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Staff attitudes towards follow-up and screening via the patient's smartphone, exemplified by a questionnaire for self-rating of depression symptoms.

Abstract

The health care system is in need of new cost-effective tools. How would the health care be affected if the primary care units would receive questionnaire results from the patient's smartphone? Interviews on this topic were performed with focus groups containing primary health care staff at Hagfors Primary Care Centre in Sweden. An android app based on the questionnaire MADRS-S has been used as an example during the interviews. The recordings were examined using qualitative content analysis. The project shows different potentials in digital questionnaires and what changes this may entail.

Background

In Sweden, the lifetime prevalence of depression is estimated to be 13.2% among men and 25.1% among women[1]. There is a well-established correlation between suicide and mood disorders[3]. It has been estimated that 50–80% of completed suicides are associated with mood disorders[3]. Suicide is the leading cause of death among men between the ages of 15 and 44 in Sweden[5]. Nevertheless, it is estimated that just over 2/3 of all suicide cases had recently been in touch with the health care. Only 1/3 of all suicide cases had contact with a psychiatric clinic[4]. In many cases, the suicide could have been prevented if adequate efforts had been made[2]. Guidelines for the treatment and follow-up of depression exist, but the increase in mental problems among young people poses a major challenge[15, 16].

Thus solving the difficult situation require new ways of dealing with depression. Some smartphone apps have been developed for the purpose of

benefiting the health care of depressed patients. The apps could be categorised into two groups depending on what end-user they are meant for. If the end-user is a patient, then the app helps the patient to track and understand the symptoms through a mood diary[8]. If the app is meant to be used by health care staff, then the app is constructed around different questionnaires[9]. Both approaches may result in somewhat better results for the patient, but by focusing on either the patient or the staff a key aspect is neglected. In order for the health care staff to help the patient as good and effective as possible, it is necessary to focus on the communication between both parties.

Purpose

In order for the health care staff to give the depressed patient adequate help, the staff needs adequate information about the patient. In investigations of somatic pathologies, adequate laboratory tests are usually done before an appointment. What if the patient's mood could be measured in a similar way before an appointment? With the purpose of enhancing the communication between the patient and health care staff an app prototype (eMADRS) for android smartphones has been developed by the first author[12, 13]. The app is thought to be used by the patient in order to send a mood evaluation to a phone number owned by a trusted person or organisation, e.g. a health care unit. The app consists of a MADRS-S form. The result is sent as an SMS text message to a phone number, that is previously set by the patient. MADRS-S is a verified tool commonly used for screening and follow-up of depression[10, 11]. It consists of nine questions. The patient answers each question with a rating from zero to six. The total score from all questions is categorised as follows:

score	severity of depression
0–6	no depression
7–19	mild depression
20–34	moderate depression
35–54	severe depression

The research-topics are three areas, closely bound up with each other:

- α What advantages and disadvantages are identified from a professional clinical perspective, using a digital evaluation instrument for depression in screening and follow-up?
- β The aim is also to collect proposals for further development of eMADRS.
- γ What staff categories would be most affected by digital questionnaires?

Materials and Methods

In order to get a holistic picture of how a primary care unit would be affected by digital questionnaires, many staff categories were interviewed[14]. Two focus groups were formed, consisting of seven respectively six primary care unit employees from different staff categories that are directly or indirectly involved in the treatment of depression at Hagfors Primary Care Centre in Sweden. The following table is a compilation of the group members:

Group	Work title	Interview 1	Interview 2
A	Administrators	1	1
	Nurses	3	3
	Foot therapists	1	0
	Physicians	0	1
	Psychotherapists	1	1
B	Administrators	1	1
	Auxiliary nurses	1	2
	Nurses	0	1
	Physician assistants	1	1
	Psychotherapists	1	1

Two 30-minutes long interviews were performed with each group. During the interviews the following questions were discussed:

Interview 1

1.1. What is specific, measurable and achievable in your work?

Interview 2

2.1. Describe how you experience your work situation when a patient's major issue is not related to depression, but the patient seems to be in a very sad mood?

2.2. Scenarious are discussed:

- What if eMADRS only could be used for follow-up?
- What if eMADRS could be used by everyone to send you mood evaluations?
- What if the result of eMADRS automatically could regulate what lab-tests should be performed?

The interviews were then analysed using qualitative content analysis[18]. From the recordings, causation codes were derived and categorised. The work was done with the help of the programming language library RQDA[19].

