchronously and asynchronously) with their spouses in order to maintain the relationship, obtain/provide information, and perform certain tasks. In terms of situations, the participants used smartphones when they were apart from their spouses (e.g., during leisure time and when dealing with emotional situations). This study also revealed that smartphones served as a relationship maintenance tool for marital interactions. In terms of smartphone utilization related to distance, the participants perceived that smartphones supported their distal interactions (synchronously or asynchronously) and allowed them to share information and coordinate their activities. According to the relationship maintenance theory, coordinating an activity, such as planning a grocery list, is an example of task sharing (Canary & Yum, 2016). In the present study, one of the participants used a smartphone to remind her spouse to pay the electricity bill or purchase groceries. Moreover, the smartphone features that supported distal marital interactions included instant messaging applications (e.g., WhatsApp, Google Hangout, etc.), telephone calls, video applications (e.g., Skype), and social media sites (e.g., Instagram and Facebook). In accordance with the main function of smartphones, as communication devices, longitudinal research showed that satisfaction is directly related with communication (Lavner et al., 2016).

Similarly, smartphones also supported marital interactions when the spouses were together in the same location (proximal interactions). In this regard, social media and entertainment features occurred more than communication features, as functions that supported proximal marital interactions. This indicates that smartphones can be beneficial in proximal marital interactions if they are used as a shared activity. For example, the participants in this study used social media as a face-to-face conversation starter with their partners. They also enjoyed listening to music and watching videos together via their smartphones. Previous research has shown that shared activities can serve as a relationship maintenance strategy, since it promotes closeness among couples (Girme, Overall, & Faingataa, 2014). Despite the positive effects of smartphones on marital relations, previous studies have highlighted the negative outcomes of such use. In the present study, smartphones induced jealousy among some of the participants, since their partners used such devices to communicate with others of the opposite gender. This finding replicates those of previous studies, which found that smartphone usage, the Internet, and social media sites are thought of as triggers for online infidelity (Cravens et al., 2013; Hertlein & Piercy, 2006). Thus, the effects of smartphone utilization on marital outcomes depend on how individuals use such devices. More specifically, if one utilizes a smartphone to communicate his/her feelings and to coordinate tasks, they he/she is using a smartphone as a relationship maintenance tool. Conversely, if it is used to communicate with others, while being with another partner, then it can be perceived as a threat to the relationship.

The results of this study are in accordance with Hertlein and Ancheta's (2014) open-ended survey of 410 undergraduate students regarding the ways technology both supports and interferes with intimate relationships. They identified the following reasons for using computers and texting in relationships: relationship development, management, and enhancement. Compared to the participants in Hertlein and Ancheta's (2014) study, the present study included more homogenous participants (i.e., married, 20-40 years of age, and living in an urban area) and asked more specific questions on how smartphones supported their marital interactions. Hence, it is useful to compare the reasons for using smartphones in the relationship enhancement category.

One of the relationship enhancement themes that emerged in Hertlein and Acheta's (2014) study was the use of smartphones to improve long distance relationships. In this regard, the participants in the present study reported that smartphones not only helped them communicate when they were apart for a long period of time (e.g., a long-distance relationship), but also when they were apart for a short period of time. This is understandable since most of the couples lived in urban areas and commuted at least 40 kilometers each way to work (Malik & Halim, 2016). Another theme that emerged in Hertlein and Ancheta's (2014) study was "spicing up one's sex life." However, this response was not found in the present study. Thus, future studies should explore the psychological construct underlying this difference.

In general, there were similar patterns between the participants in the high and low marital satisfaction categories, based on the mean ($M = 14.67$, $Sd = 3.40$). The descriptive statistics showed that the mean for each item ranged from 3.18 to 3.39, with a median between 3 (happy and satisfied) and 4 (very happy and very satisfied). This indicates that all of the participants were relatively happy and satisfied with their respective marriages, even after they were divided into the "low" and "high" groups. However, this skewed distribution could have been the result of the snowball sampling technique, as opposed to the random sampling technique. Moreover, given the nature of the participants' recruitment

through public platforms, those who joined were the ones who were willing to participate. According to Costigan and Cox (2001), volunteers in psychological research, especially family-related research, tend to have certain characteristics due to a self-serving bias. Thus, the findings of this study must be interpreted cautiously. Perhaps future research should explore a similar research question in a more diverse pool of married couples, while using the random sampling technique.

