Using telehealth to deliver primary care to adolescents during and after the Covid-19 pandemic: Findings from a national survey of primary care professionals

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Melissa B. Gilkey[1] PhD; Wei Yi Kong[1] MA; Qian Huang[1] PhD; Brigid K. Grabert[1] PhD, JD; Peyton Thompson[1] MD; Noel T. Brewer[1] PhD

[1]University of North Carolina at Chapel Hill CHAPEL HILL US

Corresponding Author:
Melissa B. Gilkey PhD
University of North Carolina at Chapel Hill
CB 7440
CHAPEL HILL
US

Abstract

Background: The Covid-19 pandemic has led to an unprecedented use of telehealth, including among primary care professionals (PCPs) who serve adolescents.

Objective: To inform future practice and policies, we sought to characterize PCPs' recent experience using adolescent telehealth, as well as their support for it after the pandemic is over.

Methods: In February-March 2021, we conducted an online survey of 1,047 PCPs in the US. Our national sample included physicians (71%), advanced practice providers (17%), and nurses (12%) who provided primary care to adolescents, ages 11-17.

Results: Most PCPs reported using telehealth for a low, moderate, or high proportion of their adolescent patients in the three months prior to the survey (41%, 27%, and 21%, respectively); only 11% reported no use. A majority agreed that adolescent telehealth increases access to care (69%) and is a way they can provide high quality care (53%). Few believed adolescent telehealth takes too much time (14%) or encourages healthcare overuse (15%). Most supported giving families the option of adolescent telehealth for primary care after the pandemic is over (65%) and believed that health insurance plans should continue to reimburse for telehealth visits (82%). About two-thirds (67%) wanted to offer adolescent telehealth visits after the pandemic, with intentions being higher among those with recent telehealth experience (P<.001).

Conclusions: PCPs in our national sample reported widespread use of and predominantly positive attitudes toward adolescent telehealth. Our findings also suggest broad support among PCPs for continuing to offer adolescent telehealth after the Covid-19 pandemic ends.

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Melissa B. Gilkey[a,b], PhD, Wei Yi Kong[a], MA, Qian Huang[a], PhD, Brigid K. Grabert[a,b], PhD, JD, MPH, Peyton Thompson[c], MD, MSCR, & Noel T. Brewer[a,b], PhD

Affiliations:

[a]Department of Health Behavior, University of North Carolina, Chapel Hill, North Carolina;

[b]Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, North Carolina;

[c]Department of Pediatrics, Division of Infectious Diseases, University of North Carolina, Chapel Hill, NC

Address correspondence to: Melissa Gilkey, Department of Health Behavior, Gillings School of Global Public Health, University of North Carolina at Chapel Hill; 302 Rosenau Hall, CB#7400, Chapel Hill, NC 27599, gilkey@email.unc.edu, 919-966-8650

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Abbreviations: Covid-19 – coronavirus disease 2019; HPV – human papillomavirus; OR – odds ratio; PCP – primary care professional; SD – standard deviation; Tdap – tetanus, diphtheria and acellular pertussis; US – United States

Abstract

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Conclusions. PCPs in our national sample reported widespread use of and predominantly positive attitudes toward adolescent telehealth. Our findings also suggest broad support among PCPs for continuing to offer adolescent telehealth after the Covid-19 pandemic ends.

Introduction

The Covid-19 pandemic has rapidly transformed healthcare delivery in the United States (US), with telehealth for the first time playing a central role in the delivery of primary care for adolescents. Research conducted prior to the pandemic suggests that telehealth is a promising mode of delivering discrete types of healthcare for adolescents, including in the areas of mental health, asthma and diabetes management, and gender-affirming care.[1–4] A small body of research also documents the adolescent medicine community's impressive efforts to rapidly scale up telehealth programs in the pandemic's first months.[5–7] However, to our knowledge, no published national studies have explored primary care professionals' (PCPs') experience of delivering care to adolescents in the ensuing period, during which telehealth has presumably become a standard offering for many. Thus, we sought to characterize PCPs' recent adolescent telehealth use and attitudes, as well as their support for continuing to offer adolescent telehealth after the Covid-19 pandemic is over. By providing novel data from a national sample, this study seeks to inform telehealth practices and policies as leaders in adolescent health plan for primary care delivery in the post-pandemic era.

