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Message applications in the doctor-patient relationship as a stressor

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SUMMARY

OBJECTIVE: The aim of this study was to assess the use of smartphones' messaging apps as a stressor affecting the well-being of gynecologists who use this tool to communicate with patients.

METHODS: A cross-sectional study was conducted with gynecologists who use message applications to communicate with patients. Participants answered the WhatsApp Stress Scale, Oldenburg Burnout Inventory, and the techno-stress questionnaire. The population sample consisted of gynecologists and obstetricians selected by convenience.

RESULTS: Physicians who spent more time using WhatsApp to communicate with patients had higher levels of stress (p=0.010), Burnout (p<0.001), and techno-invasion score (p<0.05).

CONCLUSIONS: A positive association was found between the high frequency of WhatsApp usage for communication with patients and doctor's Burnout and stress, negatively influencing professional's well-being.

KEYWORDS: mobile applications, occupational stress, physician-patient relations, smartphone

INTRODUCTION

We have experienced a technology-driven revolution making effects on our lives. Technology tools take over our daily activities and influence what we consume and how we share experiences with others[1]. Healthcare is not immune to it. Recently, technology is integrated into medical surveillance, diagnosis, treatment, and patient comfort[2]. Therefore, it is not surprising that the 21st century has brought challenges to medical professionals[3].

When computers became available in the 1990s, digital health emerged, followed by telemedicine as soon as the computers could be connected to networks. Technology advanced at an unprecedented pace, while smartphone penetration summoned mobile health[4]. Seemingly, smartphones and communication applications have become an irreplaceable tool in patients' care assistance. Instant messaging services have created a new era in clinical data exchange between patients and clinicians[5,6].

The real-time exchange of interacting technologies enables users to reach doctors immediately, anywhere at any time[7]. WhatsApp Messenger (WhatsApp Inc, Menlo Park, CA, USA), an app emerged in 2009, is part of how doctors and patients communicate in the 21st century, although it had not been specifically developed for medical purposes[8].

WhatsApp is a communication tool that can be downloaded free of cost from the Internet and is available for all mobile platforms. It only requires Internet connection in mobile and allows users to send messages, photos, and videos[9]. Other benefits of the app are improvement of communication, no computer required, time saving, and immediate response[6,8,10].

The following drawbacks have also been reported: increasing workload by staying online 24 h a day, disparity in the sense of urgency, clinical information not being included in medical records, issues of privacy and data protection, and absence of specific legislation[11].

It is usual that the demands placed on people by the changes in modern life and the need to adjust to these changes end up inducing emotional destabilization. Stress emerges as a consequence of persistent efforts to adapt to the existential situation[12]. The association between smartphone use and increased stress was suggested by a previous study[13].

Psychological distress has become a major mental health problem[14]. Depression could result in low productivity, absenteeism, and economic costs, whereas anxiety is frequently accompanied by headache, fatigue, or exhaustion[14]. Additionally, psychological distress among doctors impairs the safety of patients[15].

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The goal of the present study was to evaluate the use of messaging apps as a stressor affecting the well-being of gynecologists and obstetricians who use this tool to communicate with patients.

METHODS

We conducted a cross-sectional study between August 2019 and July 2020, approved by the Research Ethics Committee of the ABC Foundation School of Medicine. The population sample consisted of gynecologists and obstetricians selected by convenience. The professionals were personally invited to a regional meeting, and all agreed to participate in the study.

The inclusion criteria were as follows: Brazilian gynecologists and obstetricians, who used WhatsApp to communicate with patients, and agreement to participate in the study according to the informed consent form.

Participants were divided into study groups according to the weekly time of WhatsApp use to communicate with patients: less than 2 h (GI), 2–5 h (GII), and more than 5 h (GIII). The categories were random since there is no consensus on what is excessive use of WhatsApp for the proposed purpose.

Sociodemographic data were collected and the physicians answered three instruments in a self-administered manner: techno-stress questionnaire, WhatsApp Stress Scale (WASS), and Oldenburg Burnout Inventory (OLBI)[16-18].

