The impact of the covid-19 pandemic on diabetes care: the perspective of healthcare providers across Europe

Grondelle, S.E. van; Bruggen, S. van; Rauh, S.P.; Zwan, M. van der; Cebrian, A.; Seidu, S.; ... ; Vos, R.C.

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The impact of the covid-19 pandemic on diabetes care: the perspective of healthcare providers across Europe

S.E. Van Grondelle [a,*], S. Van Bruggen [a,b], S.P. Rauh [a], M. Van der Zwan [a], A. Cebrian [c,d,e], S. Seidu [f], G.E.H.M. Rutten [g], H.M.M. Vos [a], M.E. Numans [a], R.C. Vos [a]

[a] Department of Public Health and Primary Care, Leiden University Medical Centre, Leiden, the Netherlands
[b] Hadoks, The Hague, the Netherlands
[c] Primary Care Research Group, Biomedical Research Institute of Murcia (IMIB), Murcia, Spain
[d] Centro de Salud Casco Antiguo Cartagena, Murcia, Spain
[e] Spanish Diabetes Association, Catholic University of Murcia, Servicio Murciano de Salud, Cartagena, Murcia, Spain
[f] Diabetes Research Centre, University of Leicester, Leicester, UK
[g] Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, the Netherlands

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ABSTRACT

Aims: Covid-19 caused changes on the delivery of diabetes care. This study aimed to explore perceptions of healthcare providers across Europe concerning 1) the impact of covid-19 on delivery of diabetes care; 2) impact of changes in diabetes care on experienced workload; 3) experiences with video consultation in diabetes care.
Methods: Cross-sectional survey among healthcare providers in the Netherlands, United Kingdom, Turkey, Ukraine and Sweden, with a focus on primary care.
Results: The survey was completed by 180 healthcare providers. During the COVID-19 pandemic 57.1% of respondents provided less diabetes care and 72.8% observed a negative impact on people with diabetes. More than half of respondents (61.9%) expressed worries to some extent about getting overloaded by work. Although the vast majority considered their work meaningful (85.6%). Almost half of healthcare providers (49.4%) thought that after the pandemic video-consultation could be blended with face-to-face contact.
Conclusions: Less diabetes care was delivered and a negative impact on people with diabetes was observed by healthcare providers. Despite healthcare providers' feeling overloaded, mental wellbeing seemed unaffected. Video consultations were seen as having potential. Given the remaining covid-19 risks and from the interest of proactive management of people with diabetes, these findings urge for further exploration of incorporating video consultation in diabetes care.

1. Introduction

CoronaVirus Disease 19 (covid-19) is a highly infectious disease that led to a global pandemic [1,2]. People with cardiometabolic chronic conditions like type 2 diabetes, are particularly vulnerable concerning covid-19 since they are at risk of more severe symptoms and a higher mortality [3–6].

In many European countries, diabetes care is increasingly delivered with regular proactive monitoring in primary care, integrated to a certain level with hospital facilities [7,8]. Standard primary diabetes care includes structural proactive monitoring of biomedical target indicators such as HbA1c, systolic blood pressure and LDL [9–12]. Furthermore, lifestyle counselling with regard to body weight, physical exercise and smoking behaviour constitutes an important part of treatment. Structural monitoring is associated with better HbA1c levels [13,14]. In contrast, in middle income countries such as Turkey and Ukraine, where historically a high diabetes-related mortality was observed [15], accessibility of services and treatment adherence is sub-optimal [16–18].

During the covid-19 pandemic, in many countries irrespectively of income level, a dramatic decline in routine diabetes consultations was observed [19,20]. The demands of covid-19 on laboratory facilities also led to a downscaled monitoring of cardiovascular risk parameters [21]. Additionally, across Europe, delivery of self-management support and

* Corresponding author.
E-mail address: s.e.van_grondelle@lumc.nl (S.E. Van Grondelle).

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Table 1
Characteristics of participants.

