

Readiness of telepsychiatry health-care institutions in KwaZulu-Natal to implement

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Correspondence: Jennifer Chipps, Department of Telehealth, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Pvt Bag 7 Congella 4013, Durban, South Africa (Fax: +27 3 1260 1543; Email: chipps@ukzn.ac.za) additional infrastructure and support from the KwaZulu-Natal Department of Health (DOH) and health managers. We have therefore conducted an assessment of e-health readiness⁶ to determine where best to start telepsychiatry and what additional infrastructure and support might be required

Summary

We assessed the preparedness of health districts and designated hospitals in the KwaZulu-Natal (KZN) province for proposed telepsychiatry services. An e-health readiness questionnaire for developing countries was administered to managers of health districts and managers of designated psychiatric hospitals by telephone interview. Ten of the 11 district managers and managers/medical officers of 45 of 58 designated hospitals were interviewed. Notwithstanding some concerns regarding the tool, low levels of e-health readiness were found. District managers recorded e-health readiness scores of 137–217 out of 300. This was similar to the hospital managers, who recorded readiness scores of 121–260 out of 300. For telepsychiatry to succeed in KZN, an awareness programme will be required to facilitate the necessary change management.

Introduction

Tele-education services are well-developed in the KwaZulu-Natal (KZN) province of South Africa,^{1,2} although there are few telemedicine clinical services. In KZN there are 32 psychiatrists in the public sector providing public psychiatric services for about eight million people,³ only a quarter of the number of psychiatrists required by national norms.⁴ The province has eight specialist psychiatry hospitals, and 63 district and regional hospitals.

Historically, mental health services in South Africa have been centred on a few large mental hospitals and stand-alone clinics. Selected hospitals provide mental health services and admit patients for 72-hour observation. Psychiatrists from referral hospitals offer clinical and educational outreach services to the designated hospitals, but this service is not comprehensive. In KZN, fifty (70%) of the district and regional hospitals have been designated³ but they are often understaffed, lack psychiatrists and psychiatric care may be substandard.^{3,5} Forty-one of the designated hospitals do not have a resident psychiatrist.

The Department of Telehealth and the Department of Psychiatry at the University of KwaZulu-Natal recently commenced postgraduate education for psychiatry registrars using videoconferencing. This made possible the future introduction of telepsychiatry as a partial solution to the problem of specialist shortages and limited psychiatric outreach. However, introducing telepsychiatry would require

Methods

In 2009, the DOH requested that the 11 district managers in KZN complete an e-health readiness survey by telephone interview. The survey was repeated in 2010 with the 50 designated hospital managers and the eight psychiatric hospital/medical managers. The primary aim of the study was to assess the preparedness of designated hospitals for proposed videoconference-based telepsychiatry. The survey was conducted using a structured e-health readiness questionnaire for developing nations which was developed and validated by Khoja *et al.*⁶ The questionnaire consisted of 60 statements about the preparedness of health-care institutions for telehealth. Permission was obtained from the authors to use the questionnaire and the study was approved by the appropriate ethics committee. Information on infrastructure was collected from hospital managers and supplemented with a Department of Telehealth equipment audit.

The questionnaire has been used in previous e-health readiness studies and has good reliability (Chronbach's alpha = 0.94).⁷ The questionnaire assesses five e-health readiness domains, namely: core, technical, learning, societal and policy readiness (Table 1).

Table 1 E-health readiness domains and sub-domains⁶

Domain	Sub-domains
Core readiness	<ul style="list-style-type: none"> a) Identifying needs assessment; b) Assessing dissatisfaction with the status quo; c) Increasing awareness; d) Comfort e) Trust with e-health technology; f) Strengthening the process of planning; g) Increasing staff satisfaction and willingness; h) Integrating technology with regular services.
Technical readiness	<ul style="list-style-type: none"> a) Speed and quality of ICT/Internet at hospital; b) Service and support; c) Hardware and software; d) Availability and affordability of ICT; e) Institutional access to ICT/Internet training.
Learning readiness	<ul style="list-style-type: none"> a) ICT/Internet training for health-care providers; b) Use of ICT/Internet to enhance education in health care; c) Involvement of health-care providers in telehealth projects.
Societal readiness	<ul style="list-style-type: none"> a) Communication with other hospitals; b) Sharing of locally relevant content between hospitals; c) Providing care to patients in collaboration with other health-care institutions; d) Considering socio-cultural factors among staff; e) Considering socio-cultural factors among clients and communities.
Policy readiness	<ul style="list-style-type: none"> a) ICT related regulations; b) Policies regarding licensure and liability; c) Policies regarding reimbursement for telehealth; d) Awareness and support of ICT among politicians; e) Awareness and support of ICT among policy makers at the hospital level.

