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Information behaviour of primary health care providers in rural Uganda

An interaction-value model

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Abstract

Purpose – The purpose of this paper is to investigate the accessibility and use of health information among primary health care providers. The study focused on women and health workers' experiences with information in rural Uganda.

Design/methodology/approach – Face-to-face interviews (82) were conducted using an interview schedule that consisted of open questions and one relating to health information critical incidents. A holistic inductive paradigm was used with a grounded theory analysis. An "Interaction-value model" emerged from the study. The model was driven by the value and impact of information, unlike previous information models which have been driven by information needs.

Findings – The findings have a number of implications for improving information provision, and further research.

Originality/value – This study has demonstrated that, although an information need could trigger off an information activity, the subsequent information processes could only be sustained by the value of information. The study has also shown that health workers were generally active information seekers, whereas women were mainly passive.

Keywords Information modelling, Primary care, Women, Rural areas, Uganda

Paper type Case study

Introduction

The development of effective information services for rural people, and the policies governing their implementation and use, depends on ample knowledge of rural people's information environment and behaviour. Hardly any empirical data exists on this topic in Uganda. Focusing research on rural health workers, who are professionally isolated, is an important step in improving their information infrastructure. This would indirectly enhance information provision to the communities they serve. At a local level, the study is important because the majority of Ugandans do not see high level health workers when they seek health care; it is provided within the family, community or health units run by nurses and clinical officers. The main aim of the study was therefore to investigate the accessibility and use of health information among women and health workers, who are at the lowest level of Primary Health Care (PHC) service delivery in rural Uganda.

Unlike studies in the developed world which tend to focus on information systems and retrieval (Vakkari, 1999; Spink, 1999), the interest of an information researcher in a

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rural African setting is inevitably on information in every day life. In a post civil war situation of an African rural area, can the use of available information make a difference to the lives of rural people? How do rural people react to information provided by health workers, and what sort of information do the health workers need? Having compiled several bibliographies, the researcher had identified a gap in existing studies on health and rural Uganda.

In this study, the term information is used in a broad sense to include the subjective and objective aspects of information following Dervin (1977) who conceptualised it in three ways: objective information that describe external reality; subjective information that describe internal reality; and information as the behaviours enacted by the individual in the process of understanding reality.

Research context

A large body of literature on user studies and information behaviour exists since the late 1940s, and it has extended into several thousand reports and journal articles over the years (Wilson, 1997). Although these studies have grown tremendously in quantity, and have also improved in quality within the last two decades, the available literature highlights significant gaps in the understanding of information access and use in a rural African setting. Furthermore, no similar study has been traced in the available literature on Uganda.

Many unpublished KAP (knowledge, attitude and practice) studies on AIDS, STDs and family planning, as well as mass media campaign evaluation studies on the same topics were identified in Uganda[1]. Although most of these studies were carried out by health professionals, they all recommended improvement in the provision of information as a way of reducing the health problems studied.

Elsewhere in Sub-Saharan Africa, some in-house studies conducted by librarians are reported in the proceedings of several conferences[2]. These in-house studies are important as they highlight the need for improvement of library services to the health professionals. However, they provided no conceptual or methodological issues which could inform this study. More formal studies such as those by Apalayine and Ehikhamenor (1996) and Jalloh (1998) were also reviewed. They all used quantitative methods, but some in combination with qualitative approaches. The studies focussed on information needs, sources of information, and were mainly descriptive.

Mutua (1997) suggested that resources which are appropriate to the changing environment and are increasingly IT dominated, but urban based, need to be investigated. Their impact on rural communities needs to be assessed and taken into account within the overall information framework. This recommendation was taken into consideration. Among other things, ICTs and information share in common "the information user" who was the focus of this research.

Wilson (1999, p. 839) pointed out that information behaviour models are scanty, although those on information seeking behaviour are many:

> There appear to be few models of information behaviour in general – only that of Wilson (1997) was located – whereas there are a number that relate to information seeking behaviour: Dervin's sense making theory (Dervin, 1983); Ellis's behavioural model of information search strategies (Ellis, 1993); Kuhlthau's model of the stages of information seeking behaviour; and Wilson's model (Wilson, 1997).

He had earlier pointed out that there had been lack of or limited focus on information use:

> ... the (1997) model needs extension to include information processing and information use, which are the stages beyond information – seeking and which provide the link back to the needs ... (Wilson, 1997, p. 569).

Hence, the need for a study like this one which attempted to conceptualise and explain the issues concerning information access and use in a rural African setting. This can best be done by employing qualitative research methods to understand people's experiences, perceptions and perspectives; to answer not only the "what" but also the "how" and "why" questions; and to go beyond our usual a priori conception of information behaviour and processes.

In information science, no relevant women information model was identified from the literature reviewed. The closest study was by Ngcobo (1994, pp. 162, 165) who pointed out that:

> This was a descriptive study on the health information seeking behaviour of women in rural Swaziland ... The findings of the study showed that rural women encounter health problems which in turn result in their search for information. The findings on information needs have revealed an index of the health information needs of the rural women which can be summarised as questions that refer to: what? when? where? who? why? and how? of the health problem. This model can be used as a guide for predicting the health information needs of the women.

That model was too simplistic to represent a whole phenomenon of health information access and use in a complex rural African setting.