	The Netherlands	United Kingdom	Turkey	Ukraine	Sweden	Total sample
Total participants	n = 109	n = 24	n = 21	n = 14	n = 12	n = 180
Women, n (%)	96 (86.5)	20 (69.0)	6 (33.3)	1 (7.7)	4 (33.3)	127 (70.6)
Age in years, mean (SD)	49.2 (10.4)	48.8 (9.8)	32.7 (6.2)	46.3 (11.1)	53,9 (12.4)	49.2 (10.9)
Profession, n (%)						
primary care physician	38 (34.2)	13 (44.8)	9 (42.9)	1 (7.1)	12 (100,0)	73 (40.6)
hospital physician	0 (0.0)	0 (0,0)	3 (14.3)	13 (92.9)	0 (0,0)	16 (8.9)
nurse or nurse practitioner	68 (61.3)	15 (51.7)	0 (0,0)	0 (0,0)	0 (0,0)	101 (56.1)
other	5 (4.5)	1 (3.4)	9 (42.9)	0 (0,0)	0 (0,0)	15 (8.3)
Experience in years, mean (SD)	12.9 (8.1)	18.5 (11.7)	7.3 (5.7)	17.9 (9.7)	20.5 (14.2)	15.7 (9.4)
GP practice location, n (%)						
rural	22 (20.4)	8 (27.6)	0 (0,0)	0 (0,0)	1 (8.3)	31 (17.2)
urban, low SES	24 (22.2)	9 (31.0)	3 (16.7)	0 (0,0)	2 (16.7)	38 (21.1)
urban, middle SES	52 (48.1)	12 (41.4)	11 (61.1)	10 (76.9)	7 (58.3)	92 (51.1)
urban, high SES	10 (9.3)	0 (0,0)	4 (22.2)	3 (23.1)	2 (16.7)	19 (10.6)
Covid-19 + , n (%)	19 (18.1)	2 (8.3)	8 (53.5)	8 (66.7)	6 (50.0)	43 (23.9)
Covid-19 + family, n (%)	22 (21.0)	3 (12.5)	10 (66.7)	6 (50.0)	6 (50.0)	47 (26.1)

diabetes education decreased extremely [22], thus resulting in a higher risk of uncontrolled diabetes – and subsequently, a variety of acute and chronic microvascular and macrovascular complications [23].

The demands of covid-19 led to a high additional burden in hospital care [24] and among physicians in general [25–27]. Covid-related stress and burn-out were also reported among primary care providers such as general practitioners (GPs) [28] – which was associated with practice and staffing changes, and concerns about exposure to covid-19 [29]. Given the vulnerability of people with type 2 diabetes in the covid-19 era, the declined delivery of diabetes care might pose specific burdens on healthcare providers. Insight in the impact of covid-19 on the work-related stress and wellbeing of primary diabetes healthcare providers is lacking.

In response to these risks of disease deterioration, the use of telemedicine and remote facilities such as telephone consultations and SMS messages etcetera increased sharply [19,30]. Teleconsultation refers to communication that happens between a physician and a patient or between physician and physician for the purpose of providing diagnostic or therapeutic advice through electronic means[31]. Video-consultation is a form of telemedicine, where there is direct interaction between physician and patient, using synchronous video and sound facilities. The use of video consultation took a high rise as well, although evidence on clinical advantages of video consulting is mixed [32]. Nevertheless, a study among Norwegian GPs found that compared to face-to-face consultations, video consultations were rated at least equally suitable, or even better – for example to assess the main reason of contact, follow-up treatment for new health problems and mental problems, such as anxiety, life stress and depression [32].

Worldwide, recommendations are provided with regard to implementation of video consultation in daily practice [32,33]. However, little is known with regard to the experiences of healthcare providers concerning the use of video consultation in primary diabetes care. Therefore, this study aims to explore among primary diabetes care providers in European high- and middle-income countries the following themes: 1) the impact of covid-19 on delivery of diabetes care, 2) impact of changes in diabetes care on experienced workload and work-related stress among healthcare providers; 3) experiences of healthcare providers with video consultation in daily diabetes care.

2. Methods

2.1. Study design and participants

This study was designed as a cross-sectional survey among healthcare providers in the Netherlands, United Kingdom, Turkey, Ukraine and Sweden, with a focus on primary care. Between December 2020 and March 2021, the anonymous web-based survey was sent to GPs, nurse practitioners (NPs) and other healthcare providers who are involved in diabetes care. Healthcare providers in all countries were approached via the network of members of the Primary Care Diabetes Europe network. Healthcare providers were included if they provided diabetes care and had the ability to fill in the web-based survey. Informed consent of the healthcare providers was obtained at the beginning of the survey. The study protocol was approved by the Medical Ethics Review Committee Leiden-Den Haag-Delft (version CoCo 2020–062).

