# Health information officers' views of mental health information processing and utilisation within an integrated primary healthcare service in Cape Town, South Africa

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## Abstract

Health facility information officers have significant roles in gathering and processing health information and communicating it for utilisation. The purpose of this study was to explore the views of health information officers in processing and utilisation of mental health information within the context of primary health care. Fourteen health information officers were selected using purposive sampling techniques; they were interviewed, and data were grouped into themes. The study revealed a lack of structured information validation and feedback systems to improve the quality of information processing, and facility-level mental health information processing was fragmented and not used to improve service outcomes. Staff involved in health information recording and processing had limited skills to fulfill these tasks, and there were barriers to collecting and processing mental health information. These findings have major implications in improving mental health services within the integrated primary mental healthcare services, and in developing a sound and strong mental health information system.

## Introduction

Access to structured and comprehensive information and communication is critical for appropriate care and treatment of mental health patients. The use of information and communication technology enabled mental health management systems to decrease re-hospitalisation of patients who have cooperative family support (Spaniel et al., 2008). Knight (1995) notes that information management systems offers healthcare providers an opportunity to improve standards of patient care, not only by accessing and exchanging relevant information on the individual patient, but also by immediate access to patient information and up-to-date research in the field.

Mental health information resources should provide a vital and reliable picture of a country's mental health system and mental health needs (WHO, 2005a). Mental Health Information Systems (MHIS) are useful in improving mental health outcomes through accessing and sharing up-to-date evidence-based information. They inform service planning; policy development and clinical practice; promote patient safety; and improve communication at discharge (WHO, 2005a). A variety of health information technology tools can be applied to meet the challenges of medication management and adherence, care coordination, and management of comorbid conditions in behavioural health (US Department of Health and Human Services, 2012). Evidence has shown that health professionals and policy-makers in Africa lack access to the information needed to make evidence-based decisions for effective health care (Pakenham-Walsh & Bukachi, 2009). A similar study indicates that despite increased Internet connectivity and widespread use of mobile phones in sub-Saharan Africa, the region suffers from a lack of health information (Gebremichael & Jackson, 2006). At district level, many healthcare providers lack reliable information for monitoring and planning mental health services. Often the information at district health facility level is fragmented while, at higher levels, policy-makers lack timely, relevant data on which to base their decision making (Pakenham-Walsh & Bukachi, 2009).

The role of health information officers is gathering and processing data from the point where it is collected to where it can be collated and prepared for analysis of the data, and communication of the results of analysis for use by staff for planning service delivery improvements (WHO, 2005a). It is a sustainable method of gathering, analysing, disseminating and using information that is built into the workings of mental health services. The movement of information begins with the collection and compilation of information by health workers at the service point. The Health Information System (HIS) regional coordinator enters the data on a computer, and forwards the data in electronic format to the provincial level HIS directorate. The HIS regional coordinators also generate a summary/feedback and return this to the district/regional mental health coordinators. They then return the clinic summaries back to the clinic head nurse, who in turn forwards them on to the mental health workers (WHO, 2005a). At each point action must be taken regarding various aspects of planning, management and service delivery, depending on the service level (WHO, 2005a).

Information flow requires channels and a networking system. In principle, health information should flow in both directions (vertically from health facilities to provincial and national levels and back to health facilities in the form of feedback; horizontally to other health facilities in the form of a transfer/referral system). However, lack of information sources, poor coordination and fragmentation of information make this flow difficult in African countries.

Despite the tremendously important effects and value of information sharing on mental health service improvement, more than 24% of countries do not have an information system for collecting, processing and sharing basic mental health information (WHO, 2009). There is a lack of accurate, routinely collected data regarding current mental health status, service provision and resources, and little use of data collected from services for mental health policy and planning (Lund, Kleintjes, Kakuma, Flisher & MHaPP Research Programme Consortium, 2010). MHIS improves the effectiveness and efficiency of the mental health services and ensure more equitable delivery (Moore, Wisnivesky, Williams & McGinn, 2003). Common standard information technology allows local information systems to communicate across organisational and geographical boundaries as people with mental disorders move around. The purpose of this study was to explore the views of health information officers about mental health information processing and utilisation at district health facility level.