There have been some studies on women's access to information in rural Africa (Nginwa *et al.*, 1997; Uhegbu, 2000), but these studies confirmed the need for conceptual and/or methodological improvements in research. Mutua (1997, p. 74) for example, recommended that:

> Further investigation is required as to how women's groups might provide the information structure for the community as a whole ... Information professionals need to research the use of the various forms of communication, look at existing social structures and their use as a means of conveying information, and get away from conventional means. They need to adopt an approach which is an integral part of the way of life, not alien to it.

The methodological disparities and limitations were also highlighted by Bosompra (1989, p. 1139) who pointed out that:

> ... this is a methodological weakness which must be recognised ... the adoption of more in-depth approaches to research than what a questionnaire would permit is needed ... since other approaches like in-depth interviews or focus groups could have unearthed more data to enrich our understanding of respondents' health knowledge and practices.

Besides the methods of data collection, it was noted that in the past, many Sub-Saharan African information researchers paid much attention to the demands people make upon formal information sources (Lundu, 1982; Patrikios, 1985; Bosompra, 1989; Addo, 1994; and Nginwa *et al.*, 1997) but not on the role of information in people's everyday lives, work, organisation or social setting, although there were recommendations for such studies:

> . . . there is a need for a nation-wide needs assessment to establish the real health information needs of women in Uganda so that appropriate information materials can be produced and suitable information accessed to the users (Kigongo-Bukenya, 1999, p. 134).

Given the above situation, there was a need for a deeper understanding and conceptualisation of information issues. Hence, the timeliness of this study which took into account issues arising from the literature review, and attempted to address them by:

- broadening the focus to include identified gaps or topics in the study;
- using a qualitative method of data collection; and
- an interpretive approach to data analysis.

Hence, it was imperative to employ a holistic inductive paradigm in the study to be able to advance the understanding of information access and use by women and health workers in rural Uganda.

Methodology

The study took a holistic approach because its focus was on information access, which involves the interdependencies and relationships between information sources, needs and use of information as a whole phenomenon. Information related behaviour was also considered from a holistic perspective, and not solely limited to active seeking behaviour.

Furthermore, an inductive strategy was adopted in preference to logical deductions from set hypotheses. Within interpretive research, the type of qualitative analysis that was considered to be most compatible with a holistic inductive approach was the grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990) as elaborated under analysis.

Sample

Although the study took a holistic inductive perspective with a grounded theory approach, it differed from the grounded theory as originally defined by Glaser and Strauss (1967) in that it did not adopt a theoretical sampling strategy. The sample was determined by the PHC set up, and followed a purposeful sampling strategy as described by Patton (1990). The study therefore focussed on two categories of people who form the base of PHC service delivery, namely the women and health workers. In the PHC set up, it is noted that:

> A person is first offered care by the family . . . Following the care provided by the family, a person can seek subsequent professional care from any level in the PHC service delivery (Kigongo, 1997, p. 67).

In an African family, it is the women who provide the care as pointed out by Bantebya-Kyomuhendo (1997, p. 311):

> . . . illness management is primarily a woman's responsibility. Women are the key decision makers, determining and defining the symptoms, what actions to take, who to consult and where treatment is sought . . . In managing illnesses, women draw their source of power, first of all, from the culturally constructed gender division of labour, that allocates health care, among other things, to the women's domain.

Information-rich cases among rural women in a sub-county were selected from the executive committee members of the Local Councils (LCs), Women Councils, Women groups/clubs and/or faith-based organisations. These are grassroots women leaders. They can also be referred to as information gatekeepers. The strategy used to select this purposeful sample is that of "critical case sampling" which permits logical generalisation and maximum application of information to other cases. Critical case sampling strategy involves selecting (or sometimes avoiding) cases that are, for some reason, particularly important in the community or scheme of things; for example, the sample included women leaders of different groups/organisations in order to tap the different aspects of community life. Forty-eight women leaders were interviewed.

Thirty-four health workers were also purposefully selected for interviews and the different categories were included in the study. They were: eight medical doctors, nine clinical officers, five registered nurses/midwives, seven enrolled nurses/midwives, and five nurse aides/Traditional Birth Attendants (TBAs). Table I shows sample categories of women and health workers.

Data collection

In the initial phase of this study, an interview guide was used by the researcher to pilot the research instruments in one of the study areas. However, because different interviewers were involved, the interviewer flexibility in wording and sequencing questions highlighted the shortcomings of this method. Hence, an interview guide method proved unsuitable to use in the main study which had to employ research assistants. Consequently, a semi-structured design evolved as the best alternative in this situation.

Primary data were, therefore, gathered using a semi-structured interview schedule, with open questions. Two sets were prepared: one for women and the other for health workers. The health workers' interview schedule was slightly longer than that for the women because it included questions about health information provision to women as well as health workers' professional contacts and sources. Both sets of the interview schedule focused on the two major issues this study set out to investigate, namely: accessibility and the use of information. The questions were designed to study the interviewees' experiences, behaviours, knowledge and opinions. Interviewees (in each set) answered the same questions, which enhanced the comparability of responses (and facilitated cross-case analysis), while the open nature of questions allowed further

Women	
Women LC1-5	23
Women councils	10
Women groups	9
Religious groups	6
Total	48
Health workers	
Doctors	8
Clinical off	9
R/Nurses/M	5
En/Nurse/M	7
Nurse As/TBAs	5
Total	34

Table I. Sample categories of women (48) and health workers (34) (total = 82)

probing into the responses, which greatly enriched the data collected. Furthermore, the interview schedule included a question on critical incidents. Interviewees described these incidents in detail, which highlighted a number of issues including how the information satisfied or failed to satisfy a need/ solved or failed to solve a problem.