Other limitation of this study is that the online survey method relied on the participants' self-reported ability to articulate their thoughts and opinions. As depicted in the results, the participants provided short answers, despite the researcher's request to elaborate on how smartphones either positively or negatively affected their marital interactions. Therefore, the results were limited to the types of interactions and what smartphone features supported marital interactions. In this regard, future studies can enhance the understanding of smartphone usage and marital satisfaction by constructing objective measurements based on the types of interactions that improve such satisfaction.

In terms of data collection, the online survey method included several strengths and limitations. This approach was convenient for the researchers, due to the time limitation and cost efficiency (Lefever, Dal, & Matthíasdóttir, 2007). However, Lefever et al. (2007) found that this approach was too time consuming and that the participants lost interest before completing the questionnaire. Naturally, this yielded inaccurate responses. In contrast, another study concluded that web-based surveys yield more data on sensitive questions (e.g., drug use, sexual behaviors, voting, and income), compared to paper-based surveys of university students (Kays, Gathercoal, & Buhrow, 2012). Again, in order to overcome this limitation, future research should use the observational method to measure marital interactions and correlate the types of interactions that use smartphones to increase marital satisfaction.

Finally, this study explored the negative effects of smartphones on marital satisfaction, which included miscommunication (due to dimensional limitations) and proneness to infidelity. The results are in accordance with those of Hertlein and Ancheta (2014), which included distancing, impaired trust, and lack of clarity. However, in the present study, only 209 responses (73.59%) fell under the reliable category, upon agreement by the inter-raters. Moreover, 69.8% of the responses were included in the "other" category ($\kappa = 0.52$). Therefore, a new category that describes the negative effects of smartphones in marital interactions is necessary. A possible category is partner phubbing in which a partner ignores his/her spouse in order to pay attention to a smartphone or similar device (Roberts & David, 2016).

5. Conclusion

This study confirmed that urban couples frequently use smartphones to interact with their spouses, especially through text messages and various platforms such as SMS, WhatsApp, Line, and Instagram. Despite the limitations, this study provided insight on how married individuals in urban areas use smartphones in their interactions. There was also a recurring pattern in which the individuals in the high marital satisfaction group provided more responses on how smartphones supported their spousal interactions. Contrary to previous studies on the negative impact of smartphones on relational outcomes, the present study found that smartphones can be used as a relationship maintenance tool. Therefore, there is an opportunity to further examine the communication skills used via smartphones, as one of the indicators of couple adaptation in the VSA model (Karney & Bradbury, 1995). It is also relevant to modernize the VSA model, since it was constructed prior to the smartphone era. Further research can also assess how adaptive smartphone usage is related to personal vulnerabilities such as insecurity, stress, and marital satisfaction. In terms of the relationship maintenance theory, it is also useful to expand the existing measurement with more specific items that focus on positivity, openness, assurance, and task sharing facilitated by smartphones, since such aspects are relevant for modern couples in urban areas. At a practical level, marriage counselors, especially those for urban couples, can suggest smartphone features that can support their interactions. Moreover, the results of this study can be used to educate couples on how to use smartphones during various situations. Finally, marriage counselors can educate couples to distinguish between adaptive and maladaptive smartphone usage as well as promote culturally acceptable smartphone usage that can increase marriage satisfaction.

Declaration of Interest

The author reports no conflicts of interest in this study.

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Appendices

Appendix Table 3. Types of interactions

Types of Interactions	n (%)	Descriptions	Examples
Asynchronous communication ($\kappa = 0.89$)	167 (42.8%)	Asynchronous communication is the exchange of messages on a network or computer device.	"Texting, information sharing (e.g., news, articles, shopping lists, creative ideas, etc.)" - R2. "Chatting" - R135.
Synchronous communication ($\kappa = 0.92$)	148 (37.9%)	Smartphones support real-time information exchange (e.g., telephone and video calls).	"Telephone and video calls at certain moments" - R20. "Asking 'where are you?' and 'what are you doing?'" - R27.
Relationship maintenance ($\kappa = 0.74$)	60 (15.4%)	The responses do not explain the type of communication, but rather the interactions that occur. The goal of the interactions is to maintain and enhance the relationship.	"Informing my spouse about my situation, asking about his activity, what he is doing, what time he will come home, etc." - R176. "Daily communication when I am at the office" - R127.
Planning and organizing ($\kappa = 0.72$)	15 (3.8%)	The responses do not explain the type of communication, but rather the interactions that occur. The goal of the interactions is to coordinate with the spouse regarding, for example, their children and household affairs.	"Telling my husband about our child's behavior and reminding him of things that he should do" - R305. "Sending event invitations via email and the automatic calendar" - R165.