**Methodology**

*Study design*

The study employed a qualitative approach to explore and describe health information officers' views of mental health information processing and utilisation. This study was conducted Cape Town Metro area in the Western Cape of South Africa, which has about 41 day hospitals, health centres and clinics that provide mental health services. Of these, 14 health facilities were selected for inclusion in the study. The study received ethical clearance from the university ethics committee and permission to use the health facilities for study was obtained from the provincial Department of Health. An information sheet was given to the participants and the purpose of the study and implications of participation were explained to them. The written consent form stipulated that information obtained from them was to be kept anonymous throughout the study and thereafter. The privacy and dignity of the participants were respected, and their judgements and opinions remained strictly anonymous. Names and other identifiers were changed to protect the privacy of the participants. The consent of participants was voluntary and made with full understanding of the implications of participation. The participants were also informed that the information would be recorded by tape-recorder. It should be noted that the position of information officer was created a year before the data collection period. As a result, most of the health information officers had less than a year of experience in the position, although some had additional experience as a clerk/receptionist in the same health facility or other similar facility. Purposive sampling was employed to select those who had more experience in the field of health information recording and processing. Data saturation consensus was reached at fourteen health information officers' interviews.

An interview guide was developed through consultation with experts, and modifications were incorporated into the final interview guide after a pilot study. The interview guide questions were in English and carefully worded in simple language so that participants could easily understand them in answering the questions, with probes being used when required.

*Data collection and analysis*

Data were collected using individual semi-structured interviews with 14 participants, held at times and locations convenient to them. Participants were allowed to ask questions for clarity before they signed the consent form. The participants were allowed to express their feelings, views and experiences in collecting and processing mental health information. Each interview lasted 40 to 45 minutes. The researchers transcribed the audiotapes and coded the data pool with reference to the research question. Data were analysed using thematic content analysis, whereby themes were generated through repeated reviews of the interview data.

*Trustworthiness*

In ensuring trustworthiness of the study, credibility was achieved through involvement of researchers in the data collection process; transferability was achieved by peer-reviewing of the analysis and probing for researchers' bias, exploring meanings, checking the steps and process of analysis, leaving an audit trail and consulting expertise in the field. Field notes and audiotapes were kept as evidence, and inputs from peers and senior researchers were used to ensure dependability of the research. A data collection protocol was developed to keep an account of the data collection process and analysis and pilot tested to ensure confirmability and clarity.

**Results**

The main emphasis was to obtain participants' views on mental health information processing and utilisation at health facility level. The following themes emerged from the data: there were no structured information validation and audit systems; top-down feedback on analysed information was not carried out as per guidelines; the health information officers have limited skills to analyse the data to be used at facility level; facility-level systems for information analysis and utilisation do not exist; and there were barriers associated with information collection and processing.

**Theme 1: Mental health information validation process at PHC level**

The participants reported the validation process of information at health facility level:

> *". . . You compare the previous month data as well as the month before with the current month and you take the third month and see how I am doing in terms of collecting the information and obviously looking at . . . new client increasing or decreasing." (P6)*

> *"The health facility manager who takes of all that validation and signed off when satisfied with the information and then I send it through to the substructure office. . . . the substructure office also validates and checks, before they send through to the next level; that is how the validation process works." (P9)*

One participant reported that the validation process can also be done by the nurses who are collecting the information before sending it to the health information officer to collate and check for discrepancies, and that the facility manager is the final person to validate the accuracy of the information collected:

> *"The validation of the data would still be done by the mental health nurse on the final analysis before the information is sent to the information officer, then when the information come to me, I will analyse and add up the data to the final point where I got the total patients for that month. I still take that information to the facility manager for a second opinion." (P12)*

The facility manager of every facility should check in case of errors, as there is always the possibility of human error, whether something looks incorrect or if there are gross differences from the previous month's report; a justification should be given before the report is sent to the substructure office.