2.2. Study instrument

The survey, developed by a multidisciplinary expert team of experienced GPs, a behavioural scientist and epidemiologists, focussed on the following topics: the general impact of COVID-19 on patients and healthcare providers (5-category Likert scale), impact on the workload and work-related stress (4-catecory Likert scale), impact on the delivery of diabetes care (varying response options), experience with video-consultation (varying response options). The questionnaire started with questions on characteristics from participants (see supplementary table 1), such as age, work experience and practice location. For practice location we asked participants whether they worked in a neighbourhood with on average patients with a low, middle or high socio-economic status (SES), as low SES is associated with a higher incidence of type 2 diabetes [34].

Statistical analysis Data analyses were performed in Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics for categorical variables were expressed as n (%) and for continuous variables as mean ± standard deviation, as the continuous variables were normally distributed. Missing data were excluded from the analysis.

Table 2
Response time and amount of healthcare during the covid-19 pandemic.

	All	GP	Hospital Specialist	Nurse	Other
How fast could a diabetes related problem be answered compared to before the covid-19 pandemic? n (%)	n = 155	n= 62	n = 9	n = 73	n = 11
Faster	20 (12.9)	10 (16.1)	4 (44.4)	2 (2.7)	4 (36.4)
Equal	126 (81.3)	47 (75.8)	4 (44.4)	68 (93.2)	7 (63.6)
Slower	8 (5.2)	5 (8.1)	1 (11.1)	2 (2.7)	0 (0.0)
Unknown	1 (0.6)	0 (0.0)	0 (0.0)	1 (1.4)	0 (0.0)
Did the amount of healthcare for your type 2 diabetes patients decrease during the COVID-19 pandemic compared to before? n (%)	n = 161	n = 65	n = 10	n = 75	n = 11
Yes, less care to all	15 (9.3)	8 (12.3)	1 (10.0)	6 (8.0)	0 (0.0)
Yes, less care to some	77 (47.8)	35 (53.8)	2 (20.0)	36 (48.0)	4 (36.4)
Same amount of care	52 (32.3)	18 (27.7)	4 (40.0)	24 (32.0)	6 (54.5)
No, more care some	13 (8.1)	3 (4.6)	1 (10.0)	8 (10.7)	1 (9.1)
No, more care all	3 (1.9)	0 (0.0)	2 (20.0)	1 (1.3)	0 (0.0)
Unknown	1 (0.6)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)
How would you assess the impact of COVID-19 related changes in healthcare services on your patients with diabetes? n (%)	n = 162	n = 65	n = 10	n = 75	n = 12
Strongly positive	1 (0.6)	1 (1.5)	0 (0.0)	0 (0.0)	0 (0.0)
positive	10 (6.2)	2 (3.1)	0 (0.0)	6 (8.0)	2 (16.7)
No effect	22 (13.6)	7 (10.8)	6 (60.0)	9 (12.0)	0 (0.0)
negative	98 (60.5)	46 (70.8)	2 (20.0)	42 (56.0)	8 (66.7)
Strong negative	20 (12.3)	7 (10.8)	1 (10.0)	12 (16.0)	0 (0.0)
I do not know	11 (6.8)	2 (3.1)	1 (10.0)	6 (8.0)	2 (16.7)

For experiences with video consultations we asked healthcare providers how prepared they felt to perform video consultations on a scale of 1–10. We then divided healthcare providers into sufficiently prepared (answers 6–10) and insufficiently prepared (answers 1–5) and plotted bar charts to visualize differences between these two groups. To determine whether profession was associated with preparedness for video-consultation we used a linear regression model with the following independent variables based on hypothesis or literature to correct for other factors which might influence preparedness for video-consultation: 'profession', 'years of experience', 'GP practice location', 'profession', 'capability of patients to perform video consultation' and 'whether video-consultation could be a replacement for face-to-face contact'. Due to the focus on primary care we only included GPs and nurses in the model.