Methods

Participants and procedures

We conducted an online survey of PCPs in February-March 2021. We contracted with a survey research company to administer the survey, which we developed, to a standing national panel. The company maintained the panel using a combination of recruitment methods, including online registration, referrals, marketing emails, and digital ads. As part of the recruitment process, physicians provided licensure information used to verify their identity. For our survey, eligible panel members were US physicians, advanced practitioners (i.e., nurse practitioners and physician

assistants), and nurses who provided primary care, including vaccinations, to adolescents ages 11-17. In compliance with state policies governing PCPs' survey participation, our sample excluded residents of Vermont.

The survey company emailed invitations and up to two reminders to panel members. A total of 1,055 panel members responded by accessing the survey. The response rate was 61% among physicians and 41% among advanced practitioners and nurses (AAPOR response rate 4).[8] Participants provided informed consent and received up to $80 for their participation, depending on market rates in their area. Based on survey responses, we excluded 8 PCPs who indicated that they saw no adolescent patients in a typical week, resulting in a final sample size of 1,047 participants. The University of North Carolina Institutional Review Board approved the study protocol.

Measures

Our survey began with an introductory statement that defined adolescent telehealth as visits by video conference or phone for patients ages 11-17. The survey next assessed the extent of PCPs' recent telehealth use with a closed-ended question on the proportion of their adolescent patients they saw by telehealth in the three months prior to the survey; we re-categorized responses as high (51-75%, 76-99%, and 100%), moderate (26-50%), low (1-25%), or no (0%) use. Among PCPs with any (>0%) use, the survey used six closed-ended items to assess telehealth practice. Four of these items used pre-specified lists to assess the type of care provided, perceived advantages, perceived disadvantages, and technological barriers. One item assessed which vaccines PCPs always recommended during telehealth visits for adolescents who were due: seasonal influenza; human papillomavirus (HPV); tetanus, diphtheria and acellular pertussis (Tdap); and meningococcal ACWY. One item assessed how often PCPs requested confidential time to speak with adolescents during telehealth visits.

Our survey assessed PCPs' perceptions of adolescent telehealth with seven closed-ended questions that used 5-point response scales, ranging from "strongly disagree" (1) to "strongly agree"

(5). Four of these items assessed PCPs' attitudes on whether adolescent telehealth increases access to care, is a way they can provide high quality care, takes too much time, or encourages healthcare overuse. Two items assessed PCPs' support for adolescent telehealth after the Covid-19 pandemic is over in terms of whether families should still have the option to use telehealth for primary care visits and whether health insurance plans should continue to reimburse for visits. One item assessed PCPs' intentions in terms of whether they wanted to offer adolescent telehealth visits once the pandemic is over. For all seven items, we re-categorized responses as disagree ("somewhat" or "strongly"), neither agree or disagree, or agree ("somewhat" or "strongly").

Our survey assessed PCPs' demographic and professional characteristics, including their training, gender, race, number of years in practice, and number of adolescent patients seen in a typical week (Table 1). The survey also assessed characteristics of the clinics in which PCPs worked. These measures included clinic specialty (family medicine or pediatrics), practice type (solo/group versus other), whether the clinic was part of a healthcare system or network, the rurality of the area the clinic served, the US census region in which the clinic was located, and the extent to which the clinic experienced financial strain due to the Covid-19 pandemic.

Statistical analysis

We used Pearson's chi-square tests to compare the proportion of PCPs who indicated that they always recommended seasonal influenza vaccine versus each of the other vaccines (HPV, Tdap, meningococcal) during adolescent telehealth visits. We compared the number of advantages and disadvantages that PCPs endorsed for adolescent telehealth using a Wilcoxon signed-rank test. We used bivariate logistic regression to identify correlates of PCPs' intentions to offer adolescent telehealth visits once the Covid-19 pandemic is over, modeling the outcome as yes ("agree") versus no ("neither agree or disagree" and "disagree"). We then simultaneously entered statistically significant correlates into a multivariable model. We conducted analyses using Stata Version 15.1 (College Station, TX). Statistical tests were two-tailed with a critical alpha of 0.05.