Participants answered the following questionnaires:

1. Sociodemographic questionnaire.
2. WASS: It is a questionnaire, created and validated by the authors of the present study, to measure how communication applications affect the well-being of gynecologists and obstetricians who use this tool to communicate with patients. The nine items were measured by a 5-point Likert scale, with score averages ranging from 1–5[17].
3. OLBI: It is a standardized questionnaire, validated in Brazilian Portuguese in 2018, consisting of 13 assertions to measure Burnout in two dimensions, namely, emotional exhaustion and disengagement. All dependent variables were measured using a 4-point Likert scale, with score averages ranging from 1–4[18].
4. Techno-stress questionnaire: It is a standardized questionnaire consisting of 11 assertions to measure techno-stress in two dimensions, namely, techno-stress creators and techno-stress inhibitors. We used four domains, i.e., techno-overload, techno-invasion, techno-complexity, and job satisfaction. All dependent variables were measured using a 5-point Likert scale, with score averages ranging from 1–5[16].

The data were tabulated in Microsoft Excel 2003. The IBM-SPSS for Windows software version 20.0 (IBM Corp, Chicago, IL, USA) was used for analysis.

The normality of the data was analyzed using the Kolmogorov-Smirnov test. Analysis of variance (ANOVA) and the Bonferroni test were used to compare continuous variables. The chi-squared test and the likelihood ratio test were used to compare categorical variables.

The scores' questionnaires were analyzed by the mean. The variables worded positively were inverted, thus characterizing that the higher the mean, the higher stress perceived by WASS, and the higher burnout and techno-stress levels.

Statistical tests were two-tailed, with a significance level of 5%.

RESULTS

We included 138 physicians, divided into the three study groups according to the weekly WhatsApp usage time for communication with patients: less than 2 h (GI, n=86), 2–5 h (GII, n=29), and more than 5 h (GIII, n=23).

The mean age of the participants in GI, GII, and GIII was 46.6±13.2, 46.1±12.2, and 41.9±6.8 years, respectively (p=0.249). More than half of the doctors self-identified as female in all groups (p=0.234). All groups had a greater proportion of cohabiting people (p=0.091), persons with at least one child (p=0.633), and persons living in São Paulo city and neighborhood (p=0.548). Most participants in all groups had been working for more than 15 years as a doctor (p=0.599). The professionals who had more office work activity (p=0.019) and who worked more hours a week (p=0.048) communicated more with patients via WhatsApp.

Demographic data are described in Table 1.

Table 2 shows the scores' questionnaires in the groups studied. Doctors who spent more hours communicating with patients via WhatsApp had higher levels of stress perceived by WASS (p=0.010) and emotional exhaustion (Burnout) (p<0.001).

Techno-overload and techno-invasion were related to longer WhatsApp usage time to communicate with patients (p<0.001). Techno-complexity and job satisfaction did not differ between groups. The vast majority of the physicians reported being satisfied with their work (p=0.932). When adjusted for the workload and office work of study participants, the results were similar.

When answering WASS, 74% of the doctors reported frequently answering messages not related to urgent matters, while 78% reported feeling insecure due to the lack of specific regulations related to the use of WhatsApp to communicate with patients. About 82% of professionals believed that this type of

Table 1. Sociodemographic characteristics.