Although the interview schedule was designed in English, it had to be translated into the local languages spoken by the women and the TBAs. This is because Uganda has no national language; there are as many languages as ethnic/ tribal groups[3]. Another issue was that the word "information" does not exist in vernacular; knowledge, news and/or happenings are used to refer to information. Hence, to put information in the right context and to differentiate it from ordinary news, for example, one had to phrase a sentence to that effect. This influenced the wording or phrasing of some questions in the interview schedule. With the exception of the TBAs, the rest of the health workers were interviewed in English.

While in the field, notes were taken as well as tape recording the interview which was a back-up.

Analysis

The grounded theory approach was used. This is a method that uses a systematic set of procedures to develop an inductively derived theory or model about a phenomenon.

As a semi-structured (open-ended) interview method was used to collect data, it was preferable to do a cross-case analysis for each question in the interview schedule. This involved grouping together and comparing answers from different interviewees to common questions.

The analyst/researcher then identified categories or patterns for which the people interviewed did not have labels or terms. The analyst developed terms to describe these inductively generated categories. "... they can add more meaning to the analysis than in vivo codes[4]. They add scope by going beyond local meanings to broader concerns. They have much analytic ability" (Glaser, 1978, p. 70). In this study, this approach generated the core, main and sub categories. However, lower down, some in vivo concepts were used in addition to the inductively generated ones.

After deciding to do a cross-case analysis for each question in the interview, and to use inductively generated categories, the researcher/analyst proceeded to do open coding, which was described by Strauss and Corbin (1998, pp. 61, 74) as:

> ... the process of breaking down, examining, comparing, conceptualising and categorising (or classifying) data ... Open coding in grounded theory method is the analytic process by which concepts are identified and developed in terms of their properties and dimensions. The basic analytic procedures by which this is accomplished are: the asking of questions about data; and the making of comparisons for similarities and differences between each incident, event, and other instances of phenomena. Similar events and incidents are labelled and grouped to form categories.

Open coding proceeded by dealing with question by question, as already pointed out, noting key remarks, concepts, or categories on sheets of paper[5], cross referenced to interview occurrences (interviewee number(s), interview question(s) and field notes page), which as described by Ellis (1993, p. 477) "represented a kind of item-on-term approach". Cross-case coding of each question in the interview schedule meant that all the data in each question and from each interviewee were thoroughly covered, which led to analytical exhaustivity.

The original Glaser and Strauss (1967) version of the grounded theory was used because of its open approach to analysis. The analysis closely followed the stages highlighted by Turner (1981) and Ellis (1993), which are based on the constant comparative method of analysis, that is central to the grounded theory approach. The method of comparative analysis enables the analyst to generate theory:

> ... that is integrated, consistent, plausible, close to the data – and at the same time is in a form clear enough to be readily, if only partially, operationalised for testing in quantitative research" (Glaser and Strauss, 1967, p. 103).

Open coding was, therefore, followed by selective coding, which is "selecting examples from the abstract features of the model" (Ellis, 1993, p. 478). Indeed interpretation of data must include the perspectives and voices of the people, because interpretations are sought for an understanding of the actions or patterns of actions of the individuals being studied. However, those who use grounded theory procedures accept responsibility for their interpretative roles.

Some interviewee responses are given in the findings. These are based on verbatim records (translated from vernacular to English in the case of women), and are quoted in italics. Each quotation indicates the interviewee number.

During the process of coding which involved identifying, selecting, cutting-and-pasting and categorising, plus the inevitable reading and re-reading of the data and the concepts and categories that emerged from the data, a number of thoughts, ideas and questions about the categories and their dimensions and the phenomenon being studied arose. These included, among other things, relationships as well as variations between and within categories. These ideas and questions were recorded as they came up in a researcher's "notes" file, indicating the category or interview question(s) they refered to, and sometimes the verbatim quotes from the field notes. Several diagrams were also sketched to represent the thoughts and ideas. As time went on during the analysis, these notes or memos and diagrams stimulated further and deeper thinking and creativity that culminated in the development of a model of health information access and use in rural Uganda. The model, that was inductively derived from data analysis, had emergent and root categories which formed five preliminary categories. These are: information needs, information sources, constraints, moderators, and value of information.

The last three categories emerged through grounded theory analysis; while information needs and sources were root categories, which the researcher took into the field. These root categories originated from previous studies as highlighted under the literature review. However, what came out of the root was derived inductively from data. The next section summarises the key findings in each category of the model. Given the size limitations of the paper, however, most of the evidence will be left out, but is available in the thesis (Musoke, 2001).

Discussion of the findings

Constraints

These are obstacles which: prevent a person from accessing information when they occur between an information source and the person; and intervene to prevent information use i.e. they intervene after information acquisition and processing, but before information use, hence stopping the information or knowledge to be put to use

or applied. Two types of constraints therefore emerged from the data: constraints to information access and constraints to information use.