Results

Participant characteristics

Our sample was comprised of physicians (71%), advanced practitioners (17%), and nurses (12%, Table 1). Most had 10 or more years of experience in practice (76%) and saw 10 or more adolescent patients in a typical week (73%). PCPs worked in clinics focusing on family medicine (71%) or pediatrics (29%). Clinics were in all four US regions, and included those in clinical systems or networks (56%) and serving rural areas (15%). Two-thirds (66%) of PCPs reported that their clinics had experienced moderate to high financial strain due to the Covid-19 pandemic.

Telehealth practice

Almost all PCPs reported using telehealth to see adolescent patients in the three months prior to the survey (Table 1). About one-fifth of our sample (21%) indicated high adolescent telehealth use, while others reported more moderate (27%) or low (41%) use. Only 11% of PCPs reported no recent adolescent telehealth use.

PCPs most often used telehealth for chronic disease management (64%), acute care (61%), mental and behavioral health (60%), or vaccine consultations (44%, Table 2). Most PCPs indicated that they always recommended seasonal flu vaccination during telehealth visits if adolescents were due (86%), but somewhat fewer said the same for HPV, Tdap, or meningococcal vaccines (77%, 76%, and 66%, respectively, all $P<.001$). About one-quarter (28%) of PCPs reported “always” or “often” requesting time to speak to adolescents confidentially during telehealth visits.

On average, PCPs reported more advantages than disadvantages of their recent adolescent telehealth use (mean=3.2 of 5 advantages [standard deviation=1.3] vs. 2.1 of 5 disadvantages [SD=0.9], $P<0.001$). The most common advantages were preventing Covid-19 exposure (83%), putting families at ease (77%), and reducing families’ transportation (70%) or time (69%) burdens

(Figure 1). Only about one-quarter of PCPs reported that gaining insight into families' home environments was an advantage (26%). The most common disadvantages were the inability to do physical exams (88%) and technology problems (63%). Only a minority of PCPs indicated that a lack of privacy (28%), health insurance problems (21%), or more missed appointments (11%) were disadvantages. Of the 584 PCPs who indicated technology problems as a disadvantage, most reported that poor quality internet connections (85%) and families' lack of internet-enabled devices (60%) were common barriers (Table 2).

Telehealth attitudes and post-pandemic support

Most PCPs reported positive attitudes toward adolescent telehealth. A majority agreed that telehealth increased access to care for adolescents (69%) and was a way they could provide high quality care (53%, Figure 2). Few agreed that telehealth took too much time (14%) or encouraged families to overuse healthcare for adolescents (15%).

Most PCPs indicated support for adolescent telehealth after the Covid-19 pandemic is over (Figure 2). About two-thirds (65%) agreed that families should continue to have the option of telehealth for adolescent primary care visits. About four-fifths (82%) agreed that health insurance plans should continue to reimburse for telehealth visits.

Telehealth intentions

About two-thirds of PCPs agreed that they want to offer adolescent telehealth visits once the Covid-19 pandemic is over (*n*=702, 67%), while the remainder disagreed (*n*=188, 18%) or neither agreed or disagreed (*n*=157, 15%). In multivariable analyses, wanting to offer telehealth was more common among PCPs with high, moderate, and low versus no experience seeing adolescents by telehealth in the three months prior to the survey (80%, 74%, and 66% vs. 31%, all *P*<.001, Table 3). Wanting to offer telehealth was also more common among PCPs who worked in clinics that served urban versus rural areas (71% vs. 59%, *P*<.05) or that were located in the South or West versus

Northeast (69% and 71% vs. 61%, both $P<.05$). Wanting to offer telehealth was less common for PCPs with more years in practice (66% for 10-19 years, 62% for ≥20 years vs. 77% for ≤9 years, both $P<.05$). In bivariate analyses, PCPs' adolescent telehealth intentions correlated with working outside of a solo/group practice or within a healthcare system, but these associations did not retain statistical significance in the multivariable model.