	WhatsApp Group			p-value
	<2 h/week (n=86)	2–5 h/week (n=29)	>5 h/week (n=23)	
Age (years)				
Mean±DP	46.6±13.2	46.1±12.2	41.9±6.8	0.249*
Gender, n (%)				
Female	49 (57)	20 (69)	17 (73.9)	0.234
Male	37 (43)	9 (31)	6 (26.1)	
Marital Status, n (%)				
Single	30 (34.9)	8 (27.6)	9 (39.1)	0.091#
Married	49 (57)	21 (72.4)	14 (60.9)	
Cohabitation	7 (8.1)	0 (0)	0 (0)	
Children, n (%)				
Yes	55 (64)	21 (72.4)	14 (60.9)	0.633
No	31 (36)	8 (27.6)	9 (39.1)	
Residence, n (%)				
São Paulo city and neighborhood	84 (97.7)	28 (96.6)	22 (95.7)	0.548#
Interior of São Paulo	1 (1.2)	0 (0)	1 (4.3)	
Other states	1 (1.2)	1 (3.4)	0 (0)	
Graduate year, n (%)				
1–15 years	29 (33.7)	7 (24.1)	8 (34.8)	0.599
>15 years	58 (66.3)	22 (75.9)	7 (65.2)	
Smoking, n (%)				
Yes	5 (5.8)	1 (3.4)	0 (0)	0.285#
No	81 (94.2)	28 (96.6)	23 (100)	
Alcoholism, n (%)				
Yes	4 (4.7)	3 (10.3)	0 (0)	0.155#
No	82 (95.3)	26 (89.7)	23 (100)	
Physical activity, n (%)				
Yes	49 (57)	15 (51.7)	15 (65.2)	0.618
No	37 (43)	14 (48.3)	8 (34.8)	
Weekly workload, n (%)				
<20 h	2 (2.3)	1 (3.4)	2 (8.7)	0.048#
20–30 h	5 (5.8)	4 (13.8)	0 (0)	
31–40 h	27 (31.4)	8 (27.6)	2 (8.7)	
41–60 h	40 (46.5)	13 (44.8)	11 (47.8)	
>60 h	12 (14)	3 (10.3)	8 (34.8)	
Work-duty activity, n (%)				
Yes	35 (40.7)	11 (37.9)	6 (26.1)	0.438
No	51 (59.3)	18 (62.1)	17 (73.9)	
Office work activity, n (%)				
Yes	74 (86)	28 (96.6)	23 (100)	0.019#
No	12 (14)	1 (3.4)	0 (0)	
Work-surgery activity, n (%)				
Yes	45 (52.3)	20 (69)	16 (69.6)	0.148
No	41 (47.7)	9 (31)	7 (30.4)	
Academic activity, n (%)				
Yes	31 (36)	11 (37.9)	8 (34.8)	0.971
No	55 (64)	18 (62.1)	15 (65.2)	

Test: χ^2; #Likelihood ratio test; *ANOVA.

communication trivializes the medical service, while 73% had already felt annoyed by the lack of remuneration when working through the tool.

Table 3 compares scores that differed between groups. The stress score was higher in GIII than in GI (p=0.008). Emotional exhaustion and techno-overload were higher in GIII than in GI and GII (p<0.05). Techno-invasion was higher in GIII than in GI and GII, and higher in GII than in GI (p<0.05).

DISCUSSION

The key finding of this study was that the high WhatsApp usage for communication with patients can cause doctor's Burnout and stress. Given that the physicians who worked the most hours per week communicated the most with patients through messaging apps, the high rates of stress and Burnout can be attributed, among other factors, to workload. After all, they added working time to an already exhausting routine peculiar to the gynecology setting.

Hours worked per week as a factor independently associated with Burnout is confirmed by the report by Dyrbye for a sample of 7,905 surgeons[19]. Although the WhatsApp usage is due to the perception of numerous advantages reported in clinical practice, increasing the efficiency of doctor-patient communication, it enables online availability 24 h a day, 7 days a week, significantly increasing working hours.

A study conducted in the USA linked long hours worked to sleep disturbances, fatigue, stress, negative mood, and decrements in functioning[20]. In other words, being available professionally for hours at a time can bring undeniable damage to the physician's health.

In our study, techno-invasion and techno-overload were associated with the high WhatsApp usage for communication

Table 3. Bonferroni multiple comparisons.

	Comparison	MD	p-value	95%CI	
				Inferior	Superior
WASS Total score	GI–GII	-0.09	>0.999	-0.53	0.36
	GI–GIII	-0.62	0.008	-1.10	-0.13
	GII–GIII	-0.53	0.083	-1.11	0.05
Burnout Emotional exhaustion	GI–GII	-0.19	0.617	-0.56	0.17
	GI–GIII	-1.12	<0.001	-1.52	-0.72
	GII–GIII	-0.92	<0.001	-1.40	-0.45
Techno-stress Techno-overload	GI–GII	-0.38	0.270	-0.91	0.16
	GI–GIII	-1.26	<0.001	-1.84	-0.68
	GII–GIII	-0.88	0.007	-1.58	-0.19
Techno-stress Techno-invasion	GI–GII	-0.63	0.012	-1.15	-0.11
	GI–GIII	-1.86	<0.001	-2.43	-1.29
	GII–GIII	-1.23	<0.001	-1.91	-0.55

MD: mean difference; CI: confidence interval; WASS: WhatsApp Stress Scale.