3. Results

3.1. Characteristics of the participants

The survey was completed by 109 Dutch, 24 British, 21 Turkish, 14 Ukraine, and 12 Swedish healthcare providers (Table 1). The majority (81.8%) of participants were women and the mean age was 49.2 (SD 10.9) years. Healthcare providers had a mean work experience of 15.7 (SD 9.4) years. In the Netherlands, United Kingdom and Sweden the survey was completed mostly by GPs and NPs. In Turkey the survey was completed by GPs and physician assistants. In Ukraine 92.9% was a hospital specialist. Of all healthcare providers 25.6% has had COVID-19 when completing the survey and 28% had a family member who has had COVID-19. Due to small numbers per country we focussed on the results of the survey in total and not per country.

3.2. Delivery of care during the covid-19 pandemic: Response time and amount of care

Most healthcare providers (82.9%) were able to reply on diabetes related questions in the same time frame compared to before the pandemic (Table 2). Notably, some of the healthcare providers, especially hospital specialists (44.4%), reported that they could answer a diabetes related question faster than before the pandemic. However, 47.8% of healthcare providers could provide less care to some, and 9.3% for all of their diabetes patients during the pandemic. Almost two out of three (60.5%) healthcare providers observed negative effects of the COVID-19 related changes on their diabetes patients and 12.3% a strong negative effect.

3.3. Workload and work-related stress during the COVID-19 pandemic

During the Covid-19 pandemic, almost 60% of healthcare providers experienced a higher workload; 29.4% a bit more work and 29.4% a lot more work (Fig. 1). The survey included some questions about symptoms related to burnout, such as concentration, feeling fit and sleep (Fig. 1b). Most of the healthcare providers responded that they could concentrate on work all of the time (84.4%) and felt fit all of the time (60.6%). Almost half of healthcare providers (45.6%) slept well. More than half of all healthcare providers worried about getting overloaded by work some of the time or all of the time (45.6% and 16.3%, respectively). Almost half (48.1%) of healthcare providers felt emotionally drained after a day of work some of the time and 19.4% reported that they felt emotionally drained all of the time. The majority of healthcare providers (85.6%) found their work meaningful most of the time during the covid-19 pandemic.

3.4. Experiences with video-consultation during the covid-19 pandemic

Most used care delivery method was still face-to-face contact (82.3%) and telephone consultations (82.0%). Other care delivery methods used were video consultations (24.1%), teleconsultation (18.4%), and other ways of communication (7.6%).

On average, healthcare providers felt sufficiently (6.0 (SD 2.8) on a scale of 0–10) prepared to use video consultation in an effective way. When comparing the healthcare providers who felt insufficiently (0–5, n = 63) prepared to use new diabetes care delivery methods to those who felt prepared, (6–10, n = 95), the latter mentioned they had access to good facilities for using video consultations, whereas the participants who rated themselves insufficient more often responded they did not know about the facilities (Fig. 2a, b). When asking healthcare providers about their experience on the capability of their patients to use video-consultation, healthcare providers who rated themselves sufficient, more often (52.2% vs 33.3%) reported that their patients were capable (acceptable or good) for this method. Besides, healthcare providers who rated themselves sufficient had a more positive experience with video-consultation and more often thought it could be a replacement for all (4.3%) or some (26.6%) face-to-face consultations, than healthcare providers who rated themselves insufficient (0% and 14.3%). Almost half of all healthcare providers indicated that after the pandemic video-consultation could be blended with face-to-face contact (49.4%). Being a GP seemed to be associated with a higher preparedness for video-consultation compared to nurses (Table 3), both in the crude model,