Discussion

Adolescent telehealth has achieved widespread adoption in the year since the Covid-19 pandemic began, with most PCPs in our national study reporting that they used adolescent telehealth and wanted to keep using it. The vast majority (89%) of PCPs reported using telehealth to see adolescents in the prior three months, including for chronic disease management, acute care, and mental health. This level of adoption is far higher than that reported by pre-pandemic studies which found that very few pediatricians or family physicians were using telehealth to deliver care (13% and 15%, respectively).[9,10] On average, PCPs in our sample reported that adolescent telehealth offered more advantages than disadvantages, with advantages including increased access to care and reduced time and transportation burdens for families. The most commonly noted disadvantages were the inability to do physical exams and technology problems. Despite these limitations, PCPs indicated broad support for adolescent telehealth after the pandemic is over, with about two-thirds wanting to offer such visits themselves. This support suggests a pressing need to build on the strengths, address the challenges, and evaluate the quality of adolescent telehealth to ensure it remains a viable option for primary care delivery in the post-pandemic era.

Our study provides novel data on two potential challenges for the delivery of adolescent telehealth: vaccine communication and privacy. With regard to vaccine communication, we found that the proportion of PCPs reporting that they "always" recommended vaccines during adolescent telehealth visits was high for seasonal influenza vaccine, perhaps in response to concerns about a flu-

Covid “twindemic.” Consistent recommendations were less common for HPV, Tdap, and meningococcal vaccines. In the case of HPV vaccine, pre-pandemic studies that have used similar measures in the context of traditional primary care have documented levels of recommendation consistency that are comparable to or lower than what we observed.[11–13] Although such points of comparison are not available for other adolescent vaccines, our findings suggest that many PCPs are including vaccine counseling in adolescent health visits, and these data can inform interventions to support and further strengthen this communication. For example, PCPs may benefit from electronic health record prompts to remind them to recommend adolescent vaccines during telehealth visits and to counsel families about how to schedule those visits. Such care coordination could help to ensure that adolescent telehealth complements versus competes with the in-person care that is integral to the delivery of vaccinations and other routine preventive health services for adolescents.[14]

Consistent with prior studies,[5,6] our findings suggest that privacy constitutes an important consideration, but may not be a primary barrier to the delivery of adolescent telehealth. Among PCPs in our sample with recent experience, only about one-quarter perceived a lack of privacy as a disadvantage of adolescent telehealth. At the same time, however, only about one-quarter routinely offered adolescents confidential time during telehealth visits. Despite being a recommended practice, confidential time is also inconsistently offered during in-person visits,[15,16] so this low level of guideline adherence is perhaps unsurprising. Nevertheless, PCPs may have the opportunity to strengthen their telehealth practice by more consistently offering confidential time, and by counseling adolescents to take steps, such as using earphones, that may help protect their privacy.[5,7,17]

Our study can inform future policymaking by documenting PCPs’ support for offering adolescent telehealth after the pandemic is over. Telehealth adoption during the pandemic has been possible due to expanded payer reimbursement, which pre-pandemic studies identified as the single largest barrier to bringing pediatric telehealth programs to scale.[9,14,18] Importantly, most PCPs in our sample believed that health insurance plans should continue to reimburse for adolescent telehealth

after the pandemic is over. Furthermore, many PCPs believed families should have the option of telehealth for adolescent primary care visits and wanted to offer telehealth visits themselves. Wanting to offer adolescent telehealth was more common among PCPs who had recently used it or who worked in the South or West, but less common among those serving rural areas. Future research can extend the present study by assessing factors, such as internet connectivity, that might explain these geographic differences.