Appendix Table 4. Situations

Situations	n (%)	Descriptions	Examples
Apart from spouse ($\kappa = 0.78$)	106 (82.8%)	During situations in which the spouses are far away from one another.	"When I am not with my spouse (e.g., when I work)" - R261. "When I am at the office or when we are apart" - R2. "When we are apart" - R40.
Leisure time ($\kappa = 0.73$)	16 (12.5%)	Communication with smartphones during free time/night time.	"Laid-back situation" - R216. "When work is idle" - R235. "Lunch time, to remind my spouse to eat" - R13.
Emotional situations ($\kappa = 0.44$)	6 (4.7%)	Communication with smartphones when, for example, a spouse misses his/her partner.	"When I miss my partner" - R201. "Reducing my husband's longing for his children, since he has been gone all day" - R215.

Appendix Table 5. Smartphone usage – distal interactions

Distance support	n (%)	Descriptions	Examples
Synchronous communication ($\kappa = 0.53$)	41 (34.5%)	Smartphones support real-time information exchange (e.g., telephone and video calls).	“Exchanging information not only through voice calls, but through video calls”- R29. “[smartphones support my marital interaction via] video calls or phone calls”- R16.
Openness ($\kappa = 0.44$)	37 (31.1%)	Smartphones support spouses to stay in touch, discuss relevant information (e.g., one’s feelings, advice, etc.), and resolve conflicts.	“I can provide updated information to my husband” - R317. “I am able to know my husband’s activity” - R307.
Asynchronous communication ($\kappa = 0.59$)	35 (29.4%)	Asynchronous communication is the exchange of messages.	“Chatting, social media” - R5. “Sending text messages or selfies via WhatsApp” - R22. “I can leave a message that will be read by my husband when he is in a meeting” - R38.
Task sharing ($\kappa = 0.53$)	6 (5%)	Smartphones support spousal interactions through task sharing and keeping track of one’s household responsibilities.	“To update news and organize our schedules” - R326. “It made communication easier and faster (e.g., asking my spouse to buy things, sending pictures of our children, and monitoring my husband’s situation if he’s working late” - R4. “When I need to pay the electricity bill or something urgent, I can WhatsApp my husband. Very practical” - R118. “When I need to ask my husband to buy something on his way home, all I have to do is take a picture of the thing that I need” - R292.

Appendix Table 6. Smartphone usage - proximal interactions

Same location smartphone support	n (%)	Descriptions	Examples
Openness ($\kappa = 0.73$)	112 (52.6%)	Smartphones support spouses to stay in touch, discuss relevant information, and resolve conflicts.	“When we are in the same location, smartphones support our marital interactions through photo/news sharing and discussions” - R180. “As a tool for storytelling in which we can exchange information related to our personal lives” - R74.

Table 6 Continued

Smartphones do not support interactions ($\kappa = 0.80$)	95 (44.6%)	Smartphones do not support interactions or such devices are not used when the spouses are in the same room.	<p>“Smartphones support our interactions since we are able to watch and play games together” - R188.</p> <p>“We usually share links that are interesting or share interesting videos/photos” - R18.</p> <p>“When we are in the same location, smartphones do not support our interactions” - R100.</p> <p>“We try not to use our smartphones when we are together” - R180.</p> <p>“There are no interactions when using smartphones” - R135.</p> <p>“When we are in the same location, we choose not to use our smartphones” - R111.</p>
Support without a specific reason ($\kappa = 0.74$)	6 (2.8%)	Smartphones support interactions between the spouses in the same room.	<p>“Supporting” - R230.</p> <p>“Very supporting” - R206.</p>