Table 2. Questionnaires' descriptions by groups.

	WhatsApp Group			p-value	p¢
	<2 h/week (n=86)	2–5 h/week (n=29)	>5 h/week (n=23)		
WASS Questionnaire					
Mean±DP	3.43±0.92	3.52±0.8	4.05±0.62	0.010*	0.006
Burnout Questionnaire Score emotional exhaustion					
Mean±DP	2.24±0.73	2.43±0.75	3.36±0.52	<0.001*	<0.001
Score disengagement					
Mean±DP	2.13±0.69	2.15±0.71	2.32±0.8	0.536*	0.581
Technological stress questionnaire Techno-overload					
Mean±DP	2.67±1.04	3.05±1.1	3.93±0.85	<0.001*	<0.001
Techno-invasion					
Mean±DP	2.78±1.09	3.41±1.04	4.64±0.39	<0.001*	<0.001
Techno-complexity					
Mean±DP	2.42±0.96	2.64±1.11	2.44±1.14	0.593*	0.849
Job satisfaction					
Mean±DP	4.34±0.7	4.31±0.9	4.39±0.84	0.932*	0.953

Test: χ^2; *ANOVA; ¢Value adjusted for the workload and office work activity.

with patients. Consistent with our results, Waizenegger suggested that techno-overload (constant connectivity) leads to techno-invasion, an important cause of workers' techno-stress[21].

Besides their negative impact on individuals' quality of life, stress and Burnout may also affect the quality of care delivered to patients, which is deeply worrying. A previous study showed that emotional exhaustion was associated with adverse outcomes in patient care and worsening physician-patient relationship[22].

The majority of the participants in our study reported being satisfied with their work. The longer time using WhatsApp to communicate with patients, which was related to higher levels of stress, could negatively influence the professional's satisfaction, a situation not demonstrated. The medical literature described a direct association between stress and Burnout and low job satisfaction[22].

Approximately 73% of the physicians exhibited a concern about electronic communication not being reimbursed. While technology-mediated consultation is a medical act, it is important to define reimbursement strategies to make it financially sustainable. Many physicians in our study reported the feeling that the virtual environment can trivialize the medical service, which has been pointed out earlier as a major disadvantage of the use of WhatsApp in doctor-patient communication[9,11].

As a result of the novelty of this form of physician-patient communication, physicians do not have a lot of experience in dealing with online ethical, legal, and privacy dilemmas. Doctors in the present study reported the concern about online ethical, legal, and privacy dilemmas, which is consistent with a Lebanese study that has shown that 80% of surveys' doctors responders felt virtual communication can result in medico-legal issues[23].

Many issues related to the use of instant messages in doctor-patient communication can influence the quality of life of physicians. The need to adapt to this technology, which became part of clinical practice practically overnight, generates anxiety and stress, which is associated with negative consequences on patient care.

Limitations of the study include a convenience sample and questionnaire distribution being practically limited to the state of São Paulo, which significantly limits the generalizability of the study. Besides, stress and Burnout are multifactorial, and the factors were not fully addressed. Nevertheless, our results provide information that could help in the development of policies and strategies that will result in a better online physician-patient communication and make this form of communication less stressful for physicians.

CONCLUSIONS

The use of messaging apps via a smartphone was a stressor for gynecologists and obstetricians who routinely use this tool to communicate with patients. This results in a serious problem for gynecologists' and obstetricians' quality of life and represents a potential risk to the quality of medical care provided by them.

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AUTHORS' CONTRIBUTION

MGV: Conceptualization, Data curation, Writing – original draft, Writing – review & editing. **RTF:** Conceptualization, Data curation, Writing – original draft, Writing – review & editing. **GDT:** Conceptualization, Data curation, Writing – original draft, Writing – review & editing. **DIGC:** Formal Analysis. **CEF:** Writing – review & editing. **EO:** Formal Analysis.

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