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Psychiatrists' Comfort Using Computers and Other Electronic Devices in Clinical Practice

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Abstract

This report highlights findings from the *Study of Psychiatrists' Use of Informational Resources in Clinical Practice*, a cross-sectional Web- and paper-based survey that examined psychiatrists' comfort using computers and other electronic devices in clinical practice. One-thousand psychiatrists were randomly selected from the American Medical Association Physician Masterfile and asked to complete the survey between May and August, 2012. A total of 152 eligible psychiatrists completed the questionnaire (response rate 22.2 %). The majority of psychiatrists reported comfort using computers for educational and personal purposes. However, 26 % of psychiatrists reported not using or not being comfortable using computers for clinical functions. Psychiatrists under age 50 were more likely to report comfort using computers for all purposes than their older counterparts. Clinical tasks for which computers were reportedly used comfortably, specifically by psychiatrists younger than 50, included documenting clinical encounters, prescribing, ordering laboratory tests, accessing read-only patient information (e.g., test results), conducting internet searches for general clinical information, accessing online patient educational materials, and communicating with patients or other clinicians. Psychiatrists generally reported comfort using computers for personal and educational purposes. However, use of

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Compliance with Ethical Standards

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computers in clinical care was less common, particularly among psychiatrists 50 and older. Information and educational resources need to be available in a variety of accessible, user-friendly, computer and non-computer-based formats, to support use across all ages. Moreover, ongoing training and technical assistance with use of electronic and mobile device technologies in clinical practice is needed. Research on barriers to clinical use of computers is warranted.

Keywords

Psychiatry; Computer use; Clinical practice; EHR; Health care technology

Introduction

In medical practice, clinicians must maintain expertise in the face of an ever-expanding evidence base. According to Davies information from biomedical research approximately doubles every 20 years. Advances in computers and mobile device technologies connect physicians with an array of clinical information resources and facilitate rapid knowledge acquisition, including at the point of care [1]. Consequently, adoption and effective use of information technology (IT) can have a substantial impact on the quality of patient care and on physicians' ability to maintain a current knowledge base.

Non-primary care physicians generally lag in adopting electronic health records (EHRs) when compared to primary care physicians [2–5]. In addition, psychiatrists lag behind other specialties in adoption of information technologies [6–10]. This is particularly true for psychiatrists who practice in small group or solo practice settings [11]. The slower pace of adoption among psychiatrists may relate to a poor fit or usability of EHR systems for psychiatric practice, minimal IT support for psychiatrists in small group or solo practice settings, limited training or experience with computers, concerns about confidentiality of patient data, and computer use interference with therapeutic alliance during clinical encounter [5, 6, 10–14].

Given the move toward evidence-based care in psychiatry and the fast-paced advances in technology supporting clinical care, it is essential to understand the factors that may influence psychiatrists' adoption of information technologies. The American Psychiatric Association (APA) implemented the *Study of Psychiatrists' Use of Informational Resources in Clinical Practice* in 2012. One of the objectives of this study was to determine factors that may influence psychiatrists' level of comfort and extent of computer use for personal and professional purposes. We hypothesized that younger psychiatrists and psychiatrists who work in larger practice settings would be more comfortable using computers for educational, clinical, and personal uses, when compared to older psychiatrists and those working in solo or smaller group office settings.

Methods

The *Study of Psychiatrists' Use of Informational Resources in Clinical Practice* was a cross-sectional survey of psychiatrists involved in direct patient care on a full or part-time basis. The survey was conducted between May 1 and August 31 of 2012.

A letter of invitation was initially mailed to 1000 randomly selected physicians in the United States who self-identified as psychiatrists, provided permission to be contacted, and had not participated in any APA surveys within the previous 24 months. The American Medical Association Physician Masterfile was used as the sampling frame. The invitation included a link to the Web-based questionnaire. Follow-up mailings were sent to non-responders 1 and 2 months after the start of the study. In these follow-up mailings, the psychiatrists were mailed the paper version of the survey and given the option of completing either the Web or paper survey. Reminders were sent to non-responders at 1 and 2 weeks after each mailing. As an incentive, respondents were informed that their names were entered into a lottery with a chance of winning one of seven \$1000 gift checks.

