Burden Associated with Telephone Calls on COVID-19

Results of a Flash Mob Study in Family Practices

Belastung durch Telefonanrufe zu COVID-19

Ergebnisse einer Flashmob-Studie in Hausarztpraxen

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Background
Family practices are the primary contact for inquiries relating to COVID-19. This study reveals the reasons why German family practices are called during the pandemic and which burden is associated with patients' inquiries related to COVID-19 among practice assistants (PAs).

Methods
On April 28, 2021 a cross-sectional flash mob study was conducted in family practices across Germany. The study material and invitation were disseminated via social media and postal or electronic mails. During half a day, participating practices counted every incoming call. For calls addressing COVID-19, the reason, duration, and perceived stress level were documented. Descriptive statistics and regression analyses were performed using SPSS.

Results
5,646 calls, 1,826 of which were related to COVID-19 (32.3 %), were documented by 73 practices (practice average: 25.0 ± 17.7) within a single Wednesday morning. Most calls addressed vaccination (n = 1,050, 59.0 %). During 22.0 % (n = 388) of COVID-19-related calls, PAs felt stressed, which was mainly influenced by the call duration (calls of 5 minutes and longer were perceived significantly more stressful [OR 8.94, 95 % CI 6.47–12.37]). Feeling well-prepared to meet patients' inquiries relating to COVID-19 was a protective factor for the average stress perceived per PA. Overall, less than 10 % of calls on COVID-19 were transferred to a physician.

Conclusions
Family practice teams experience a high volume of partly stressful phone calls about COVID-19 but are often able to handle the pandemic challenges. PAs play a central role in advising the practice population on issues related to COVID-19. This deserves greater recognition.

Keywords
COVID-19; telephone calls; practice assistant; flash mob study; family medicine

Hintergrund
Hausarztpraxen sind für viele Patient*innen die erste Anlaufstelle bei Fragen zu COVID-19. Diese Studie untersucht, wie hoch die telefonische Inanspruchnahme ist und welche Belastungen damit insbesondere für Medizinische Fachangestellte (MFA) verbunden sind.

Methoden
Am Vormittag des 28.04.2021 wurde eine Querschnittstudie im Flashmob-Design durchgeführt. Die Einladung und Unterlagen zur Teilnahme wurden vorab über verschiedene Kommunikationskanäle wie u.a. E-Mail-Verteiler, soziale Medien, Presse und eine Studienhomepage verbreitet. Pro Praxis wurden am Erhebungstag vormittags alle eingehenden Anrufe gezählt und für jeden Anruf zu COVID-19 ein Erhebungsbogen zu Beratungsanlass, Beratungsergebnis, Beratungsdauer und der mit dem Gespräch assoziierten Belastung ausgefüllt. Die Auswertung erfolgt mittels deskriptiver Statistiken und Regressionsanalysen in SPSS.

Ergebnisse
An einem Mittwochvormittag wurden in 73 Hausarztpraxen 5646 eingehende Anrufe dokumentiert, von denen 1826 (32,3 %) zu COVID-19 waren (Praxismittelwert: 25,0 ± 17,7). Die meisten dieser Anrufe adressierten das Thema Impfung (n = 1050, 59,0 %) und für 22,0 % (n = 388) gaben MFA an, dass sie sich durch das Telefonat gestresst fühlten, was insbesondere von der Dauer des Telefonats abhing. So wurden Anrufe mit einer Dauer von 5 Minuten und länger als signifikant stressiger empfunden (OR 8,94, 95%-KI 6,47–12,37). Das Gefühl, gut auf Patient*innen-Anfragen zu COVID-19 vorbereitet zu sein, war hingegen ein Schutzfaktor gegen Stress. Insgesamt wurden mehr als 90 % der Anrufe zu COVID-19 eigenständig durch die MFA abgehandelt.

Schlussfolgerungen
Hausarztpraxisteams erfahren in der Pandemie eine große Anzahl telefonischer Anfragen. Obgleich diese Anrufe teilweise Stress verursachen, scheinen die Praxen mit den Herausforderungen der Pandemie im Allgemeinen gut umgehen zu können. Damit übernehmen MFA eine Schlüsselrolle in der Beratung der Bevölkerung, was größerer Anerkennung bedarf.