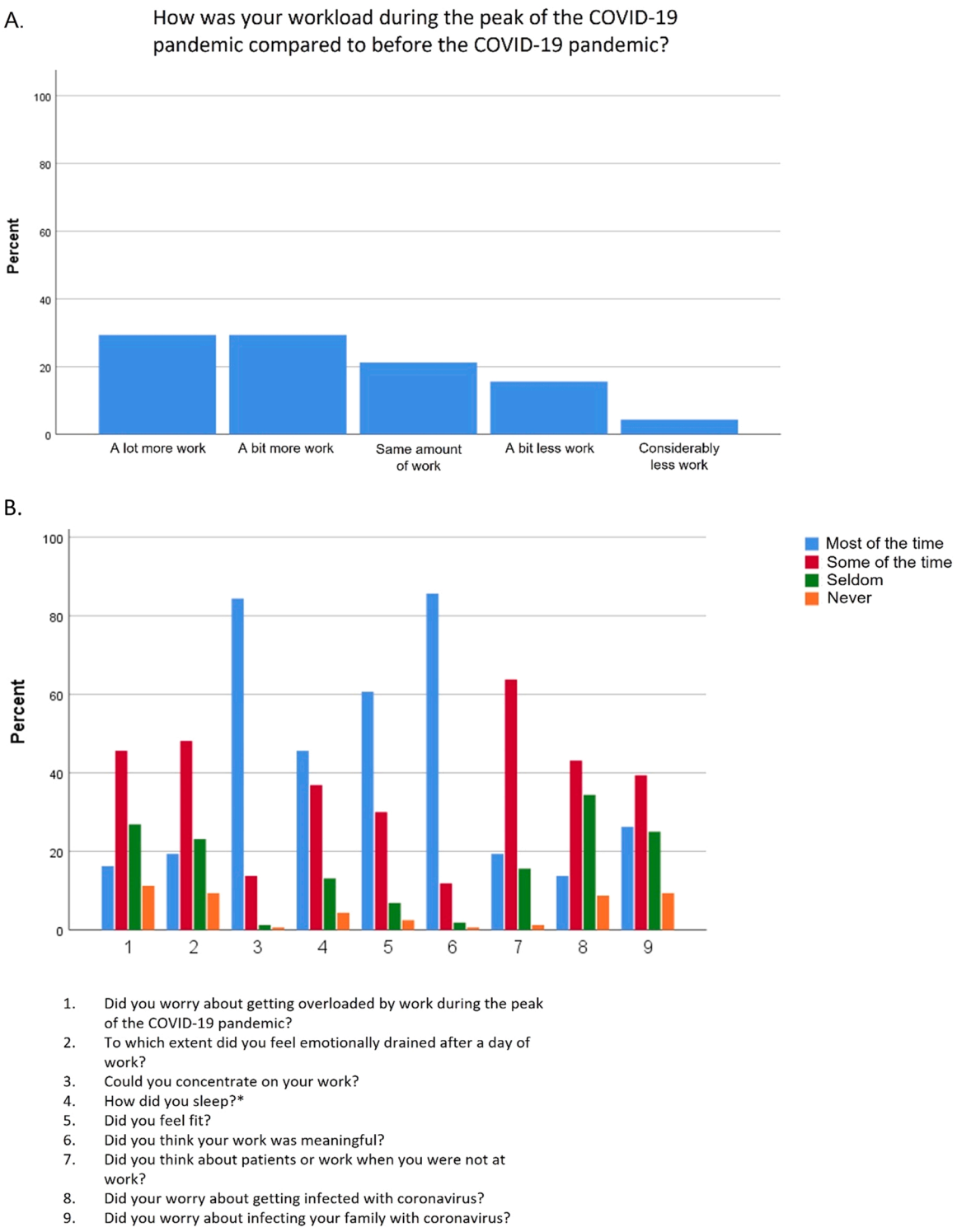

Fig. 1. a. Workload during the COVID-19 pandemic. b. Work-related stress during the covid-19 pandemic. *answer options: good, acceptable, poor, very poor.

as in the adjusted model. The other variables were not significantly associated with 'preparedness for video-consultation'.

4. Discussion

This study explored the experienced impact of the covid-19 pandemic among diabetes healthcare providers on 1) the delivery of diabetes care, 2) experienced workload and work-related stress and 3) experiences of healthcare providers with video consultation in daily diabetes care.

The majority of the respondents reported that the time frame with regard to answering diabetes-related questions had not changed, so reactive care to healthcare questions was not affected. Nevertheless, according to most respondents, less (pro-active) diabetes care could be provided and a negative impact on people with diabetes was perceived. Many respondents did not report problems related to concentration, sleep an physical fitness, but more than half of them indicated to some extent worries about getting overloaded and feeling emotionally