Of the 1000 psychiatrists, 1 was deceased, 145 had undeliverable contact information, 2 declined to participate, and 663 did not respond. A total of 189 attempted to complete the survey (response rate 22.2 %); 37 were found to be ineligible (12 were not involved in direct patient care and 25 no longer practiced psychiatry). In total, 152 eligible psychiatrists completed the survey.

Institutional Review Board

On the basis of the decision of the APA Institutional Review Board, this study was considered minimal risk. As such, participating psychiatrists were not required to complete written informed consent.

Measures

Questions and themes previously identified in the literature were reviewed and incorporated into the questionnaire for psychiatrists [15–29]. The survey included open and closed-ended questions that inquired about psychiatrists' practice characteristics, comfort using computers for professional and personal activities, types of clinical questions encountered in practice, and preferred clinical information resources for seeking answers to clinical questions.

Psychiatrists' Practice Characteristics—Using a timeframe of “last typical work week”, respondents were asked to provide information on 1) their professional activities, including the number of hours spent in direct patient care, indirect patient-care, and other professional non-patient related activities (e.g., continuing medical education, teaching); and 2) the number of patients seen across various clinical settings (e.g., solo or group practice, public/private outpatient clinics, public/ private inpatient facilities, and other settings).

An a priori criterion was used to define primary practice settings. When a psychiatrist reported treating greater than 50 % of their patients in a specified location, this was designated as their primary practice setting. For example, psychiatrists with greater than 50 % of their patients treated in public/private clinics were designated as practicing in a clinic setting. Some psychiatrists indicated seeing patients in multiple locations with none meeting the “greater than 50 % of patients” criterion. This pattern of practice setting was categorized as “Other” and grouped with the inpatient setting (e.g., hospitals, nursing facilities, residential treatment settings) for purposes of analysis.

Psychiatrists' Comfort Using Computers and Other Electronic Devices—

Psychiatrists' comfort using computers and other electronic devices (henceforth referred to as comfort using computers) was measured on a 6-point scale that ranged from 0 = do not use computers to 5 = very comfortable using computers. A dichotomous measure was developed where "do not use computers = 0" and "not at all comfortable = 1" were combined to indicate psychiatrists' lack of comfort using computers. Responses "somewhat comfortable = 2 or 3" and "very comfortable = 4 or 5" were all combined to indicate an overall degree of comfort using computers, based on an a priori decision that "somewhat to very comfortable" indicates some level of familiarity and comfort with using computers. Separate ratings were obtained for comfort using computers for clinical, professional educational and personal purposes.

Psychiatrists' Use of Computers for Specific Clinical Tasks—

Psychiatrists were asked to indicate the percentage of patients for whom they used computers to carry out specific clinical tasks. The tasks included accessing general clinical information; performing assessments such as clinical rating scales; obtaining read-only patient information such as laboratory data or medication history; prescribing medications; ordering laboratory tests; documenting clinical encounters; accessing online treatment algorithms or patient educational materials; and communicating with other clinicians or patients. Responses indicating use of computers for 20 % or more of a psychiatrist's patient caseload were considered "routine use" of computers for the specified clinical function, based on an a priori assumption that use of any intervention or technology for 20 % or more of patient caseload may be considered routine.

Analytic Methods

Univariate analyses including basic frequencies for categorical variables, and means with standard deviations, and 95 % confidence intervals around the means for continuous variables were used to characterize the study sample. Bivariate analyses were conducted to examine the relationship between psychiatrists' personal and practice characteristics and comfort with using computers. Cochran–Armitage Trend Tests for categorical analyses were conducted to identify any trends in relationship between psychiatrists' age and their comfort using computers for various tasks. All quantitative analyses were conducted using SAS 9.1.3.