Schlüsselwörter
COVID-19; Telefonanrufe; Medizinische Fachangestellte; Flashmob-Studie, Allgemeinmedizin

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Background

International comparisons show that German primary care physicians experience the highest amount of patient contacts per week by far [1, 2]. Especially family practices represent the primary contact for many patients for any health-related concerns. Due to this and enhanced by German public authorities, who officially referred the population to their family practice for any questions related to COVID-19, the SARS-CoV-2 pandemic has a major impact on the workload and wellbeing of family practice teams [3, 4].

Irrespective of the pandemic, recruitment of family practices for research activities is a challenge, but might be facilitated when physicians feel recognized during the research process, consider a study relevant, and notice that it requires little extra time [5]. Thus, we discussed with family practice teams on how studies need to be designed to make research during the pandemic feasible. In addition to the facilitators described [5], they stated that studies need to be conducted during a short time period as particularly physician assistants (PA), who typically coordinate studies within the practice, face a high workload. Practice teams reported that especially the work spectrum of PAs at the practices' reception desks changed from predominantly allocating appointments to providing telephonic consulting services. Underlining these experiences, a cross-sectional survey conducted during the early phase of the COVID-19 pandemic among more than 2,000 PAs in German family practices suggested that PAs experience high stress due to the demands associated with the pandemic. They reported feeling uncertain about sharing information about COVID-19, whether they behave correctly in the current situation, and whether patients feel well cared for [3].

Even though it is known that family practices face a great amount of inquiries during the pandemic, data demonstrating the actual workload and frequency of telephone requests, the issues addressed by patients, and the stress associated with patients' inquiries are lacking. We therefore aimed to assess these topics among PAs working in family practices. To minimize the extra workload, a so-called flash mob approach was used [6]. As we tested the flash mob design for the first time, the study also aimed to gain experiences with this design.

Methods

This article is structured according to the STROBE statement [7].

Study design and setting

A cross-sectional flash mob study was conducted, meaning that data on a specific topic is collected with a large sample during a short period of time [6]. Previous studies have shown that it is a valuable approach to investigate a relatively simple clinical question in an inexpensive, quick, and reliable way [6, 8, 9].

Our flash mob study on phone calls related to COVID-19 in German family practices was conducted during the practices consulting time in the morning of April 28, 2021. This date was chosen for practical reasons as it was outside holidays at the middle of the week. On this day, 7-day incidence of COVID-19 was 161 per 100,000 residents nationwide and 178 per 100,000 residents in North Rhine-Westphalia [10], the region in which the study was mainly conducted. Of 29,858 COVID-19 cases requiring medical care nationwide, 5,047 were in intensive care leading to 89 % ICU bed occupancy [10]. The incidences > 100 and the hospitalization rates were met with a nationwide emergency brake including a restriction of private contacts, night-time curfews, home schooling, and in-house service restrictions for locations as restaurants and bars [11]. At this time, a total of 23.4 % of the population had received one dose of SARS-CoV-2 vaccine, only 7.4 % had received two doses [10]. A high vaccination rate was not only linked to protection from COVID-19, but also to an end of national emergency brake, which resulted in a high demand for vaccinations. After official roll out of vaccination against SARS-CoV-2 at the end of 2020, vaccination was predominantly provided in vaccination centers applying a prioritized procedure graded by age, morbidity, and occupation [12]. Starting from April 2021 vaccination was also provided by family practices [10, 12, 13], having a notable impact on vaccination progress: on April 28, 2021 alone, more than one million doses of SARS-CoV-2 vaccine were provided [12].

Participants and recruitment

For recruitment of German family practices a pragmatic approach with two paths was followed:

First, a written invitation and all study materials required for participation were sent to all teaching and research practices associated with the Institute of General Practice and Primary Care, Witten/Herdecke University via post.

Second, the study was promoted via several multipliers and communication channels, e.g. email lists of the Institutes of General Practice Bochum, Düsseldorf, Cologne and Duisburg-Essen, email list, homepage, and newsletter of the German College of General Practitioners and Family Physicians, homepage of the Association of General Practitioners, Westphalia-Lippe, and a study homepage (www.flashmobstudie.de). Practices interested in participation, who did not receive the study materials automatically via post, could download the materials from the study homepage or request them in order to get it via post or email.

As data were collected anonymously, written consent was not necessary. The study was approved by the Ethics Committee of Witten/Herdecke University (308/2020; 27.03.2021).