Results

Research topic α and β: Around the example EMADRS the following potentials, strengths and weaknesses were identified:

- EMADRS could be very useful for following up patients that are at risk of relapse of depression.
  Code name in appendix: ***emadrs_in_dev_only_follow_up***

- There is a need for digital tools with validated questionnaires for a broader spectrum of pathologies.
  Code name in appendix: ***emadrs_in_dev_screening_follow_up***

- These questionnaires should be connected with each other in a controlled way.
  Code name in appendix: ***emadrs_in_dev_controll***

- EMADRS could reduce the work load of the administrators.
  Code name in appendix: ***emadrs_already_(+)_less_paper_work***

- Important that someone should be responsible and accountable for the incoming questionnaire results.
  Code name in appendix: ***emadrs_already_(+)_possebility_to_check***

- EMADRS should not be used in the process of diagnosing depression.
  Code name in appendix: ***emadrs_not_in_dev_everybody_diagnostic***

- EMADRS should not be possible to use by everyone in order to send the results to the health care provider.
  Code name in appendix: ***emadrs_not_in_dev_everybody_too_many***

Research topic γ: In effective organisations the management is distinguished from the leadership[17]. The essence of leadership is knowing what to desire, while management means knowing how to realise the desires. Below is a table describing what staff categories according to the interviews, are managing or leading in their work:

Tasks of contacting the patient, that imply leadership Coding in appindix: leadership_contact_patient	• assistant physician • auxiliary nurse • foot therapist • nurse • nurse COPD • nurse DM2 • nurse geriatric • physician • psychotherapist
Tasks of contacting the patient, that imply management Coding in appindix: management_contact_patient	• administrator • nurse • psychotherapist
Tasks of feeling empathy, that imply leadership Coding in appindix: leadership_empathy	• administrator
Tasks of contacting staff, that imply management Coding in appindix: management_contact_staff	• foot therapist
Managing finances Coding in appindix: management_financial	• administrator
Tasks of maintaining patient's health, that imply managing the patient Coding in appindix: management_medical_practice_patient_part	• foot therapist • nurse COPD • nurse DM2
Tasks of maintaining patient's health, that imply managing other professionals Coding in appindix: management_medical_practice_staff_part	• assistant physician • auxiliary nurse • nurse COPD • nurse DM2 • nurse geriatric • physician • psychotherapist
Tasks of managing medical records Coding in appindix: management_medical_record	• administrator

Digital questionnaires are a way to *manage the communication with the patient*. According to the table above, the staff categories that are working with that task are: nurses, administrators and psychotherapists. Thus those staff categories would probably be most affected by the digital questionaires.

Discussion and Conclussion

This study was based on the example of a digital version of the questionnaire for depression evaluation, called MADRS-S. The staff's attitude to digital questionnaires on the patient's smartphone was assessed in two focus-group-interviews at Hagfors Primary Care Centre in Sweden. The results show that the staff has a positive attitude to digital forms on the patient's smartphone. They think that screening and follow-up through such tools would probably be beneficial for the work at the health centre. The results show that there should be a possibility for healthcare professionals to control which questionnaires the patient sends to the healthcare. As for the digital version of MADRS-S, the form should be used primarily for follow-ups. Thus after understanding the patient's needs during the first meeting, digital tools like eMADRS could be used for monitoring the diseases. Hopefully IT solutions could ease the heavy administrative workload that medical professionals struggle with[26]. The categories of personnel whose work would be most influenced by digital forms are nurses, administrators and psychotherapists. By reducing the administrative burden the healthcare professionals could focus more on the interaction with the patient.

In the medical *information technology* (IT) debate of today, the topic of discussion is too often about what parts of the physician's work could be taken over by machines[25]. Based on the argumentation above I suggest that the question instead should be – What IT solutions can help the doctor to better understand the patient's situation? In 1875 the first diagnostic biopsy was performed by Rudnev in Russia [23]. Since then, the number of examination methods that do not require directly meeting the patient has increased at an accelerating rate. At the same time, the medicine has become algorithmic in approach. Now, thanks to the evolution of information technology(IT) the medical practice becomes more and more computerised. Despite this development, the meeting between the patient and the physician is still an essential part of the practice of medicine. One characteristic of the medical work, that cannot be automated or putting into algorithms is empathy. In order to take responsibility, the physician has to be empathic. By being empathic, the physician understands the patient's needs. Then the physician can respond to the needs so that the patient understands the condition and what treat-

ment options there are. In other words, a physician empowers and teaches the patient. Hence physicians are often called "doctor", which derives from the Latin docēre, meaning to teach[24]. Digital questionnaires can hopefully give medical staff more opportunities to focus on understanding and responding to the patient's needs.

Limitations

By using qualitative content analysis, professional-specific insights have been made. Thanks to the working method of focus groups, the participants have been able to discuss these insights together. This has resulted in good answers to the questions given. A major weakness of the study is that interviews were conducted at only one health care center. It is therefore difficult to accurately say what parts of the results also apply to other health care centers. For further development of digital tools, more research is therefore desirable.

Implications

For at least the last seven years, the county councils' expenses have increased by approximately 5% per year. Adjusted for inflation, it will be approximately 3% per annum[6, 7]. The strategies in health care must change. Hopefully, this project can be a step in the right direction. The results show new ways to improve the communication between the health care system and the patient. In order to foresee shifts in work load that the new digital tools could lead to, further scientific work has to be done. This is important as economic benefits could only be gained if the work tasks would change, since the finances are a mirroring of what work has been done.

Ethics

The project's character is developmental work within the clinic. Therefore, the project has been approved in terms of confidentiality and safety by the Head of Operations at Hagfors Primary Care Centre in Sweden. The project does not fall under the Ethics Review Act's research definition.

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