Results

Of the 152 respondents, 149 were practicing psychiatrists providing direct patient care and 3 psychiatric residents. The sample ranged in age from 31 to 91 years (mean age = 56.9 years). Thirty-five percent of the psychiatrists were below 50 years of age; 44 % were ages 50–64; and 21 % were aged 65 years and over. Respondents were predominantly males (58 %). The majority practiced general psychiatry (80 %) while the remaining 20 % practiced child and adolescent, forensic, or other psychiatric subspecialties. Non-responders had comparable distributions of age, sex, and psychiatric specialty.

Responding psychiatrists worked an average of 43.6 h (95 % CI 40.9–46.2) in a typical work week. On average, 29.7 h (95 % CI 27.4–32.0) were spent in direct patient care, and 8.7 h (95 % CI 7.6–9.8) were spent in indirect patient care activities.

During a typical work week, psychiatrists reported treating an average of 49 patients (95 % CI 42.5–55.4). Half (50 %) of psychiatrists reported treating the majority (i.e., 51 % or more) of their patients in solo or group office practice settings, 26 % treated a majority of their patients in a clinic setting, and 24 % treated a majority of their patients in hospital or other settings (e.g., residential treatment facilities, nursing homes, mixed settings).

Although not statistically significant (Table 1), a modest trend was observed for age and practice setting. Psychiatrists ages 50–64 and over age 65 were more likely to work in solo practice settings, whereas psychiatrists under age 50 were more likely to work in clinic settings.

Psychiatrists' Comfort Using Computers

A majority of psychiatrists reported being somewhat to very comfortable using computers for personal use (96 %), professional educational activities (93 %), and clinical purposes (74 %) (Fig. 1). A small proportion of psychiatrists reported not using computers or not feeling comfortable using computers for personal (4 %) or professional educational purposes (7 %). In contrast, a striking 26 % of psychiatrists reported not using or being comfortable at all using computers for clinical functions.

An inverse relationship was observed between psychiatrists' age and level of comfort using computers for clinical, professional educational and personal purposes, with the reported level of comfort decreasing with increases in psychiatrists' age (Fig. 1). For example, 63 % of psychiatrists 65 years and older reported not using or not being comfortable using computers for clinical purposes. In contrast, only 25 % of those ages 50–64, and 8 % of psychiatrists under age 50 expressed a lack of comfort using computers for clinical purposes (Statistic $Z = 5.15$, $p < 0.001$). Similar patterns were observed regarding psychiatrists' lack of comfort using computers for professional educational purposes: 25 % of psychiatrists 65 and older compared to 4 % of psychiatrists ages 50–64 and 0 % of psychiatrists less than 50 years of age expressed a lack of comfort using computers for professional educational purposes (Statistic $Z = 3.96$, $p < 0.01$). On the other hand, uptake of computers for personal use is evident across all age groups; only 11 % of psychiatrists 65 years and older, 5 % of psychiatrists age 50–64, and 0 % of those younger than 50 reported not using or not being comfortable using computers for personal purposes (Statistic $Z = 2.30$, $p < 0.05$).

The psychiatrists' predominant practice setting was also associated with differences in the level of comfort using computers. A higher proportion of psychiatrists practicing in clinic settings reported comfort using computers for clinical purposes in contrast to those practicing in solo or group offices, hospitals or other settings ($\chi^2 = 8.3$, $p < 0.05$). There were no statistically significant differences in comfort using computers for professional educational or personal purposes among psychiatrists who practiced in different types of settings (Table 2).

Psychiatrists' Use of Computers for Specific Clinical Tasks

The range of clinical tasks for which psychiatrists reported using computers routinely (i.e., for over 20 % of patients) included documenting clinical encounters (58 % of psychiatrists), searching for general clinical information (51 %), prescribing medications (45 %), accessing online patient educational materials (40 %), accessing read-only patient information such as laboratory results (40 %), communicating with other clinicians (38 %), ordering laboratory tests (27 %), electronically communicating with patients (21 %), reviewing treatment algorithms (16 %), and performing electronic patient assessment (16 %) (Table 3).