This study is, to our knowledge, the first national evaluation of PCPs' experience using adolescent telehealth in the context of the Covid-19 pandemic. Study strengths include the use of data from a large, national sample of PCPs, including physicians, advanced practitioners, and nurses. While evaluating adolescent telehealth from the perspective of those who deliver it is a study strength, our use of self-reported measures also constitutes a limitation. For example, PCPs may have overestimated the consistency with which they recommended vaccines or offered confidential time during adolescent telehealth visits. Another limitation is the modest response rate among advanced practice providers and nurses. Including non-physician participants was important for enriching our data with diverse perspectives, but additional research with larger sample sizes may be needed to more fully understand how adolescent telehealth practice and attitudes vary across clinical roles. We acknowledge that other perspectives and data sources are important for understanding the impact of adolescent telehealth. Most notably, PCPs in our sample perceived telehealth as expanding access to care and reducing burden on their patients, but future research is needed to understand the extent to which adolescents and their families experience telehealth as patient-centered and equitable. Finally, we note that our study examines telehealth broadly as including visits by video and phone. PCPs' experience of adolescent telehealth may vary between these two delivery modes, as well as by health system factors such as the extent to which telehealth is integrated with electronic health record platforms and patient portals. Future research will be needed to understand the influence of these contextual factors.

Conclusion

One year into the Covid-19 pandemic, our national study finds that PCPs have widely adopted adolescent telehealth and endorse its continued use. In light of this endorsement, healthcare system leaders, payers, professional organizations, researchers, and other key stakeholders should redouble their efforts to support PCPs in adolescent telehealth delivery, including by further evaluating and fairly reimbursing such services. In this way, we can ensure that telehealth realizes its potential to increase healthcare access and to serve adolescents in a way that is effective, patient-centered, and equitable.

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Figure Legend

Figure 1. Perceived advantages (A) and disadvantages (B) of adolescent telehealth (*n*=929)

Figure 2. Attitudes toward and post-pandemic support for adolescent telehealth (*n*=1,047)

Table 1. Sample characteristics (*n*=1,047)

	n	(%)
Primary care professional characteristics		
Training		
Physician	747	(71)
Advanced practice provider[a]	177	(17)
Nurse	123	(12)
Gender		
Woman	515	(49)
Man	492	(47)
Other[b]	40	(4)
Race		
White	717	(68)
Black	41	(4)
Asian	170	(16)
Other	119	(11)
Years in practice		
0-9	252	(24)
10-19	395	(38)
20 or more	400	(38)
Adolescent patients seen in typical week		
1-9	283	(27)
10-24	431	(41)
25 or more	333	(32)
Proportion of adolescents seen by telehealth In prior 3 months		
None (0%)	118	(11)
Low (1-24%)	424	(41)
Moderate (25-50%)	286	(27)
High (51-100%)	219	(21)
Clinic or practice characteristics		
Specialty		
Family medicine	748	(71)
Pediatrics	299	(29)
Practice type		
Solo or group	696	(66)
Other[c]	351	(34)
Part of a healthcare system		
No	457	(44)
Yes	590	(56)
Rurality		
Urban	363	(35)
Suburban	525	(50)

	n	(%)
Rural	159	(15)
Region		
Northeast	265	(25)
Midwest	247	(24)
South	333	(32)
West	202	(19)
Covid-19 financial strain		
None or a little	360	(34)
Moderate to high	687	(66)

[a] Includes nurse practitioners and physician assistants
[b] Includes neither woman nor man, prefer to self-describe, and prefer not to say
[c] Includes hospital- and university-affiliated clinics, Federally Qualified Health Centers, and community, public health, and non-profit clinics

Table 2. Telehealth practice among primary care professionals with recent adolescent telehealth visits (*n*=929)

	n	(%)
Type of adolescent telehealth visits provided		
Chronic disease management	599	(64)
Acute care	571	(61)
Mental and behavioral health	561	(60)
Vaccine consultation	406	(44)
Other well-child care	387	(42)
Sexual health and contraceptive counseling	359	(39)
None of these	14	(2)
Vaccines always recommended if due		
Seasonal influenza	798	(86)
Human papillomavirus	715	(77)
Tetanus, diphtheria and acellular pertussis	709	(76)
Meningococcal	612	(66)
None of these	48	(5)
Request to speak with adolescent confidentially		
Always or often	263	(28)
Sometimes	356	(38)
Rarely or never	310	(33)
Technology problems[a]		
Poor quality internet connections	499	(85)
Families' lack of internet-enabled devices	353	(60)
Lack of training for providers and staff	195	(33)
Difficulty working with medical interpreters	128	(22)
None of these	21	(4)