Sixty statements of readiness are presented to the respondent who rates them on a five-point Likert scale. Responses ranging from Strongly Disagree to Strongly Agree are coded from 1 to 5, resulting in a maximum score of 300. The maximum score estimates a hospital's stage of e-health preparedness. Scores above 150 were considered to represent moving towards e-health readiness and lower scores to indicate a lack of readiness. Individual statements were also recoded as Ready (3 and above) and not ready (2 and below). Khoja et al. omitted 'don't know' responses from calculations (Khoja, personal communication), but due to improved internal consistency (overall Cronbach's alpha of 0.54 when 'don't know' responses were excluded), 'don't know' responses were assigned a score of 3 on the 1-5 scale, being neutral, neither agreeing or disagreeing. Domain scores were converted to standard scores out of 100. Median values were calculated for individual readiness statements and compared by district, hospital, hospital type and presence of videoconference venue using non-parametric tests. Sub-domain, domain and total scores were tested for normality; means and confidence intervals were calculated and compared using independent *t*-tests and ANOVA or Kruskal-Wallis one way analysis of variance.

Results

Ten out of the 11 district managers completed the questionnaire. Data collection was difficult as managers were not readily available, often did not have the information required, were not familiar with specific matters raised, and commonly stated that they could not provide comments on behalf of other people such as politicians. The wording of some statements was found to be problematic as 16 out of the possible 60 statements implied a 'proposed telehealth project' which at the time of the interviews in 2009 did not exist. This resulted in 8% of the 10 district managers' responses (45/600) being 'I don't know', with 24 of the 45 (53%) being in the policy readiness domain.

Forty-one managers of the 50 designated hospitals and four managers of the eight psychiatric hospitals completed the questionnaire, i.e. responses from a total of 45 hospitals (78%). Responses were received from hospitals in all 11 districts with response rates varying from all hospitals (3/3) in a peri-urban district to only one of five designated hospitals in a remote rural district. Thirty-one hospitals were district hospitals, four were specialist psychiatric hospitals and 10 were regional or tertiary hospitals. In comparison with the district manager's audit, only 0.7% of the statement responses (187) were 'I don't know', but again 47% of these (87/187) were in the policy readiness domain.

Infrastructure

Sixteen hospitals (36%) reported having dedicated computers with Internet access for staff education (mean 4.7 computers per hospital). However, there were differences in distribution between regional and district hospitals, with the median number of computers being nine and three respectively. Thirty hospitals reported having a videoconference venue, with venues being able to seat up to 80 people (median 40). Only 19 managers knew the available ISDN bandwidth for videoconferencing, which ranged from 128 kbit/s at 13 hospitals to 384 kbit/s or more at six hospitals providing multipoint videoconferencing.

Internal consistency

The questionnaire had high internal consistency for both the district and the hospital managers' questionnaires, with an overall Cronbach's alpha of 0.93 (societal 0.70, policy 0.70, learning 0.74, technical 0.73 and core 0.94), and 0.94 (societal 0.75, policy 0.87, learning 0.77, technical 0.82 and core 0.88) respectively.

Overall e-health readiness

District managers recorded maximum e-health readiness scores of 137 to 217 (mean 186, SD 25) out of 300 (Table 2). This was similar to the hospital managers, who recorded maximum readiness scores from 121 to 260 (mean 181, SD 31) out of 300. Thirty-five of the 45 hospitals appeared to be moving towards readiness with scores of more than 150 (Table 3), with the top four hospitals being hospitals with current telehealth activity.

Table 2 Overall district e-health readiness. Scores above 150 suggest moving towards readiness and scores of 150 or less suggest a lack of readiness

District	Score
1	137
2	154
3	172
4	183
5	191
6	196
7	198
8	202
9	210
10	217
Mean	186

J Chipps and M Mars Readiness for telepsychiatry Table 4

Hospital rank	District rank	Top 10 readiness statements	Domain
1	5	Use of ICT will benefit men and women equally.	Societal
2	4	A referral system is available between this institution and other health-care institutions to provide patient care in certain specialties.	Societal
3	16	Both the genders have equal and unrestricted access to the technology.	Societal
4	14	There is a willingness among staff to implement the technology for its intended purpose.	Core
5	10	There is general dissatisfaction with current handling of issues that could be addressed through telehealth/e-health.	Core
6	3	Staff regularly use ICT/Internet to communicate with staff at other health institutions in the region.	Societal
7	11	Awareness of ICT and the Internet's role in health care exists among planners.	Policy
8	21	Programmes exist for continuous education.	Learning
9	17	People from all socioeconomic strata obtain direct benefit from the use of technology.	Societal
10	13	The proposed technology is appropriate according to the conditions within the organization.	Societal

District managers reported the highest level of readiness for individual statements measuring general commitment to societal and gender readiness, while the lowest readiness was reported in policies, technical readiness and planning. Hospital managers also reported most readiness for individual statements measuring general commitment to societal and gender readiness in hospitals (Table 4) with the lowest readiness reported in policies and planning (Table 5). Although these ratings showed consistency between hospital and district managers, they also reflected the different priorities of districts and hospitals.