Use of computers to accomplish specific clinical tasks also demonstrated considerable variability across age groups, with inverse relationships between age and use of computers for each task (Table 3). For example, 75 % of psychiatrists younger than 50 reported using computers routinely to electronically document encounters, whereas 60 % of the psychiatrists age 50–64, and only 24 % of psychiatrists 65 years and older reported using computers for this purpose (Statistic $Z = 4.29$, $p < 0.001$). Similarly, a significantly higher proportion of psychiatrists under age 50, compared to those over 50 years of age, reported using computers routinely to perform other clinical tasks enumerated in Table 3.

In examining the relationship between psychiatrists' routine use of computers for specific clinical tasks and the setting in which they practiced, a number of significant differences were observed (Table 4). For instance, a higher proportion of psychiatrists who predominantly practiced in clinic settings in contrast to psychiatrists practicing in solo or group, or hospital and other settings reported routine use of computers for documenting encounters ($\chi^2 = 8.3$, $p < 0.001$), accessing read-only patient information ($\chi^2 = 26.0$, $p < 0.001$), prescribing ($\chi^2 = 13.6$, $p < 0.01$), and ordering of tests ($\chi^2 = 16.1$, $p < 0.001$). On the other hand, a higher proportion of psychiatrists who predominantly practiced in solo or group practices used computers routinely to electronically communicate with their patients, compared to psychiatrists who predominantly practiced in clinic and hospital or other settings ($\chi^2 = 6.4$, $p < 0.05$). There were no statistically significant differences across practice settings for psychiatrists' use of computers for other clinical tasks.

Discussion

According to the findings of this study, psychiatrists are comfortable using computers for personal as well as professional educational purposes. Only a small percent of psychiatrists reported not using or not being comfortable at all using computers for such purposes. Even among psychiatrists over age 65, 90 % were somewhat comfortable or comfortable using computers for personal tasks. This finding suggests that Web-based and other electronic information resources could be used readily by psychiatrists for clinical and educational purposes, especially if designed and organized in an accessible, user-friendly fashion.

In contrast, over a quarter of psychiatrists reported not using computers comfortably or at all for clinical purposes. This finding supports other observations of lower rates of health IT adoption by psychiatrists compared to primary care and other medical specialists [6–10]. Indeed, even after accounting for practice type, geographic region and other physician characteristics, outpatient psychiatrists had a lower likelihood of adopting an EHR than

ambulatory physicians in any other specialty [7]. It is unlikely that these lower adoption rates are related to a lack of comfort or ability to use technology since many computer-based clinical tasks are similar to tasks performed for personal or educational use. For example, searches for general clinical information, accessing online patient educational materials and reviewing treatment algorithms are comparable to personal or educational online searches, and electronic communications with patients or other clinicians are similar to personal use of electronic communication. Instead, adoption of health IT among psychiatrists for clinical care is likely to be slowed by concerns about confidentiality, lack of IT support, few psychiatry-specific features in most EHRs, upfront and ongoing costs of EHRs, and interference with therapeutic alliance during clinical encounter [5, 6, 10–14]. Moreover, in the past hospitals and clinics had policies prohibiting their clinicians from interacting with their patients via email, to ensure patient confidentiality [30]. However, these policies are now changing where more institutions encourage provider-patient email communications [31, 32], specifically through patient portal, for administrative and clinical purposes.

The observed inverse relationship between psychiatrists' age and level of comfort using computers for clinical tasks has been noted among other primary and specialty care physician groups [2–5, 33, 34]. The lower levels of comfort and use of computers for clinical purposes reported by psychiatrists in small practices are also consistent with observations of EHR adoption among other physician groups [2–5, 33, 34]. In addition to common barriers to EHR adoption such as cost, design, ease of use, technical concerns, privacy/security, and effects on productivity [35], smaller practices express particular concerns about the costs of EHRs and the financial viability of software vendors [36], issues that may be of particular importance to psychiatrists.