[a] Among the subset of participants who reported technology problems as a disadvantage (*n*=584)

Table 3. Correlates of primary care professionals' intention to offer adolescent telehealth after the Covid-19 pandemic (*n*=1,047)

	PCPs who want to offer telehealth/ Total PCPs in category (%)		Bivariate			Multivariable		
			OR	(95% CI)	*P*	OR	(95% CI)	
PCP characteristics								
Training								
Physician	492/747	(66)	1			--		
Advanced practice provider	126/177	(71)	1.28	(0.89-1.83)	0.18	--		
Nurse	84/123	(68)	1.12	(0.74-1.68)	0.60	--		
Years in practice								
0-9	194/252	(77)	1			1		
10-19	262/395	(66)	0.59	(0.41-0.84)	0.004	0.63	(0.43-0.92)	0
20 or more	246/400	(62)	0.48	(0.33-0.68)	<0.001	0.64	(0.44-0.94)	0
Adolescent patients seen in typical week								
1-9	190/283	(67)	1			--		
10-24	289/431	(67)	1.00	(0.72-1.37)	0.98	--		
25 or more	223/333	(67)	0.99	(0.71-1.39)	0.96	--		
Proportion of adolescents seen by telehealth in prior 3 months								
None (0%)	36/118	(31)	1			1		
Low (1-24%)	280/424	(66)	4.43	(2.85-6.88)	<0.001	4.61	(2.92-7.27)	<0
Moderate (25-50%)	211/286	(74)	6.41	(4.00-10.28)	<0.001	6.53	(4.01-10.64)	<0
High (51-100%)	175/219	(80)	9.06	(5.43-15.13)	<0.001	8.99	(5.31-15.23)	<0
Clinic or practice characteristics								
Specialty								
Family medicine	510/748	(68)	1			--		
Pediatrics	192/299	(64)	0.84	(0.63-1.11)	0.22	--		
Practice type								
Solo or group	450/696	(65)	1			1		
Other	252/351	(72)	1.39	(1.05-1.84)	0.02	1.16	(0.83-1.61)	0
Part of clinical system								
No	280/457	(61)	1			1		
Yes	422/590	(72)	1.59	(1.22-2.06)	<0.001	1.33	(0.98-1.79)	0
Rurality								
Urban	258/363	(71)	1			1		
Suburban	350/525	(67)	0.81	(0.61-1.09)	0.17	0.87	(0.63-1.19)	0
Rural	94/159	(59)	0.59	(0.40-0.87)	0.008	0.59	(0.39-0.90)	0