There were no significant differences in maximum e-health readiness scores between different districts, different hospitals and different types of hospitals. There were no significant differences between hospitals with or without videoconference facilities. There were no significant differences between the standard scores of hospitals and those of districts. However, within both the districts and hospitals there were significant differences between the subdomains of societal readiness and technical readiness (Figure

Table 3 Overall hospital e-health readiness (total score). Scores above 150 suggest moving towards readiness and scores of 150 or less suggest a lack of readiness

District hospitals		Regional hospitals		Psychiatric hospitals	
No	Score	No	Score	No	Score
1	101	1	85	1	132
2	103	2	119	2	139
3	103	3	154	3	166
4	113	4	164	4	173
5	127	5	169	Mean	153
6	132	6	171		
7	133	7	177		
8	136	8	194		
9	138	9	205		
10	139	Mean	160		
11	140				
12	145				
13	148				
14	150				
15	159				
16	166				
17	167				
18	170				
19	172				
20	180				
21	185				
22	186				
23	187				
24	188				
25	190				
26	190				
27	197				
28	218				
29	229				
30	231				
31	247				
Mean	164				

Table 5 Lowest ranking of readiness by individual statements

Hospital rank	District rank	Top 10 readiness statements	Domain
51	58	Institutional policies are in place to deal with liability.	Policy
52	51	There is an appropriate plan for implementation of telehealth/e-health initiatives.	Core
53	49	Government policies are in place to deal with liability.	Policy
54	59	Government policies are in place to ensure proper reimbursement to the health-care providers.	Policy
55	26	Personnel and programmes are in place for training.	Learning
56	54	Staff regularly use ICT/Internet to communicate with the local community and clients.	Societal
57	36	Manpower is in place to train users for project.	Technical
58	55	Institutional policies are in place to ensure proper reimbursement to the health-care providers.	Policy
59	41	There is an appropriate plan for evaluation of telehealth/e-health initiatives, including options for external evaluation.	Core
60	48	Other institutions involved in the telehealth/e-health project have also planned to go through e-readiness assessment.	Core

Core e-health readiness significant

The mean standard core e-health readiness score was 61 (SD 14) for all districts and 63 (SD 12) for all hospitals. There were no significant differences for core readiness for hospital type, district, or hospitals with or without videoconference facilities.

The median ratings of the perception that proposed telemedicine programmes for hospitals were appropriate according to the conditions within the hospital were lower. There were significant differences for two core sub-domains. The first was between hospital types for dissatisfaction with the status quo ($P = 0.05$), with psychiatric hospitals reporting less dissatisfaction than other hospitals ($P = 0.04$). The second difference was between hospitals with videoconference equipment and those without for the sub-domain awareness of the role of ICTs in health planning ($P = 0.02$), due to the low rating of hospitals without videoconference facilities.

The median ratings of the perception that proposed telemedicine programmes for hospitals were appropriate according to the conditions within the hospital were lower in regional hospitals ($P = 0.04$). There was a significant difference in median rankings of comfort with using ICT/Internet or technology ($P = 0.03$) between districts due to a low median rating from a very rural district.

Technical readiness

The mean standard technical e-health readiness score was 50 (SD 13) for all districts and 55 (SD 14) for all hospitals. There were no significant differences for the domain of technical readiness for hospital type, district, or hospitals with or without videoconference facilities. There were no significant differences for sub-domain or individual statements.

Learning readiness

The mean standard learning e-health readiness score was 59 (SD 14) for all districts and 55 (SD 17) for all hospitals. There were no significant differences for learning readiness for hospital type, district, or hospitals with or without videoconference facilities. There were no significant differences for sub-domain or individual statements.

Societal readiness

The mean standard societal e-health readiness score was 71 (SD 9) for all districts and 64 (SD 12) for all hospitals. There were no significant differences for societal readiness for hospital type or district.

There was a significant difference between hospitals with or without videoconferencing facilities for the sub-domain of sociocultural factors among clients and communities ($P = 0.001$). The two statements on benefits from ICT for society were rated significantly lower by hospitals with no videoconference facilities for both gender ($P = 0.002$) and socio-economic strata ($P < 0.001$).