Limitations

Results of this study should be interpreted with the caveat that low response rate lessens generalizability of the results to all psychiatrists in the United States. Additionally, computer users may have been more likely to complete the study questionnaire, which could potentially overestimate computer use among psychiatrists. Also, data for this study were collected in 2012, and some increase in use of computers would be expected, due to entry of younger and more computer savvy psychiatrists into psychiatric workforce and retirement of older psychiatrists. Inpatient psychiatrists will also be more likely to use EHRs for clinical purposes given the significant increases in basic EHR use by hospitals since 2012 [37]. During early stages of the implementation of the Centers for Medicare and Medicaid Services' (CMS) EHR incentive programs and meaningful use (MU) requirements, adoption of basic EHRs by office-based physicians overall increased nearly 26 % between 2011 and 2012, and subsequently increased 21 % between 2012 and 2013, based on findings from the National Ambulatory Medical Care Survey [2, 38]. However, for office-based psychiatrists, it is unlikely that the CMS incentives and MU would have fueled a comparable increase in EHR use, since only about 6100 psychiatrists had attested to Stage 1 of MU as of September 2015 [39]. In addition, psychiatrists are more likely than other specialists to opt out of Medicare [40] reducing the number who are eligible for CMS incentives. Despite the abovementioned limitations, the results of this study provide a valuable snapshot of computer use by psychiatrists in clinical settings.

To reduce healthcare disparities and improve care coordination and quality, it is essential to encourage use of computers for clinical purposes by psychiatrists [12]. Our findings highlight the need for outreach and training, particularly targeting older psychiatrists and those working in solo- or small group practices. Federally funded Regional Extension Centers (RECs) effectively provided technical assistance and promoted use of EHRs among primary care physicians [3, 41] although long periods of engagement were needed to show an effect on quality [42]. In addition to technical assistance, financial incentives other than the current CMS programs may be needed to enhance EHR adoption among psychiatrists. Development of EHRs that meet specialty-specific needs may also increase use of computers in clinical practice [5, 43].

Conclusion

Overall, psychiatrists reported comfort using computers for personal and educational purposes. Although comfort with computers was less common among psychiatrists over age 65 as compared to younger psychiatrists, and only a very small fraction of psychiatrists did not use computers at all. However, use and comfort with computers in clinical care was less common, particularly among older psychiatrists and psychiatrists working in small, office-based practice settings. Consequently, information and educational resources need to be available in a variety of accessible, user-friendly, computerized and non-computer-based formats, to support use across all age groups. Moreover, financial incentives, ongoing training and technical assistance with use of electronic and mobile device technologies may be needed to promote adoption, particularly of EHRs. Research on barriers and facilitators of computer use among psychiatrists is also warranted.

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Biographies

Farifteh F. Duffy, PhD currently serves as the Director of Quality of Care Research at the American Psychiatric Association Foundation. As a mental health services researcher, Dr. Duffy's areas of interest relate to the study of the patterns, quality, and outcomes of pharmacological and psychosocial treatments for psychiatric disorders, and translation of research into clinical practice to support implementation of best practices. Dr. Duffy earned a Ph.D. in Mental Health Services Research and M.H.S. in Mental Hygiene from the Johns Hopkins Bloomberg School of Public Health. She has also earned a M.S. in Education, from the Johns Hopkins University School of Continuing Studies.

Laura J. Fochtmann, M.D., M.B.I. is a Professor in the Departments of Psychiatry, Pharmacological Sciences and Biomedical Informatics at Stony Brook University. She also serves as medical editor of the practice guidelines of the American Psychiatric Association. Dr. Fochtmann's areas of interest relate to improving the quality of care for individuals with psychiatric disorders including leveraging of electronic health records systems to promote safety, quality and clinical decision making.