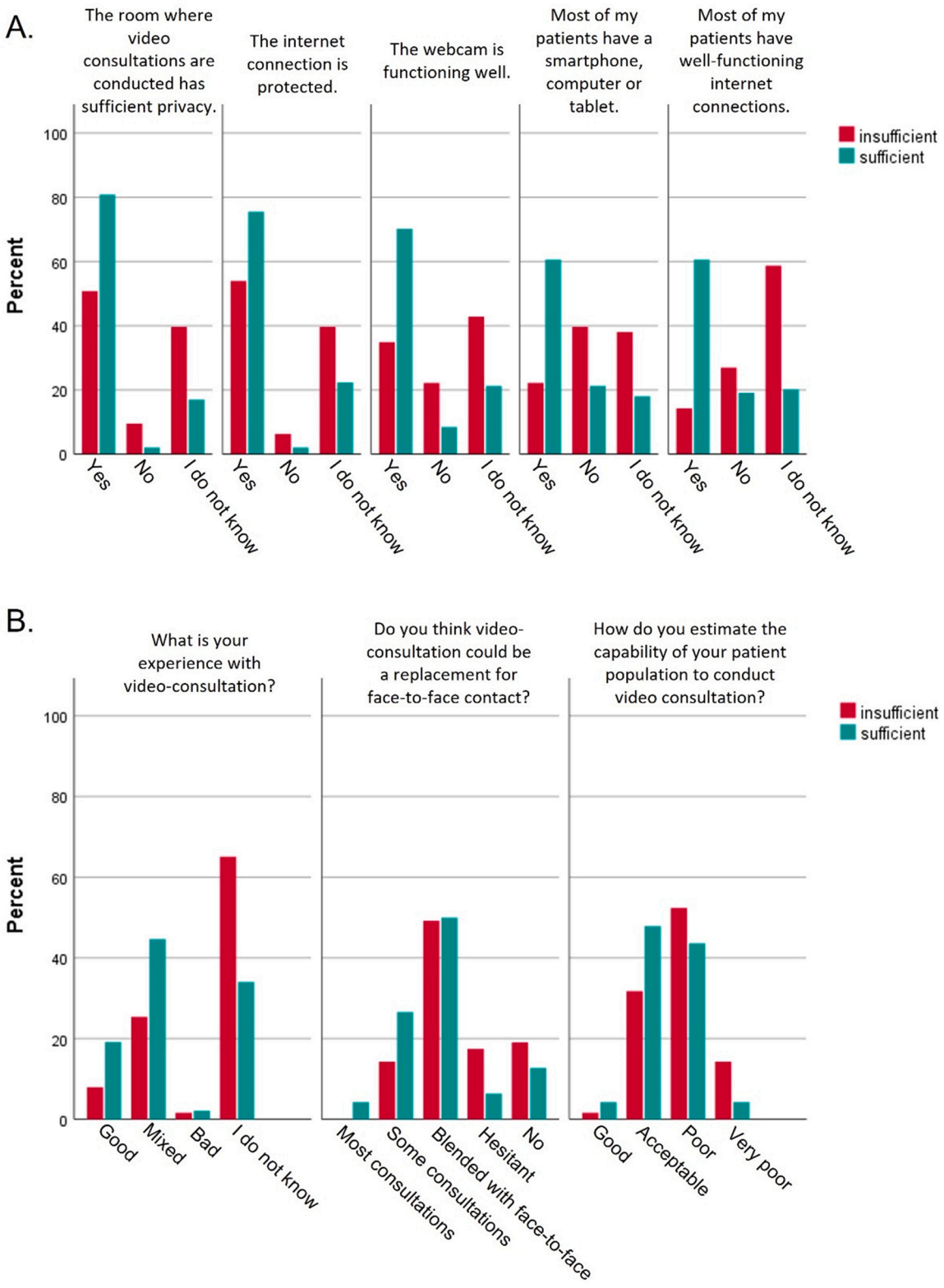

Fig. 2. a. Facilities for video-consultation. b. Experiences with video-consultation. Green: healthcare providers who rated themselves sufficient prepared for video-consultations (n = 94). Red: healthcare providers who rated themselves insufficient prepared for video-consultation (n = 63). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article).

drained. The vast majority considered their work meaningful.

The reported decline in delivery of diabetes care is in line with general observations concerning covid-related decreases in care volumes [35] as well as the negative impact of consultation reductions on people with diabetes [36–38]. Considering the frequently reported exhaustion and burnout of healthcare providers during the covid pandemic [39,40], the absence of health and wellbeing-related problems is surprising. This might be explained by the clear sense of having

Table 3
Linear regression model of the association between 'preparedness to conduct video-consultation' and 'profession', 'years of experience', 'GP practice location', 'capability of patients to perform video consultation' and 'whether video-consultation could be a replacement for face-to-face consultation'.