Variables and data sources

All data were collected using paper-based questionnaires:

1. Tally sheet, on which PAs counted any incoming calls during the data collection period.
2. Documentation sheet for calls on COVID-19, which was filled by PAs answering the phone for all calls related to COVID-19. It provided information about the conversation: person calling (patient him-/herself, relative of a patient, nursing service/home, other), person is/was infected with SARS-CoV-2, person reports symptoms indicating a SARS-CoV-2 infection, issue addressed during the call, call duration, call transferred to physician, subjective stress level associated with the call (6 point Likert scale from not stressed at all to very stressed).

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3. Brief questionnaire on socio-demographic characteristics answered by every PA who supported the study.
4. Brief questionnaire on practice characteristics completed by one physician of each participating practice.

Family physicians and PAs were involved in the development of the study documents. In order to increase practices' response, the study conduct and documents were kept simple. The feasibility of the materials and the study conduct was pre-tested in four practices.

Statistical methods

Descriptive statistics were performed. For categorical variables percentages are reported, for continuous variables the mean value, standard deviation (SD), minimum (min), and maximum (max) are reported, respectively. All percentages and mean values refer to valid cases.

In order to determine factors that influenced the stress level associated with calls on COVID-19, a multivariate logistic regression analysis was performed. For this, the stress level was dichotomized into low and high. To select independent variables, characteristics of calls were compared between calls experienced as stressful and those experienced as not stressful using Pearson's chi-squared test (Fisher's exact test if cells were < 5) with a nominal significance level of $p < 0.05$. Only those showing significant differences were included as independent variables. The results are reported as Odds Ratio (OR) with 95 % confidence interval (95 % CI).

Additionally, the average stress level due to telephone inquiries per PA was determined based on the documentation sheets on calls related to COVID-19 they filled. To identify factors that influenced the individual stress level, a multiple linear regression was performed with the mean stress level per PA as dependent variable. In order to minimize suppressor effects, independent variables were selected using backward selection. The standardized regression coefficients with corresponding 95 % CI are reported.

All analyses were performed using SPSS, Version 26.

a) Practice characteristics (N = 73)				
	N			**n (%)**
Practice type	67		Solo practice	27 (40.3)
			Group practice	32 (47.8)
			Practice community	6 (9.0)
			Pan-regional group practice	2 (3.0)
Practice region	67		< 2,000 inhabitants	1 (1.5)
			2,000–5,000 inhabitants	6 (9.0)
			5,000–20,000 inhabitants	20 (29.9)
			20,000–100,000 inhabitants	21 (31.3)
			> 100,000 inhabitants	19 (28.4)
Number of practice assistants working in the practice	69		1–2	6 (8.7)
			3–5	38 (55.1)
			> 5	25 (36.2)
Number of physicians working in the practice	68		1–2	43 (63.2)
			3–5	24 (35.3)
			> 5	1 (1.5)
Patients per practice per quarter	68		< 1,000	4 (5.9)
			1,000–2,000	40 (58.8)
			> 2,000	24 (35.3)
Separate telephone line for receipts/referrals	69		Yes	34 (49.3)
			No	35 (50.7)
	N		**average ± SD (min-max)**	
Total number of telephone inquiries	73		77.3 ± 36.3 (17–238)	
b) Characteristics of the participating practice assistants (N = 128)				
	N			**n (%)**
Sex	128		Female	126 (98.4)
			Male	2 (1.6)
Employment status	127		Part-time	63 (49.6)
			Fulltime	64 (50.4)
	N		**average ± SD (min-max)**	
Age, in years	128		41.0 ± 12.9 (18–64)	
Years in job	116		19.9 ± 13.0 (1–46)	
Telephone calls related to COVID-19 answered	128		13.8 ± 11.9 (1–75)	

Table 1 Study characteristics

Results

Response

73 practices participated in the study. Response was highest among those that actively requested the study materials with 22 of 46 practices (47.8 %) finally supporting the study. Of those 154 practices, who automatically received the study materials via post, 29 participated (18.8 %). The remaining 22 participating practices downloaded the material from the study homepage. For this recruitment path there is no information on the response as the number of unique downloads is unknown.