Appendix Table 7. Smartphone features – distal interactions

Features – distal Interactions	n (%)	Descriptions	Examples
Chatting ($\kappa = 0.87$)	242 (61.3%)	Instant messaging applications and related features.	“Messaging apps (e.g., WhatsApp, texting, video calls, Google Hangout)” - R2. “Telephone” - R5. “WhatsApp” - R48, R62.
Video calls ($\kappa = 0.85$)	76 (19.2)	Features that allow the spouses to see their partners on their smartphones.	“Skype” - R4. “Video calls” - R10. “Video” - R12.
Social media ($\kappa = 0.93$)	64 (16.2)	Features that allow the spouses to obtain information through posts on social media sites.	“Instagram” - R439. “Facebook, sometimes” - R447. “IG, FB” - R69.
Productivity ($\kappa = 0.662$)	4 (1%)	Features that allow the spouses to complete certain tasks.	“Tokopedia” - R285. “Online banking” - R38. “Calendars” - R169.
Web browsers ($\kappa = 1$)	2 (0.5%)	Features that allow the spouses to obtain and exchange information with their partners.	“Search engines” - R40. “Web browsers” - R283.
Documentation ($\kappa = 0.59$)	3 (0.8%)	Features that allow the spouses to capture certain moments together.	“Camera” - R405, R445. “Camera” - R175.
Transportation/GPS ($\kappa = 1$)	3 (0.8%)	Features that inform the spouses of their partner’s location.	“GPS” - R39. “Find iPhone” - R204.
Other ($\kappa = 0.498$)	1 (0.3%)	Responses that do not fall under a certain category.	“Games” - R396.

Appendix Table 8. Smartphone features - proximal interactions

Feature – proximal interactions	n (%)	Descriptions	Examples
Social media ($\kappa = 0.87$)	74 (21.3%)	Features that allow the spouses to obtain information through posts on social media sites.	“Instagram, Facebook” - R184. “Facebook” - R394.
Entertainment ($\kappa = 0.79$)	78 (22.4%)	Features that allow the spouses to have fun together (e.g., reading, playing games, listening to music, etc.)	“Maybe Spotify. We use it during meals” -R400. “YouTube, news sites, news aggregators (LINE today), e-papers, and other applications to discuss the news” - R329.
Chatting ($\kappa = 0.91$)	64 (18.4%)	Instant messaging applications and smartphone features such as telephone and text messaging.	“SMS” - R11. “WhatsApp” - R16. “WA, LINE” - R387. “WhatsApp, BBM” - R379.
Web browsers ($\kappa = 0.91$)	41 (11.8%)	Features that allow the spouses to obtain and exchange information with their partners.	“Google” - R393. “Internet” - R397. “Google” - R54, R65.
Documentation ($\kappa = 0.80$)	20 (5.7%)	Features that allow the spouses to capture certain moments together	“Camera” - R100. “Sophisticated camera to capture certain moments” - R12.
Other ($\kappa = 0.87$)	71 (20.4%)	Responses that do not fall under a certain category.	“Nothing” - R12, R13. “We rarely use smartphones when we are together” - R73.

Appendix Table 9. Negative effects of smartphones

Negative effects	n (%)	Descriptions	Examples
Negative affect ($\kappa = 0.45$)	35 (16.74%)	Smartphones foster negative feelings and thoughts regarding oneself and one's spouse.	“.. sometimes I feel worried if my husband has not contacted me in a long time or when his smartphone is unreachable” - R240. “Sometimes it makes me upset if my husband is busy with his smartphone when we are together” - R259.
Miscommunication ($\kappa = 0.65$)	22 (10.5%)	Smartphones foster miscommunication due to dimensional disadvantages such as being unable to read the tone of the message and see facial expressions.	“The smartphone makes my partner forget to eat, drink, pray, use the toilet, etc.” - R.192. “Misunderstandings” - R241. “Sometimes we have misunderstandings because we cannot understand the tone and point of the communication” - R266.
Prone to infidelity ($\kappa = 0.69$)	7 (3.35%)	Smartphones provide opportunities to obtain alternative partners.	“Being jealous because it provides opportunities to interact with people from the opposite gender” - R61. “There is no direct interaction and

Other (κ = 0.52)	145 (69.45%)	Responses that do not fall under a certain category.	<p>partners can have their own personal activities through their smartphones – It can be a tool for infidelity” - R262.</p> <p>“My partner cannot focus during our conversation due to excessive game playing that takes most of his attention away” - R.185.</p> <p>“Lack of quality time because we lose track of time and are entertained by our smartphones” - R228.</p>
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