Policy readiness

The mean standard e-health policy readiness score was 67 (SD 8) for all districts and 59 (SD 12) for all hospitals. There were no significant differences for policy readiness sub-domains or individual statements for hospital type or hospitals. There was a significant difference between districts for the sub-domain on policies regarding reimbursement ($P = 0.03$) due to the statement referring to institutional policies to ensure proper reimbursement to health-care providers ($P = 0.04$). There was also a significant difference in the sub-domain of awareness and support, with more hospitals without videoconferencing venues agreeing with the statement that politicians generally support the use of ICT in health care ($P = 0.02$).

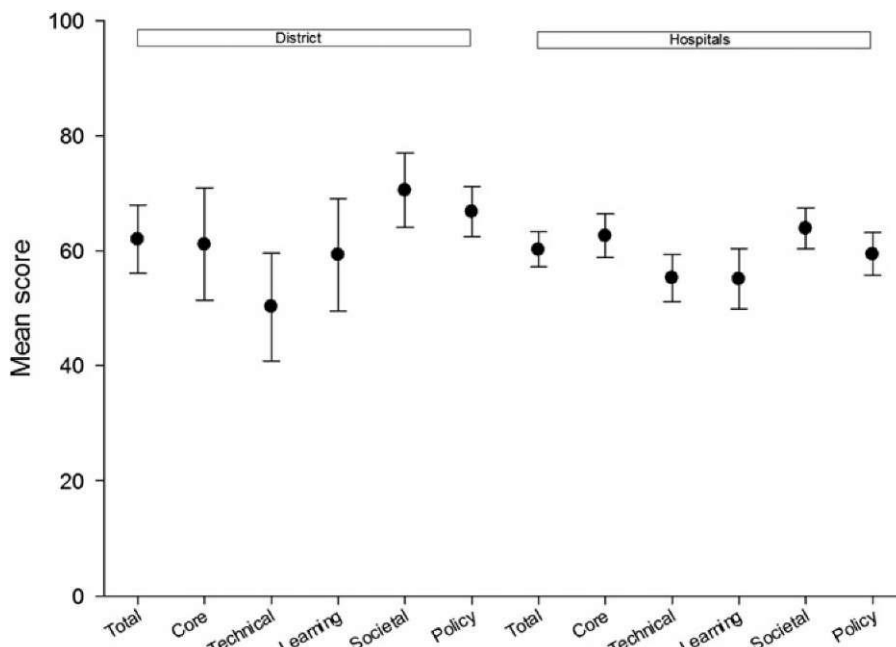


Figure 1 E-health readiness domain mean scores. The error bars represent the 95% confidence intervals

Discussion

The e-health readiness questionnaire was reliable and provided similar reliability to that reported by managers in a previous study.⁷ The audit provided useful information for planning telepsychiatry clinical services, but the findings have to be considered in terms of concerns about the validity of the tool for district level managers. When the 'don't know' responses were interpreted as neither agree nor disagree, the tool had good overall and domain consistency, but this did not hold if the 'don't know' responses were excluded from the calculations. The high number of 'don't know' response may have been related to the high turnover of managers and the fact that district managers oversee a number of hospitals and may not have had all the detailed information required by the questionnaire. This may need further investigation.

Despite positive factors such as the availability of telemedicine and tele-education in the province and previous e-health awareness campaigns for district managers, the districts had relatively low total e-readiness scores. Even though a successful tele-education programme for psychiatric registrars was established in the province in 2009, the e-health readiness assessment confirmed concerns about the level of planning and understanding of e-health requirements by hospital managers, in both specialist and designated psychiatric hospitals. While there appeared to be agreement on awareness and support of telehealth among policy makers at a hospital level, the district and hospital managers appeared poorly informed on policy matters such as regulations on

reimbursement. This probably results from the absence of an e-health policy in South Africa as a whole.

Poor readiness was reported for planning of telehealth initiatives at the district and hospital level. Although this may be accurate, the wording of the questionnaire statements on planning for e-health projects implied an existing ICT or e-health plan. However, there was no e-health policy in the province and most infrastructure planning in the province is done centrally and not at a district level. This contradiction between the implication of the statements and the status quo may have negatively affected the responses.

Technical readiness was the domain rated as least ready. This confirms our experience, as technical support and maintenance of telehealth facilities is provided by the university medical school and not by the DOH.

Conclusion

Even though the uptake of tele-education in psychiatry is in line with other specialties,² the findings from the present survey show that district and hospital managers are ill prepared for e-health projects. For telepsychiatry to succeed in KZN, an awareness programme will be required to facilitate the necessary change management. Unless this is done, it is unlikely that any proposed telepsychiatry programmes will succeed.

Acknowledgements: We thank the Department of Health for their assistance in conducting the audit.

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