Participants reported that the validation of statistical information is carried out at the substructure office:

> *". . . what is happening is that the information officer from substructure office gives us the validation of the information, then he will have to comment on that information. For example, last month we had 6 patients for transfer in and this month there were 12. So there were some discrepancies, and the substructure health officer will comment why 6 and 12. In such cases we have to justify why we have so many transfers in or transfer out for this month." (P4)*

> *"What happens is that when auditors come around the hospital and go through the patient statistics, and asks you that he wants hard copies of patient statistics, because he/she wants to trace back. They*

*do it . . . paper trail, and they come to the doctor's tick sheet and they see, but on this tick sheet on Dr 'X' saw 20 folders, that is [they] actually go to the folder numbers, then they try to see that person – however the person wasn't even came to the health facility on that particular day. In this case the auditor general will hold that doctor responsible for recording inaccurate patient statistics." (P7)*

The monthly mental health statistical report comprises new mental health clients as well as old mental health clients seen at the health facility every month. For instance, if the total number of mental health clients reported every month was 60, and the number for the current report was higher, then a re-check would have to be done to find the error or reasons:

*". . . the facility manager looks through all the patient statistics collected, but when the number of patients is so high last month or low, I always go to the clinical staff and ask them if there are so many patients last month and low in this month. Why is it low, there is always a reason to explain. Perhaps the reason could be a lot of patients default or interrupt." (P11)*

**Theme 2: Mental health information flow and feedback**

The information prepared on the routine monthly report (RMR) is sent to the facility manager for validation of the data and signature. Once the validation is done and signed by the facility manager, the RMR is sent back to the information clerk, from where it is dispatched to the substructure office. The substructure office does its own validation process before the RMR is dispatched to the District Metro Health Office. In the case of errors or inconsistencies, the data will be sent back to the health facility to rectify the errors or provide justifications. However, this was reported as a day-to-day challenge for both facility managers and information officers in identifying where the discrepancies or errors were created, which in turn created tension between the clinical staff and management. The following extract from the data illustrates this process:

*". . . every month the report sends to the substructure office; in case of under/or over- reporting or errors, the report comes back for justification or correction. Justification should be provided why there was less or more number of patient visits reported. Once the information is in order at substructure office, then it is sent to the District Metro Health Service, and from there the data is forwarded to the provincial information management unit and to national." (P9)*

Most data are analysed at provincial level, and the results of this analysis are expected to be sent back to the health facility as a form of feedback for

utilisation. Data that are required at national level would be sent to the National Department of Health Information System (HIS) management unit, where all nine provinces' data are entered into the HIS data base and analysed, with feedback of the results of analysis sent back to each province for implementation.

A lack of feedback on information sent to higher level came out strongly in the interviews. The majority of participants in this study reported that they had not received feedback in the form of analysis results to use for planning and to improve patient care. However, the health facility managers have quarterly meetings with the substructure office, where they discuss and compare their work with their peers in terms of achieving the target. Feedback on the results of the data analysed was not given to the clinical staff and information clerks/officers at ground level, and there was no horizontal information communication or reporting. This also created a concern for the health workers, as they did not know whether what they were doing was reflecting as worthwhile or not. As indicated by one participant:

> *"We don't get feedback from the top for the statistical report that was sent. However, if things are not according to what they think or want, or when it is not right/or not correct, then they will come back to us to look where was the problem. For instance they might discover that the doctors didn't put on death certification of the patient who died of AIDS (that he/she died of this), he put that patient died of natural causes. So there was nothing captured appropriately for the patient died of HIV/AIDS. That is one example of feedback we received." (P10)*

A similar response was obtained from another participant who also reported that feedback was received only when there was an error on the reported information, which was sent back to be corrected:

> *". . . to be specific, I have never get any feedback, the only feedback I got is maybe if there are some discrepancies, when there is something they are not sure of, or doesn't look right. Then they call and say look (there is) something we are not sure of, can you please double check for us? Then I go back to my report, and see the problem. I correct and fix it and I resend." (P3)*

For some participants getting back the statistical report for correction is considered as 'feedback':

> *"They will normally give feedback or email you, when certain things are wrong or for instance if certain numbers are not correct. Feedback*

*when basically something is wrong, they send feedback with that one, but I don't get so much feedback." (P8)*

The following extract further illustrates that the top-down feedback system was poor:

*". . . normally, since I have sent the data to them, I haven't received any feedback. Basically what they are doing with the information is nothing I know of, no feedback was sent to us at the bottom level. The only time we get calls or email from substructure office, (is) when there were discrepancies/error in the reported data." (P14)*

**Theme 3: Information officers' skills in information processing**

Some of the participants reported that they had some knowledge on how to process information:

*"In terms of analysing the information, I have more or less knowledge. I have got training on that and my colleague also trained me quite well before she left on that. I can't say I mastered it, but it is a learning process. I can't really say that I can do graphs, not yet." (P5)*

Others reported that there was not much training given to them on how to analyse the patient health data: *"They do give training on how to check information, to compile tally sheets, all those things, which I think is impacting on the process if the statistics are not analysed." (P3)* However, health information officers from the substructure office had a different view, and expressed their concerns about the health facility information officers' capability to learn computer skills. They reported that although computer training was given to information officers to improve the quality of data capturing and processing, there were still problems with the quality of information:

*". . . we are always giving them training, how to do things. Some of them don't have computer literacy, and they could not understand how to capture data on Excel. Ninety percent of our job is Excel computer software. Information management consultation involves process, and you need people on planning, decision, and problem solving, so nothing is a linear process. It is the whole jungle of work and also to fix before fourth or fifth of every month, you know what I am saying, it also very fragmented." (P1).*
*"There is lack of skills to analyse and interpret data by information clerk. You can't expect the clerk to analyse and interpret the data because it is not in our level to analyse and interpret. But (in terms of ) process, we are obviously getting constant training." (P8)*

The majority of participants emphasised the need for skilled personnel in the information management system. Recording information on computer and processing that information requires skilled persons with a good understanding of the importance of information collection, the ability to interpret data on the computer and to provide meaning to the data. The following extract illustrates the perceived need for computer skills:

> *"I think there are certain aspects that I need to be more competent on the computer skills in terms of completing the data by electronic (means), yes there is still much room for improvement as to me needing to get more experience, be more competent in collecting those. I send report every month; if there seems to be certain queries in that sense, they do send it back to me." (P10)*

According to the employment policy, information management knowledge and skills are a requirement in order to employ information clerks, but this was not the case in practice. Most of the information clerks had been transferred from an archival or patient receptionist position to the information officer position within the same health facility.

**Theme 4: Mental health information use at health facility**

Study participants reported that they did not analyse the data to utilise at health facility and substructure office levels; however, they may examine information in terms of achieving targets and interpret what is happening in the facility on clinical work days: *". . . at substructure office, we do contextualise data . . . meaning we don't really analyse the data but we just look at the target. Nobody is skilled to analyse the data to be used at the facility level." (P2)*. The responses indicated that they do not use the health information much at facility level: *"t is not known what we can do with the data, I don't know what they use it for, but they just say capture this and record this, but they don't know why." (P7)* A similar response from another participant was:

> *". . . we don't analyse the data here, we collect everything required by higher levels and reported to them. We don't put it on the computer system, that is why we keep everything on the hard copy. No adequate knowledge in analysing and utilising information." (P9)*

**Theme 5: Factors influencing quality of information collection and processing**

Some participants reported that the attitude of staff towards capturing and processing patient information was challenging. The health information

management system was new for most of the clinical staff; as a result, clinical staff perceived that collecting information was an additional workload for them:

> *"The staff don't believe capturing patient information is part of their job; they rather see it as an addition to their job, and they believe that information capturing is a tedious job for them. In most cases information recorded in the patient files is not recorded in the statistical form, and this has been the on-going major challenge we have to deal with." (P13).*

Responses from various participants illustrated challenges in collecting quality information:

> *"The main challenge is that the clinicians don't take responsibility for collecting data that is accurate; they tick on the wrong places, miss patients and/or forget to tick off. Ninety-nine per cent of the time I get the information from clinician after repeated talking and reminders; staff mentality and habit is a problem." (P11)*
> *"You get a tally sheet which is incomplete, they supposed to put down the folder number and tick off by diagnosis categories, but they don't do it, so at the end of the month you get plain sheets, and you have to draw all the patient folders to see what patients came for." (P6)*

Lack of training and knowledge about the importance of collecting quality information are the main challenges:

> *"I think the reason for the negative alttitude of the staff towards collecting patient health information is they don't realise the importance of the information, and I think most probably lack of training is one part of it; but it is also kind of more emphasis that you give to information." (P4)*

One respondent shared his experiences with the principles to be followed in order to improve the quality of information processing: *"It is very important to use the principles of information collection and processing, such as correctness, completeness and consistency, to ensure the accuracy of the information." (P3)* Training could have helped to identify the problem but, due to workload, lack of resources and time constraints, clinical staffs are not receiving the necessary training to improve the accuracy of information capturing and processing. One participant reported that a simple data collection form was designed for the clinical staff in order to improve the quality of data collection:

> *"Some simple forms were designed to make things easier for the clinical staff to collect the information, to keep daily health information*

*which is added up at the end of the week. But you know they don't use it, just at the end of the month they run around to get the statistics and get counts."* (P2)

The study participants also reported that the frequent changing of the information collection tools contributed to the poor-quality information:

*". . . you see whenever the tools changes, today is this new tool and tomorrow that tool changes, then national is coming down to provincial saying we need to work on this new tool, we need to get training on it and information sessions. Then we must come back and prepare the staff and give them training on the new tools."* (P8)

*"Sometimes when you explain to the clinical staff about the new tools they do understand it, but when it is time to do the job, they don't do it correctly. When you question them, then they say they really don't understand how it should be used."* (P5)

**Discussion**

Health information recording and processing requires regular validation and audit to improve the outcomes of information processing and usability. Information processing is the movement of health-related information from where it has been collected to the endpoint where it is utilised. It is the process of collection, collation, transmission, analysis, dissemination and utilisation of the health information. It is a means for improving the health of an individual – nevertheless, the availability of reliable information does not guarantee its use or improve decision making. Particularly in developing countries, decision making is often driven by politics rather than by evidence. This study reveals that the validation process was mainly conducted by the health facility managers and, at times, by the information officers. The validation of information was focused on the statistical information prepared for reporting to a higher level. There was no validation of clinical information or of information recorded in the register. The validation process was limited to comparing the total figures from previous months and looking at discrepancies. The basic questions formulated by Buchanan and Gibb (2007) in validating and auditing information quality are appropriate in answering the concerns raised by many data collectors and processors. Although electronic health information recording systems are widely used in the developed world across health facilities, at primary healthcare (PHC) level in developing countries paper-based health information recording is predominantly used. Adoption of HIS is seen as one method of mitigating the high healthcare demands and supply (Ludwick & Doucette, 2008). Developing a sound HIS project requires infrastructure such as skilled personnel. It is not enough to install new HIS if you have not trained the implementers. The findings of this study showed that the information officers at PHC level did not have adequate knowledge and skills in collecting and processing health information, such as accurate recording

and conducting simple analysis of the health data for use at facility level. There were concerns about the capability of some information officers in terms of computer skills; although they had a long service history in the health facility, they had no computer literacy skills training in order to transform the paper-based systems to electronic recoding of health data. Ludwick and Doucette (2008) note that factors that need to be addressed for effective implementation of a new system are training the implementers, a sound management system and strong leadership.