The major constraints identified in the study were socio-economic. The economic constraints affected access to information sources as well as underpinning other factors, e.g. communication, staffing of health units and transport. The social factors equally played a big role in constraining information access and use. The women's findings clearly elaborate how gender, culture and language factors constrained their information access and use. Health workers were more constrained by professional factors such as staffing and isolation, and to a less extent, by social factors like nepotism and security.

Some examples:

> You know seminars are good at updating our knowledge, but sometimes, we get the invitations late when the seminar is over! However, sometimes I fail to attend these seminars even when I get the invitation on time because of the staffing problems here; if one of my staff is on leave and the other is away, e.g. on a course, or sick . . . I can't close the unit; so I miss the seminars (Clinical officer Mh3).

> I have not used a formal library since I came to this health centre . . . I just use the few books we have here . . . Health libraries are very far from here (Nursing officer Bh1).

> My husband finds all sorts of excuses to stop me from attending some of the meetings I am invited to . . . he is only comfortable with those at the village (LC1) level and at church . . . I miss the rest of the meetings or seminars held elsewhere and the useful information provided . . . I know several other women who face similar problems (Woman leader Bw3).

> Recently, we got some pamphlets but they are in English; so, we ask friends to translate for us. . . we need such simplified information but in vernacular . . . Seminars or health talks should also be conducted in vernacular: last month, a talk about FP was organised here, but the presenter couldn't speak Lusoga or Luganda; so we complained because one gains little from such seminars (Woman leader Iw7).

Among the factors commonly reported from Sub-Saharan African studies as hindering access to information was illiteracy. Women in this study, however, reported that availability of appropriate printed materials was more of a problem than illiteracy per se. They pointed out that illiteracy does not totally stop rural illiterate women from accessing information in printed form if that information was repackaged to suit their level (simplified and translated in vernacular) and made accessible to them either directly or indirectly through LCs, women councils/groups and/or school children (moderators). They highlighted several advantages of printed information, e.g. once information is available, it can be kept for reference and that even those who were not around when it was disseminated would get it in full without being distorted or misreported like oral information.

Similarly, despite the constraints reported about access to printed sources, they were still perceived, by the majority of health workers interviewed, as the most important source of information in rural Uganda where ICT infrastructure is not yet fully developed.

Other constraints include: personal factors such as attitude, perceptions and emotion which were reported to have constrained women's access to and use of information. Similarly, the educational level of health workers appeared to have affected their information seeking behaviour such that the more educated a health worker was, the more she/he sought for information.

Women also identified a "lack of health workers in rural areas" as one of the factors hindering their access to information. When asked about this issue, the health educators in the District offices pointed out that due to shortage of manpower, most of the activities carried out were demand driven, such that health workers tend to respond to requests, and/ or go where there is a serious problem.

Constraints to information use. Health workers reported that some of the information they accessed was too technical, irrelevant, inadequate, inapplicable, questionable or repetitive. Women reported that unclear and incomplete information constrained them from using such information.

Furthermore, although some information was reported to have led to changes in the user's state of knowledge, a number of constraints intervened to stop some users from putting the knowledge into practice. For the women, the major constraints in this case were socio-cultural, followed by personal factors namely, attitudes and perceptions, and finally economic issues. For the health workers, such constraints were mainly caused by the changes in medical practice and unavailability of medicines and/or facilities (e.g. laboratories) in rural health units. The poor economic situation in the country gave rise to some of these constraints.

The study also revealed a strong linkage between the constraints mentioned above and information needs. In some cases, constraints triggered off needs, while the reverse was true in other situations as indicated below:

Constraints that led to information needs. Constraints to information use led to information needs, for example, when husbands refused to let women take contraceptives, this triggered off a need for information. Knowing the value of information, some women reported that they needed more information to enable them to solve the problem:

> I wish I could know better . . . I really need to learn more about the advantages of FP so that I can share with my husband and convince him to let me use contraceptives (Woman leader Lw8).

This was also true in the case of health workers. When some young health workers realised that they could not put their knowledge into practice, this constraint triggered off a need for evidence based literature:

> The doses of some medicines as recommended in the textbooks I have differ from what is being practised here. For example, in my textbook, injectable chloroquine is recommended to be given six hourly but when I came to this hospital, three months ago, – I had not practised before – I found that it was given twelve hourly and the patients got better. The same applies to quinine doses. I spent some time arguing with staff on my ward but I lost the argument. So, my books and my knowledge seem not to be functional in these aspects . . . I therefore need some current literature, but I doubt whether the older people on my ward base their doses on current literature! . . . anyway, evidence based literature would solve my problem (Ih8 doctor).

Information needs that led to constraints. In other situations, unmet information needs led to constraints to information use. The women's data highlight various interdependencies and relationships between unmet information needs, sources of information and constraints to information use, e.g. regarding the immunisation programme. Although all the women interviewed in this study reported that they accessed information about immunisation, the information they had accessed left some unanswered questions. For example, women needed information about the safety of the

vaccine; when this information need remained unsatisfied, women decided not to have their children immunised, hence they were constrained to use the information they accessed about immunisation dates, venue and age of children to be immunised.