	Adjusted model			Crude model		
	B-coefficient	95% CI for B-coefficient	P-value	B-coefficient	95% CI for B-coefficient	P-value
Profession	1.353	0.412 to 2.295	0.005	1.679	0.776 to 2.582	0.000
Years of experience	0.001	-0.048 to 0.050	0.959			
GP practice location	0.215	-0.312 to 0.741	0.421			
Capability of patients to perform video consultation	-0.335	-1.098 to 0.427	0.386			
Could video-consultation be a replacement for face-to-face contact	-0.397	-0.880 to 0.086	0.106			

meaningful work among the respondents, which is also reported in another study [41]. This is known as a factor that protects against burnout [42], although evidence is not consistent [43]. In other words, despite the changed delivery of diabetes care, and the burden of providing diabetes care during the covid-19 pandemic, mental and physical wellbeing of our respondents seemed appropriate.

Diabetes care was mostly delivered in the classic ways – face-to-face or by telephone, although a quarter of the respondents had experiences with video consultation. In general, having access to good facilities seemed important for performing video-consultations. Our results showed that healthcare providers who felt sufficiently prepared to perform video consultations, more often found that this could be a replacement for face-to-face consultations, than care providers that felt insufficiently prepared.

The fact that approximately one fourth of the respondents had experiences with video consultations, is in line with other studies reporting substantial increases with the use of on-distance delivery of care [38,44] - although it cannot be ruled out that the different countries showed varying levels of experiences. Our results indicate that care providers felt prepared to varying levels to have video consultations. Previous studies reported technical problems as a barrier for video-consultation [45,46]. Indeed, respondents who did not have access to good facilities rated themselves more often insufficiently prepared. Among the sufficiently-prepared respondents, positive aspects and the potential substitute for classic consultation were mentioned. This echoes findings of a Spanish study among healthcare providers [47]. Regardless of the sense of preparedness, most respondents saw potency to blend classic and video consultations. Therefore, our results confirm the potential of video consultations.

This study is characterised by several strengths. The fact that several disciplines were involved in the development of the survey, varying from GP experts and epidemiologists to behavioural scientists, contributed to the quality of the survey. In addition, respondents were recruited through professional networks, which covered most of our study population. Nevertheless, this study is also subject to limitations that need to be mentioned. First, the number of respondents within the different countries fluctuated considerably. In Turkey, Ukraine and Sweden, the response was relatively low. This limits the representativeness of our findings for those countries. Second, considering the timing of the data collection, our findings represent experiences during the second wave of the covid-19 pandemic, which not necessarily represent experiences during others waves of the covid-19 pandemic. Third, the professions of the respondents varied among the countries. These differences in professional background might be explained by local organisation of the healthcare system.

To prepare diabetes care providers in countries with varying levels of wealth and different health systems for future covid-19 waves, more insight is needed into care providers' experiences with delivery of care. Considering the known burden of diabetes care providers in general [48,49], insight into key conditions for successful implementation of video consultation might also contribute to alleviation of providers' workload. Therefore, given the potency that our respondents indicated with regard to blending of classic and video consultation, a better understanding of barriers and facilitators of video consultation is of high importance. Besides, risk stratification of the diabetes population on severity and progression of diabetes might be useful to provide proactive care and deal with the increased workload and shortage of primary healthcare providers. By stratifying the diabetes population the ratio of face-to-face and digital diabetes care could be determined. So a low risk and well controlled subgroup who is capable to use eHealth could for example be seen face-to-face once a year, leaving room for a high risk and more vulnerable subgroup to see more often at the practice.

To summarise, as measured in the second wave of the covid-19 pandemic, less diabetes care was delivered and a negative impact on people with diabetes was observed. Although healthcare providers frequently reported feelings of overload and emotional exhaustion, physical and mental wellbeing seemed unaffected. Video consultations, which were adopted by a substantial part of the care providers, were seen as having potency. With regard to the risk of future waves of the covid-19 pandemics, but also proactive management of people with chronic conditions, these findings advocate further exploration of experiences with video consultation in diabetes primary care.

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Contributors

SG, SB, AC, SS, HV, MN and RC and RV developed the survey. SG, MZ, SR and RC analysed the data. SG and SB wrote the paper. All authors commented on the paper.

Declaration of interest for all authors

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.pcd.2023.02.002.

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