The district HIS requires monthly statistical reports on the total number of mental health client visits at health facilities. Health data reporting systems flow vertically on a monthly basis from the health facility to central government. It is rare that feedback on the results of analysis of the information is given to those who collected the health data in the first place. The district HIS data flow policy (National Department of Health, 2011) provides guidelines that information received from the health facility by higher health authorities should be analysed and the results of the analysis sent back to the health facilities in the form of feedback for health service planning and action. The WHO has developed a model for optimal mental health services, known as the pyramid framework, which is used to help organise the place of collection as well as the type of information that needs to be collected (WHO, 2005b). Information analysis systems involve interpreting the information, planning patient care and improving the services through creating a culture of evidence that provides accountability for evidence-based decision making (Hayrinner, Saranto & Nykanen, 2008). It is necessary to distinguish between the different types of information needed, such as: episode-level information, required to manage an individual episode of service contact; case-level information, required to care for an individual service user; facility-level information, required to manage the specific service facility, whether it be a specialist institution, a mental health ward in a general hospital, community mental health team, or primary health care (PHC) clinic; and system-level information, required to develop a policy and plan for the mental health system as a whole (WHO, 2005b). An MHIS is a planning and service delivery tool used for improving effectiveness, efficiency and equity. The use of health data is not only for patient care, but also for administrative purposes and health care planning, as well as for clinical and epidemiological studies (Haux, 2006). Clinical information systems provide opportunities to many healthcare providers, including the ability to analyse and better understand their case practices, costs and effectiveness based on information captured in patient charts (Gray, 2004). Information systems output is measured based on the six-dimensional framework by DeLone and McLeane (cited in Hayrinen, Saranto & Nykanen, 2008) of information quality, system quality, information use, user satisfaction, individual impact and organisational impact. This study identified that the quality of information collection and processing was compromised by the negative attitude of healthcare staff, lack of knowledge and skills, confusion regarding job description and lack of understanding of the importance of information. Healthcare staff feels that collecting health data for reporting is an additional job burden. Implementers have concerns about

recording health information on the computer due to factors such as privacy, patient safety, providers-patient relationship, time factors, quality care, finance, efficacy and liability (Ludwick & Doucette, 2008). Understanding factors affecting implementation outcomes of HIS are essential (Ludwick & Doucette, 2008).

## Recommendations

It is more than 15 years since a district HIS has been implemented in South Africa; however, the pace of development of the district HIS has been very limited due to several impeding factors that have not been adequately addressed. It is recommended that to improve the MHIS at PHC level, integrated computer-based mental health information system should be developed to support mental health information documentation. Electronic mental health records enhance primarily the setting of objectives, planning of patient care and documenting of delivery of care. Developing technologically oriented mental health leadership at the different hierarchial structures would help to transform the paper-based recording system into a digital recording system. This would also improve the quality of information recording and processing, which could be enhanced by developing a strong information validation system. To develop positive attitudes of staff in health information systems, it is crucial to provide in-service training on information collection and feedback for users at health facility level, as indicated in the health information systems policy guidelines. It is also recommended that the relevant higher training institutions consider incorporating a health informatics course into their curriculum.

## Conclusion

The study has demonstrated that South Africa has district HIS that requires health facilities to report certain amount of health data, including mental health data, to different hierarchical levels every month. However, several factors impede the implementation of MHIS at PHC services. These include lack of infrastructure, such as technologically skilled personnel, computers and information system software; negative attitudes towards information collection and processing due to lack of training; and inadequate skills on how to collect and process information. The study reported poor feedback systems for the information sent to higher level, and confusion on job clarity among clinical staff and information officers whose responsibility is to gather and collate patient information. There is also suboptimal understanding about the importance and use of health information for patient care or case management, service planning, and epidemiological and behavioural studies.

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