There were a number of things to note:

- The dynamic nature of information needs which changed from passive to active. In this case, women accessed information about polio immunisation passively; afterwards, they wanted to know about the safety of the vaccine, which became an active need.
- At the time of the interview, the unmet information needs had led to constraints to information use, but a lack of "information about the safety of the immunisation programme" was both an unmet need and a constraint to information use as illustrated below (see Figure 1 A and B).

The unmet information needs, therefore, remained a strong constraint to information use, as well as a challenge to the health of Ugandans.

Moderators

These are factors, structures, organisations and/or individuals that enhance or support information access; they regulate, reduce or intercept the constraints to information access and information use. They therefore act as a buffer.

Informal or social networks and the value of information were the major moderating factors identified. Through interpersonal interactions and the repackaging of information by the Ministry of Health, Professional associations and other information providers, various constraints to information access and use were moderated, thereby enabling women and health workers to access and use information. Putting together issues about moderators inevitably brings in sources of information because there was moderation of constraints concerning sources, and it brings in the constraints as well.

The analysis revealed a relationship between the constraints to information access and the moderation by individuals, organisations and structures that reduced or intercepted the constraints and led to improved information access. For example, the problems of limited access to information caused by having few or hardly any health workers reaching some rural areas, lack of time for the women to attend meetings, listen to the radio, lack of access to the radio, etc., led the local council (LC) executive committee members to take on an information dissemination role (for the benefit of their communities) either by inviting health workers to give talks in LC meetings or by the LC executive members moving door to door to ensure that information reaches every member of their community. At a slightly higher level of abstraction, this

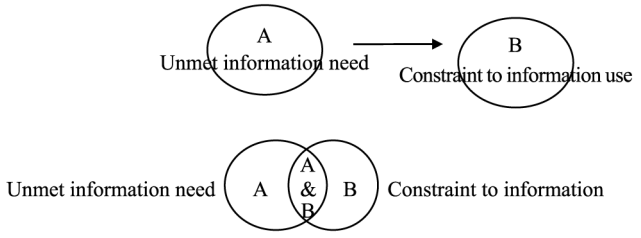

Figure 1.
The effect of unmet information needs on information use

relationship seemed to be one in which the value of information, the need for information access and use, and the prevailing constraints in rural Uganda had led, among other things, to the institution and flourishing of an informal mechanism of health information provision.

Nuijten (1992) observed that such local practices or initiatives are often denied their due importance and labelled as "disorganised", "traditional" or "indigenous" in development studies literature. These debates, however, remain far removed from the everyday practice of the people as this study has demonstrated.

Moderators, like constraints, were divided into two:

(1) moderators of constraints to information access; and

(2) moderators of constraints to information use.

Leaders (local, women and religious) were key moderators of constraints to information access. In addition to providing information directly, women reported that religious institutions and leaders moderated information access in various ways; for example, they organised seminars, drama or films, and collaborated with LCs and government. This was very important because women pointed out that their husbands did not object to their attending church related activities. Hence, besides moderating constraints concerning sources, e.g. access to health talks, the church also moderated the gender constraints to information access. Furthermore, when the church leaders organised free film and drama shows, they moderated the economic constraint to information access. Some women reported that people failed to attend such shows because of entrance fees.

The church also moderated information access by playing a role in shaping people's beliefs, attitudes and values. This was commended in so far as it influenced people's "positive" behavioural change and promoted health. However, it became controversial when AIDS prevention and family planning issues were discussed. Some health workers reported that the practice of encouraging people to use contraceptives contradicts the church's stand, which constrained information use and consequently, acceptance of these practices. This issue, however, was raised only by health workers. Women reported religious leaders, beliefs and practices as moderators of constraints to information access.

Women's experiences, negative and positive, coupled with the value of information did moderate a number of constraints through interactions in the social networks. Indeed women's negative life experiences played a big role in their information activities, but specifically in the moderation of constraints. The disabled reported that they mobilised and convinced people to take children for polio immunisation, giving themselves as examples that no parent would wish to see her child go through. Those who had many and poorly spaced children because they did not get to know about FP used that experience to sensitise their family members and other people, and managed to convince them to use FP methods.

Similarly, the positive experience of those who got to know about issues such as FP and successfully took them up was used to convince others who had misconceptions. Women reported that they act as role models when sensitising others and showing them the benefits of contraceptives. Some women confirmed that they were able to overcome various misconceptions after friends and/or relatives shared their positive

experiences and advised them on what to do. Hence, women's experiences greatly moderated misconceptions.

In the case of health workers, interpersonal interactions, professional activities and local initiatives emerged as the key moderators to information access and use.