Diana E. Clarke, Ph.D., M.Sc. is the Research Statistician and Psychiatric Epidemiologist with the American Psychiatric Association Division of Research and the American Psychiatric Foundation, and an Adjunct Assistant Professor in the Department of Mental Health at Johns Hopkins Bloomberg School of Public Health. Her work with the APA over the past 6 years has centered on designing and implementing the DSM-5 Field Trials and conducting research studies using data from a variety of sources to help inform the DSM-5 revision process, serving as a member of the DSM-5 Gender and Cross-cultural and Impairment and Disability study groups, and participating in research studies aimed at understanding the impact of integrating mental health into primary care as well as Health Care Reform and the Affordable Care Act in the US. Dr. Clarke's research interests centers on the mental health disparities, epidemiology of mental disorders, and on obtaining accurate assessments of mental illnesses such as depression, apathy, dementia and suicidal thoughts and behaviors and their predictors.

Keila Barber, M.H.S. currently serves as the Survey Operations Manager at the American Psychiatric Association Foundation where she works with fellow researchers to help inform the public and advocate for issues surrounding mental health. Her primary research interest involves suicide prevention in individuals with mental disorders. She received her Master of Health Science in Mental Health from Johns Hopkins Bloomberg School of Public Health.

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Fig. 1.
Psychiatrists' comfort with using computers for various functions by age (N = 152)

Table 1

Proportion of patients seen by psychiatrists in solo/group office, clinic, or hospital/other settings by psychiatrist age categories (N = 152)

	Psychiatrists' age						Test statistic ^a
	< 50		50-64		65		
	%	N	%	N	%	N	
Primary practice setting ^b							
Solo/group office	42.0	21	52.5	32	58.6	17	$\chi^2 = 4.18$
Clinic	36.0	18	21.3	13	20.7	6	
Hospital/mixed/other ^c	22.0	11	26.2	16	20.7	6	

p < 0.001;

**
p < 0.01;

*
p < 0.05

^a
df = 4

^b Primary practice setting has been defined as where the respondent treats greater than 50 % of their patients in the specified location

^c Hospital/mixed/other includes hospitals, nursing facilities, residential treatment settings, and mixed settings (i.e., patients are seen in multiple locations with none of the settings meeting the "greater than 50 % of patients" criterion)

Psychiatrists' comfort with using computers for clinical, professional educational, and personal tasks by primary practice setting^a (N = 152)

Table 2

	Do not use/not comfortable using computers		Somewhat to very comfortable using computers		Test statistic ^b
	%	N	%	N	
Comfort using computers for clinical purposes					
	35.8	24	64.2	43	$\chi^2 = 8.3^*$
	10.8	4	89.2	33	
	21.2	7	78.8	26	
Comfort using computers for professional educational purposes					
	10.8	7	89.2	58	$\chi^2 = 5.4$
	0	0	100	37	
	3.2	1	96.8	30	
Comfort using computers for personal use					
	3.1	2	96.9	63	$\chi^2 = 0.82$
	2.7	1	97.3	36	
	6.4	0	93.6	29	

p < 0.001;**
p < 0.01;*
p < 0.05^aPrimary practice setting has been defined as where the respondent treats greater than 50 % of their patients in the specified location^bdf = 2^cHospital/mixed/other includes hospitals, nursing facilities, residential treatment settings, and mixed settings (i.e., patients are seen in multiple locations with none of the settings meeting the "greater than 50 % of patients" criterion)

Psychiatrists' routine use of computers (i.e., for over 20 % of patient caseload) for specific clinical tasks, and by age (N = 152)