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	N		average ± SD (min-max)
Inquiries related to COVID-19 per practice	73		25.0 ± 17.7 (1–90)

	N		n (%)
Person calling (multiple responses)	1.739	Patient him-/herself	1,404 (80.7)
		Relative of a patient	270 (15.5)
		Nursing service/home	42 (2.4)
		Other	34 (2.0)
Person is or was infected with SARS-CoV-2	1.745	Yes	113 (6.5)
		No	1,632 (93.5)
Person reports symptoms indicating a SARS-CoV-2 infection	1.716	Yes	199 (11.6)
		No	1,517 (88.4)
Issue addressed by the patient (multiple response)	1.779	Vaccination	1,050 (59.0)
		Appointment request	515 (28.9)
		SARS-CoV-2 testing	236 (13.3)
		Medical certificate	168 (9.4)
		Treatment	88 (4.9)
		Quarantine rules, conduct towards contact persons	84 (4.7)
		Sick leave	62 (3.5)
		Other	261 (14.7)
Duration of the conversation	1.777	< 2 minutes	758 (42.7)
		2–5 minutes	798 (44.9)
		5–10 minutes	197 (11.1)
		> 10 minutes	24 (1.4)
Call transferred to physician	1.745	Yes	149 (8.5)
		No	1,596 (91.5)
Feeling during the conversation	1.763	Very stressed	65 (3.7)
		stressed	122 (6.9)
		Rather stressed	201 (11.4)
		Rather not stressed	268 (15.2)
		Not stressed	381 (21.6)
		Not stressed at all	726 (41.2)

Table 2 Details on telephone inquiries related to COVID-19 (n = 1,826 calls)

Study characteristics

The majority of the 73 practices were group practices (n = 32, 47.8 %) and single practices (n = 27, 40.3 %) (Tab. 1a). The practice teams most commonly consisted of one to two physicians (n = 43, 63.2 %) and three to five PAs (n = 38, 55.1 %). Within these practices 128 PAs answered the phone and documented the incoming calls. On average, each of them answered 13.8 phone calls related to COVID-19 (SD: 11.9) within a half day. For characteristics of PAs see Table 1b.

Nearly all PAs reported increased telephone traffic since the beginning of the pandemic (n = 124, 97.6 %). Most of them felt sufficiently informed and prepared to answer the patients' inquiries related to COVID-19 (n = 103, 81.1 %), but commonly experienced those inquiries as more stressful than other inquiries (n = 93, 73.2 %).

Telephone calls

In total, 5,646 telephone calls were documented by the 73 practices within half a day, of which 1,826 (32.3 %) addressed issues related to COVID-19 (Tab. 2). Most of these inquiries addressed vaccination (n = 1,050, 59.0 %) and took two to five minutes (n = 798, 44.9 %). Less than 10 % of the calls (n = 149) were transferred to a physician.

Stress associated with calls on COVID-19

In one fifth of all calls related to COVID-19, PAs felt rather stressed to very stressed (n = 388, 22.0 %). The multivariate regression revealed that a call duration of ≥ 5 minutes was the main predictor for whether a phone call was perceived stressful or not (OR 8.94, 95 % CI 6.47–12.37) (Tab. 3a). Nagelkerke's R^2 was 0.194 (medium goodness-of-fit [14]).

The average stress level perceived per PA during calls on COVID-19 was 2.2 (SD: 1.1) on a 6-point Likert scale. According to the results of the multiple linear regression (Tab. 3b), the PAs' perceived average overall stress level was significantly lower when they felt sufficiently informed about COVID-19 and prepared to answers the patients' requests. Corrected R^2 for the overall model was 0.103 (small to medium goodness-of-fit [14]).

Discussion

One third of all phone calls documented in family practices within half a day were related to COVID-19. Focusing on these calls only, most of them addressed vaccination and one fifth of the inquiries were perceived as stressful by the PAs answering the phone. A call duration of at least five minutes was the main predictor for feeling stressed during a call. Overall, PAs who felt adequately informed and prepared to answer patients' questions on COVID-19 were found to feel significantly less stressed.

Indeed, the majority of PAs (81.1 %) felt sufficiently informed and prepared for the patients' inquiries, which was an increase compared to a survey conducted among more than 2,000 PAs during the early phase of the pandemic in April 2020 revealing that two thirds felt sufficiently informed and

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a) Multivariate logistic regression*: Factors influencing the stress level during a phone call on COVID-19 (n=1,660 calls)

Independent variable	OR	95% CI	p-value
Duration ≥ 5 minutes	8.94	6.47–12.37	< 0.001
Inquiry: treatment of COVID-19	1.80	1.05–3.06	0.031
Inquiry: medical certificate	1.57	1.05–2.33	0.027
Call transferred to physician	1.27	0.82–1.94	0.283
Person calling: relative of a patient	1.24	0.66–2.34	0.497
Inquiry: SARS-CoV-2 testing	1.19	0.82–1.70	0.343
Person calling: patient him-/herself	0.86	0.48–1.54	0.612

b) Multiple linear regression**: Factors influencing the average overall stress level of practice assistants (n = 126 practice assistants)