Moderators of constraints to information use. The major moderator of constraints to information use was the value of information itself. This made people moderate information access and in the process, they moderated information use. For example, when information providers translated and simplified the information they provided, e.g. during health education talks, seminars, pamphlets, drama and what is preached in church, they, in effect, repackaged information and put it in a form that was not only accessible, but also usable by the women. The quote from Bw6 below about the LCs is another good example. Furthermore, it was reported that the Ministry of Health provided information which had been simplified and translated in vernacular so that women could understand it and be able to use it for composing songs or plays to disseminate the information further. Hence, besides its value, the quality of information and the supportive infrastructure moderated information use. For example, the quality of information received assisted in overcoming misconceptions or negative views, which led to information use. Clear and complete information which was easy to understand, and the full explanation by the providers of information led to changes in the user's knowledge, behaviour, values or beliefs. For example:

> I heard about polio immunisation on radio, but since the other year's (1997) bad experience of children who died after the immunisation exercise, I had not made up my mind . . . I still had questions about the safety of the vaccine (unmet information needs). However, when the LCs came here, they explained to me fully and allayed my fears that the deaths were due to malaria, but not the vaccine; I then decided to take my kids for immunisation (Bw6) [the researcher found her taking her children].

The provision of information alone, without the necessary infrastructure hardly changes the situation. Women accessed the information but would not be able to put it into practice if they did not have the necessary resources, support from the family or the infrastructure. Health workers vividly demonstrated this issue:

> The presence of safe water in the area where we conduct health education sessions about, e.g. water borne diseases has greatly facilitated these sessions . . . It is easy for the women to implement because each parish now has 2-3 bore holes or protected springs, and we see the effect already because diarrhoeal diseases have greatly reduced. In the past, before the Rural water project improved access to safe water in rural areas, we used to carry out health education sessions, but diarrhoeal diseases were rampant! (A clinical officer).

Hence, the presence of safe water enabled women to use the information they had received from health education, which reduced water borne diseases. Women's interest in implementing what they learned emerged as "personal moderators" to information access. The presence of the necessary infrastructure coupled with this interest moderates information use.

Information sources and needs

A brief explanation of the different types of sources and needs referred to in the study is given below.

Sources. This is where the information was obtained from (actual) or could be obtained from (potential). Information sources exist even when there is no apparent (active) need for information. For the women, most information was accessed passively, while some information was obtained through active seeking. The reverse is true of the health workers. Hence, women and health workers interacted with sources passively or actively for latent or apparent needs.

Information needs. The apparent need for information makes people go to the source to seek information actively, whereas for latent needs, people get information passively, and may then realise that they needed it. Hence, from sources, information "goes" to latent and apparent needs; the unmet needs may lead to active information seeking from sources.

Furthermore, unmet information needs may become constraints to information use and vice versa, as discussed under constraints. Therefore, there were three major types of information needs in this study: those which resulted mainly from critical incidents and triggered off active information seeking are referred to as "critical information needs". Then there were those which the interviewees (particularly women) reported as unmet information needs but had not led to active information seeking, these were regarded as "latent information needs". Thirdly, the findings showed that all the health workers and about 27 per cent of the women interviewed habitually sought for health information actively. For the health workers, it was mainly for their professional activities, while for the women, it was for general health knowledge, updating, etc.; and some women with chronic illnesses, e.g. sickle cell disease or those living with HIV/AIDS actively sought information to cope with stress or a health problem. These needs were simply referred to as "active information needs".

As already noted, discussing constraints and moderators highlighted some overlap with information sources and needs. A more elaborate and specific discussion of information sources and needs has been left out of this paper because of space limitations.

Value of information and actions

This was the value attributed to information and the subsequent actions reported by the interviewees. Although this was a user centred study, it did not set out to measure the value of information; the value, as presented in the findings, emerged inductively from the qualitative data. It was noted that the interviewees, as users of information, judged the information they accessed and attributed, or did not attribute, value to it. The meaning information made to people after being accessed, used and interpreted, and its significance and role as perceived, experienced and reported by the interviewees were conceptualised as the value people attributed to information.

Interviewees reported that when they accessed information and used it, some of that information changed their states of knowledge, values, beliefs and behaviour. This led to the various actions that put the knowledge acquired into practice or applied the information gained in various ways. For example, when women received information, used it and found it valuable, they carried out various information dissemination sessions both formal and informal; so, they interacted with their networks. The value and impact of information also made health workers disseminate information to others in various ways (print, oral, visual). These information dissemination activities were driven by the value of information, and involved interaction with individuals, groups

and communities in the case of women leaders interviewed; or fellow health workers and patients in the case of health workers. Therefore, those individuals who had been constrained to access information in one way, accessed it in another way (and a series of processes of information access and use went on, as value-reported information led to further interactions). Hence, the "interaction-value" model that emerged from the findings. This shows that while an information need could start off an information process, it was driven and sustained by the value of information.

The value of information, as reported in the findings, was quite subjective, although it was shared with others as indicated above. Hence, this study's approach to the value of information is what Saracevic and Kantor (1997, p. 532) referred to as "perceived value approach" which is:

> Subjective valuation by users of information, of the value or benefits of given information. This assumes that users can recognise the value of information (or the benefits gained/lost). If scales are used, it assumes that they can place the value in some ranking.

Health workers reported the value of information mainly from a professional rather than a personal point of view. Some examples of the value and impact of information in critical incidents are given below:

> A 12 year old child was brought to the health centre bleeding from the nose profusely. After positioning him properly, I needed to find information about the reaction of one of the medicines I wanted to prescribe because I remembered from my training that this particular medicine, if not administered properly, could cause serious clotting which may result into death. So, I rushed and referred to a manual (Standard treatment guide) which fortunately provided the information about the correct dose of the medicine; I then gave it to the child and he got well (Clinical officer Bh8).