Table 3

Clinical Tasks	Psychiatrists' age		Use of computers for specific clinical tasks for over 20 % of patient caseload		Use of computers for specific clinical tasks for over 20 % of patient caseload		Cochran–Armitage trend test: exact 2-sided
	%	N	%	N	%	N	
Internet search for general clinical information	51.4	75	Age < 50	71.1	37	37	Statistic Z = 4.44***
			Age 50–64	50.0	32	32	
			Age 65+	20.0	6	6	
Electronically document encounters	58.3	84	Age < 50	75.0	39	39	Statistic Z = 4.29***
			Age 50–64	60.3	38	38	
			Age 65+	24.1	7	7	
Electronic patient assessment	16.4	24	Age < 50	30.8	16	16	Statistic Z = 3.46***
			Age 50–64	10.9	7	7	
			Age 65+	3.3	1	1	
Access online treatment algorithms	16.0	23	Age < 50	28.8	15	15	Statistic Z = 3.57***
			Age 50–64	12.5	8	8	
			Age 65+	0	0	0	
Access read-only patient information	40.4	59	Age < 50	65.4	34	34	Statistic Z = 5.08***
			Age 50–64	34.4	22	22	
			Age 65+	10.0	3	3	
Electronically order laboratory test	26.9	39	Age < 50	38.5	20	20	Statistic Z = 3.03**
			Age 50–64	26.6	17	17	
			Age 65+	6.9	2	2	
Electronically prescribe	44.5	65	Age < 50	57.7	30	30	Statistic Z = 3.22**
			Age 50–64	45.3	29	29	
			Age 65+	20.0	6	6	
Electronically communicate with patients	21.2	31	Age < 50	32.7	17	17	Statistic Z = 2.57*
			Age 50–64	17.2	11	11	
			Age 65+	10.0	3	3	
Access online patient educational materials	40.4	59	Age < 50	53.8	28	28	Statistic Z = 3.47***

Clinical Tasks	Psychiatrists' age		Use of computers for specific clinical tasks for over 20 % of patient caseload		Use of computers for specific clinical tasks for over 20 % of patient caseload		Cochran–Armitage trend test: exact 2-sided
	%	N	%	N	%	N	
Electronically communicate with clinicians				Age 50–64	42.2	27	Statistic Z = 4.58 ***
				Age 65+	13.3	4	
		54	37.5	Age < 50	58.0	29	
				Age 50–64	35.9	23	
				Age 65+	6.7	2	

*** p < 0.001;
** p < 0.01;
* p < 0.05

Table 4

Psychiatrists' routine use of computers (i.e., for over 20 % of patient caseload) for specific clinical tasks by primary practice setting^a where majority of patients are seen (N = 152)

		Use of computers for specific clinical tasks for over 20 % of patient caseload		Test Statistic ^b
		%	N	
Internet search for general clinical information	Solo/group	52.9	37	$X^2 = 2.3$
	Clinic	40.5	15	
	Hospital/other ^c	57.6	19	
Electronically document encounters	Solo/group	41.2	28	$X^2 = 8.3^{***}$
	Clinic	78.4	29	
	Hospital/other ^c	66.7	22	
Electronic patient assessment	Solo/group	11.4	8	$X^2 = 5.80$
	Clinic	27.0	10	
	Hospital/other ^c	9.1	3	
Access online treatment algorithms	Solo/group	14.3	10	$X^2 = 0.77$
	Clinic	10.8	4	
	Hospital/other ^c	18.2	6	
Access read-only patient information	Solo/group	18.6	13	$X^2 = 26.0^{***}$
	Clinic	64.9	24	
	Hospital/other ^c	54.5	18	
Electronically order laboratory test	Solo/group	10.1	7	$X^2 = 16.1^{***}$
	Clinic	43.2	16	
	Hospital/other ^c	33.3	11	
Electronically prescribe	Solo/group	28.6	20	$X^2 = 13.6^{**}$
	Clinic	64.9	24	
	Hospital/other ^c	48.5	16	
Electronically communicate with patients	Solo/group	28.6	20	$X^2 = 6.4^*$
	Clinic	10.8	4	
	Hospital/other ^c	12.1	4	
Access online patient educational materials	Solo/group	40.0	28	$X^2 = 0.01$
	Clinic	40.5	15	
	Hospital/other ^c	39.3	13	
Electronically communicate with clinicians	Solo/group	29.0	20	$X^2 = 5.2$
	Clinic	51.3	19	
	Hospital/other ^c	37.5	12	

p < 0.001;

**
p < 0.01;

^{*}
p < 0.05

^aPrimary practice setting has been defined as where the respondent treats greater than 50 % of their patients in the specified location

^b
df = 2

^cHospital/mixed/other includes hospitals, nursing facilities, residential treatment settings, and mixed settings (i.e., patients are seen in multiple locations with none of the settings meeting the “greater than 50 % of patients” criterion)