Independent variable	Standardized Beta	95 % CI	p-value
I feel sufficiently informed and prepared to answer patients' inquiries during the pandemic (continuous level of agreement)	-0.24	-0.41– -0.05	0.014
Since the beginning of the pandemic, the amount of telephone inquiries has increased (continuous level of agreement)	0.24	0.09–0.81	0.015
Urban practice region	0.17	-0.05–0.84	0.082

* The final model included independent variables significant in Pearson's chi-squared test
** The final model resulted from a backward selection of independent variables; variables excluded during this process were age in years, sex, employment status, years in job, number of phone calls on COVID-19 answered, total number of telephone requests documented in the practice, separate phone line for receipts/referrals, practice type (dichotomized to solo/group), number of practice assistants working in the practice, number of physicians working in the practice, patients per practice per quarter.

Table 3 Regression analyses on factors influencing the stress level

prepared [3]. This result indicates that family practice teams are highly professional and well organized to meet the pandemic challenges. However, in order to be informed and prepared they had to acquire new information themselves. As a consequence, the workload increased not only because of a higher volume of telephone calls and an increase in pandemic-related tasks like vaccination and testing, but also due to having to keep up-to-date to be well-prepared for the various inquiries.

The fact that feeling adequately informed and prepared was found to be a protective factor for stress may also explain why PAs did not feel stressed during the majority (78 %) of calls related to COVID-19. Based on these data PAs are able and willing to provide consulting services, which is also underlined by the fact that less than 10 % of calls were transferred to a physician. Even calls that were transferred did not have an impact on the perceived stress. Instead, calls with a longer duration and those relating to treatment of COVID-19 and addressing medical certificates were perceived as more stressful.

The duration might be explained by the fact that time capacity is limited during the pandemic, but also generally in daily practice. Inquiries that are perceived as more stressful than others might cause further tasks to be completed under time constraints.

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Foto: privat

Overall, the study demonstrates that family practice teams are faced with a high workload during the SARS-CoV-2 pandemic. However, they are able to handle the pandemic challenges by being well-prepared. PAs play a key role in this process and show extensive commitment. As it is known that a lack of appreciation potentially fosters dissatisfaction [15], and a previous study on workload during a pandemic revealed that family physicians and PAs felt not adequately recognized and compensated [16], a wider recognition of their work is indicated. On the one hand, more professionalization of PAs might result in a greater appreciation of their work and put them in a position where they can independently assume more aspects of patient care. On the other hand, there might be strategies to decrease the amount of inquiries during the pandemic and comparable future situations. Instead of officially referring patients to their family practices in case of any questions related to COVID-19, easily accessible and comprehensible information and advice might be disseminated by official entities. Even though practices

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are well-prepared, the data on perceived stress show that some PAs are able to deal better with a high volume of telephone inquiries and the consulting function associated with the patients' inquiries than others. Further training, sufficient space for sharing professional experiences, financial appreciation, and organizational support are necessary to adequately support PAs in executing this consulting function.

Strengths and limitations

The results of this study are limited due to potential selection bias. First, it cannot be excluded that practices that were less burdened are overrepresented in the sample. This bias is further enhanced as some practices responded that they were willing to participate, but did not have the capacity to document their workload at all. Additionally, the participating practices might be particularly motivated and thereby have more strongly prepared their PAs than other practices. Thus, the workload and the stress level of practice teams might be underestimated. Second, the study was promoted predominantly among practices in North-Rhine Westphalia. Third, data were collected only during half a day and telephone traffic might strongly depend on single events or differ on different days of a week. However, the sample was sufficient enough to gain insights into the workload of family practice teams during the pandemic.

Advantages of flash mob research are, for instance, the brevity of the recruitment period since a large number of subjects are included over a short time span (e.g., one day), that potential bias due to random effects emerging from this short period can be balanced by a large sample size, and that data are promptly available to the researchers meaning that analysis time can be kept short while costs are low. However, disadvantages can be seen in a limited number of research data that can be collected per study subject. This method is also only appropriate for popular and simple research topics, which can attract many participants in a short period of time [6].

Conclusions

Family practice teams experience a high volume of phone calls addressing issues related to COVID-19. Even though patients' inquiries are sometimes perceived as stressful, family practices are often able to handle the pandemic challenges. PAs in particular play a central role in this process of advising the population on issues related to CO-VID-19, which should be awarded greater recognition.

Conflict of interest statement:
The authors report no conflicts of interest.

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