> Recently I examined a patient and thought he had an intestinal obstruction; on opening, I found a ruptured gall bladder yet I had never done cholecystectomy before. I called in a colleague; before he came, I decided to read the CME materials which provided the details of what to do. When my colleague came, he brought a copy of Primary Surgery textbook by King which also gives step by step account of what to do in order to carry out that operation. These assisted us to successfully do the operation (doctor Lh1).

A few examples were cited when health workers reported that the information they had accessed enabled them to make decisions concerning personal health, e.g. condom use and diet. The data from women, on the other hand, showed that the value of health information was mainly to the family, then personal, and community in that order. What made the findings so distinctly African, was the extended family aspect. Women reported the value of information in relation to its effect or benefit to the nuclear and extended family members.

Therefore, the value of information in this study was mainly at two levels, namely, the social level because it served communities, and an individual level. The two levels were, however, interdependent. Health workers shared their individual valuable experiences with patients on such issues as diet or other professional matters with colleagues. Women leaders did the same.

The findings also showed that the information women accessed did empower them to make decisions about what to do or avoid, where to go, which treatment to take, etc. Making decisions therefore included behavioural change, treatment choices and other decisions. Some women reported that among the various decisions they took was to

change behaviour in order to prevent diseases such as AIDS. This can be illustrated as follows (see Figure 2).

The study found out that awareness about AIDS was quite high, in fact the highest of all the health topics reported. That high awareness seem to have been translated into behavioural change, which has greatly checked the spread of AIDS in Uganda. This development has been supported by national and international statistics, which indicate that the HIV/AIDS rate has reduced from 18 per cent to 5 per cent in less than ten years due to effective information provision and behavioural interventions[6].

The value of information in the prevention of diseases and promotion of health was clearly demonstrated in the findings. The various actions that resulted from the value of information were reported to have promoted health in many ways. This agrees with some health reports:

> Both the public health and the personal care interventions have contributed to reversing the urban – rural differences in health status; better health among urban populations is due more to the application of improved knowledge than higher incomes in cities (WHO, 2000, p. 10).

It therefore follows that although rural areas had low incomes, they could enjoy better health if they accessed information to enhance their knowledge. Hence, factors which negate information access and use in rural areas need to be addressed in order that rural communities may reap the benefits of improved health knowledge.

Literature on the value of information to clinical decision-making (Florence, 1992; Urquhart and Davies, 1997; Musoke, 2000) has been boosted by recent studies on evidence based medicine (Booth and Brice, 2004), and the recent compilation of "examples of impact" by INASP (2003). Earlier on, a few authors had focussed on measurement of information (Tague-Sutcliffe, 1995), and information impact (Menou, 1998). The findings of this study, which have elaborated upon the value of information in lay women's lives and health workers' professional and personal lives in rural Africa are therefore novel.

The interaction-value model

The major output of this study was the model that emerged inductively from data. The previous section presented summarised evidence on which the model is based. Although initially there were five categories (information sources, needs, constraints, moderators and value of information), further thoughts and abstraction led to an "Interaction-value" model with one core and two main categories. This conformed to the recommendations made by Glaser (1978) and Strauss and Corbin (1990) that a model should have one core category.

What was therefore abstracted from the analysis as the main theme was that "Access and use of information was a series of processes that depended on the value and impact of information to overcome or reduce constraints". Hence, "value of

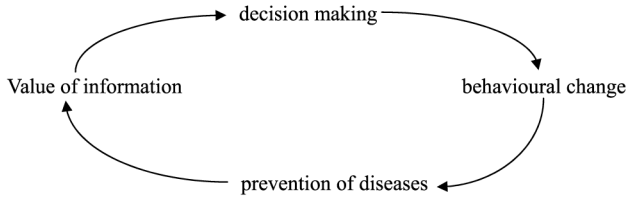

Figure 2.

information" is the core category, while the other two main categories are: "moderation of constraints" and "interaction with sources for latent or apparent needs". It was noted that previous models of information behaviour tend to give prominence to information needs (Wilson, 1999), in this study, however, the "value of information" emerged as a driving force in the various information actions reported.

In the model, generally the constraints had to be moderated first. Most moderation involved interaction. After moderation of constraints to information access, people then accessed information by interacting with sources either passively or actively for latent or apparent needs. Information was then used after moderation of constraints to information use. This led to the attribution of value and the various actions, which in turn moderated constraints to information access and use, and the information process continued. A detailed discussion of the overall model, which attempted to incorporate the above processes is presented in Musoke (2001).

Implications of the study

This section highlights the contribution of the study findings to knowledge about the information behaviour of women and health workers in rural Africa, and its implications for existing theory and/or information behaviour models.

The study findings have demonstrated that people can access a significant amount of information without active seeking. This was particularly true for the women. The study further showed information access as a phenomenon resulting from the interaction between individuals and information sources in the context of life-related situations (in the case of women) and, mainly but not exclusively, work-related situations (in the case of health workers) that provoke information needs, information use and information behaviour, with the value of information at the centre of these activities. The findings show a process of human information behaviour, involving cognitive, affective and contextual factors, among others.