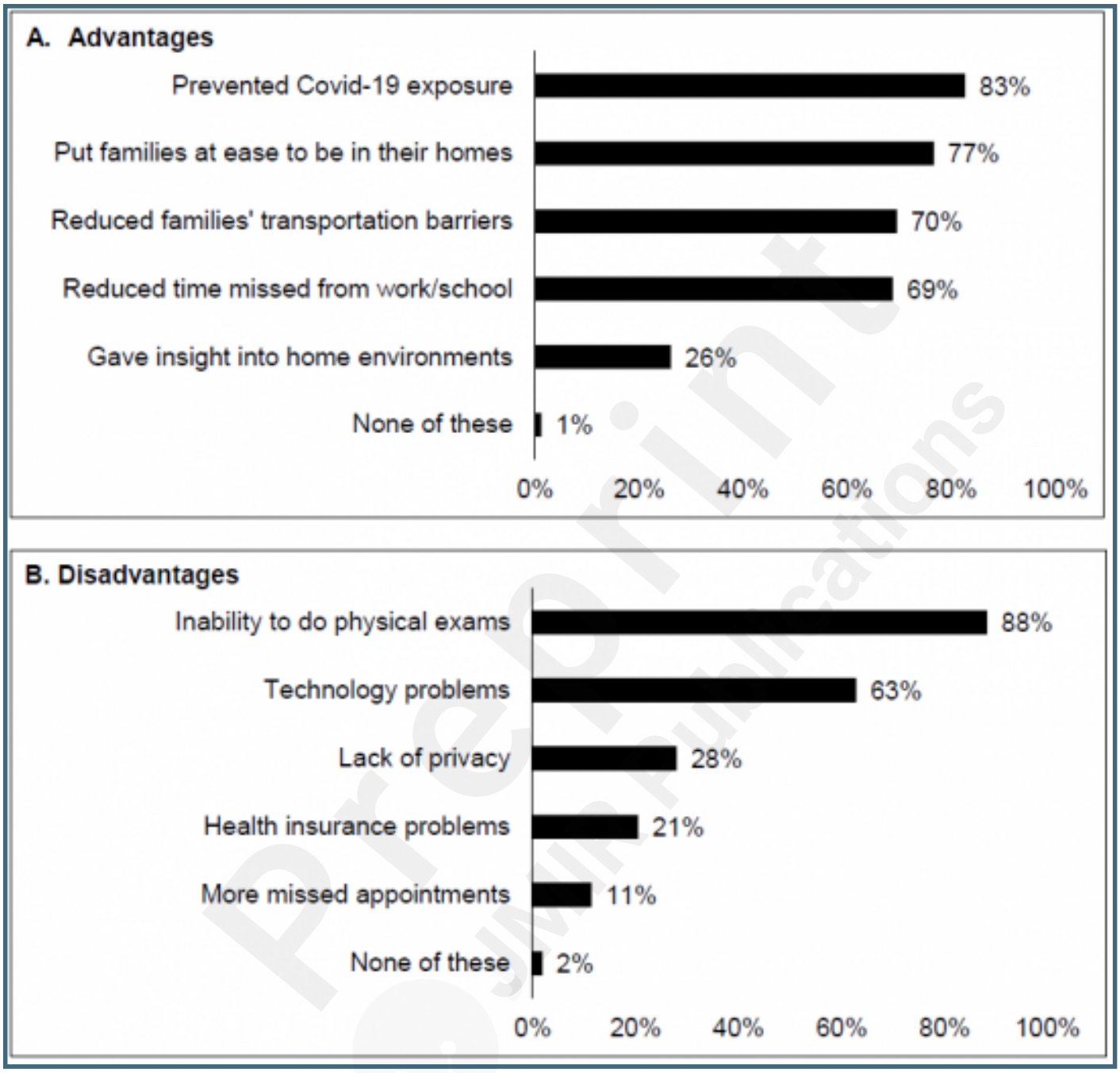
	PCPs who want to offer telehealth/ Total PCPs in category (%)		Bivariate			Multivariable		
			OR	(95% CI)	*P*	OR	(95% CI)	
Region								
Northeast	161/265	(61)	1			1		
Midwest	167/247	(68)	1.35	(0.94-1.94)	0.11	1.35	(0.92-1.99)	0
South	231/333	(69)	1.46	(1.04-2.05)	0.03	1.73	(1.20-2.49)	0
West	143/202	(71)	1.57	(1.06-2.31)	0.03	1.52	(1.01-2.31)	0
Covid-19 financial strain								
None or a little	241/360	(67)	1			--		
Moderate or more	461/687	(67)	1.01	(0.77-1.32)	0.96	--		

Note. PCP: primary care professional. OR: odds ratio. CI: confidence interval. Dashes (--) indicate the variable was not included in the multivariable model because it was not statistically significant at the bivariate level.

Supplementary Files

Figures

Perceived advantages (A) and disadvantages (B) of adolescent telehealth (n=929).



Attitudes toward and post-pandemic support for adolescent telehealth (n=1,047).