Since users interact with sources (of various types: human/oral, visual, printed, electronic, etc) and make meaning or sense out of the interaction, what Talja *et al.* (1999) referred to as "in-between approaches" could be termed "interactionist approaches". In this study, the interaction emerged from the analysis and interpretation of users' experiences as reported in the interview situation. Furthermore, although the study did not have causal approaches, the interaction that emerged from the data is clearly part of information behaviour.

The "interactivity" in the findings of this study was added to the Slawson and Shaugnessy formula by Smith (2002). The formula is:

$$U = \frac{R \times V}{W}$$

Where U = usefulness of the information to health workers, R = relevance of the information, V = validity of the information, and W = work to access the information. In words, the most useful information for health workers is information that is relevant to their practice, valid, and does not take too much work to access:

> After listening to a presentation ... on the usefulness of information to rural health workers in Uganda, I added "interactivity" to the top line of the equation. The information is still more useful if you can interact with the source and interrogate it. The formula provides a test of the ways in which doctors look for information they need. (Smith, 2002).

The meaning which the interviewees made of the information they received through interactions with others give the findings of this study a symbolic interactionist focus. Blumer (1969, p. 2) highlighted three major premises fundamental to symbolic interactionism. These are: human beings act toward things[7] on the basis of the meanings that the things have for them; the meaning of such things is derived from, or arises out of, the social interaction that one has with one's fellows; these meanings are handled in, and modified through, an interpretative process used by the person in dealing with the things she/he encounters. Symbolic interactionism sees meaning as arising in the process of interaction between people. Symbolic interactionism has been criticised for concentrating on small scale rather than large scale structures and processes, for example, while symbolic interactionism concentrates on face-to-face contexts of social life (micro-social features), structuralism focuses mainly on cultural features of social activity (macro-social features).

Although the study findings tend to support symbolic interactionist perspectives, it does not mean that the cultural aspects which underpin women as care providers in the family, and the culture embodied in social practice and activities such as burials or weddings (which were sources of information) are being ignored. What emerged from the findings commonly highlighted a face-to-face interaction either as a preferred source of information (e.g. friends or colleagues) or as moderators. Interpersonal interactions emerged as important moderators of constraints to information access for both women and health workers. Furthermore whatever information was accessed, there was interaction with sources.

The general findings of the study, however, differ slightly from symbolic interactionism. First, the use of printed and audio sources did not involve direct interaction between people, although it fitted in the first premise of "acting towards things". Secondly, when one considers sociological issues like human action and social structure, one finds that symbolic interactionism emphasises the creative and active components of human behaviour as controlling the conditions of human lives, but pays less attention to the constraining nature of social influences on the actions or activities of human beings. This study vividly highlighted that factors such as gender or religious practices and values interfered in both women's and health workers' activities especially on topics like contraceptives and AIDS control. Hence, even though women interacted with health workers, accessed information about contraceptives, and derived meaning out of the information they accessed in the interactions, some of them reported that they were not able to use that information due to the social forces around them. On the other hand, social factors were reported to have moderated information access for the interviewees in several ways.

The interpretation of information and the interactions were also highlighted (e.g. under Actions in the Value of information category). Women accessed information, used it and disseminated it to others formally, e.g. in meetings, and informally to relatives, friends and the community (interaction with networks). This agrees with "The two- step flow" of communication model in a number of ways, for example, women interviewed in this study were opinion leaders who reported that radio was the best channel through which health information was accessed in their rural settings. Secondly, these women leaders generally disseminated information to people of similar socio-economic status, but the people they disseminated information to had great respect for them and regarded them as knowledgeable. During the interviews, for

example, women quoted the LC secretary for women as a source of various types of information. Hence, information moved from source to the women who interpreted it and then passed it to other people who were reported to have been influenced in many ways, e.g. overcame misconceptions about family planning, convinced them to take children for immunisation and other attitudinal changes. Such interactions, social relationships and personal influence have been reported in mass media literature (particularly under the Two- or multi-step flow models) as playing a major role in spreading innovations and bringing about technical and cultural change. (Defleur and Dennis, 1989; McQuail, 1994).

In addition to the above, the study findings showed that information access (and use) may involve only one step. This was when both women and health workers reported having accessed information directly from, say, the media and it had an impact on them. However, there were many situations in which the information process involved several stages. For example, religious leaders accessed information, announced it in church, those who were in church passed the information on to friends and relatives or to LC/women group meetings, who also passed it on to others. Similarly, health workers reported that they got information from various sources, then passed it on to other health workers or women in seminars/documents they produced, and these in turn passed it on to others. Such findings have been reported to have led to the evolution of the two-step flow into a multi-step flow model.

Studies carried out elsewhere in rural Africa had similar findings; for example, Bosompra (1989, p. 1138) reported that:

> Our findings underscored the relevance of the two-step and multi-step flow models of the communication process to health information dissemination in Ghana. Respondents relied almost equally on conversation with family and friends on the one hand and radio on the other, for information on the selected health topics. Health workers and a traditional communication channel … also played significant roles.

The above findings inevitably lead the discussion to "social networks" which emerged as important access and use factors in this study. Despite their contribution to information access and use, however, social networks have not received due attention by information studies researchers. In this study, social networks enhanced the information process by moderating constraints to information access and use as indicated under moderators. The study findings, therefore, matched well with those of Belderson (1999) who pointed out that the informal network was a widely accessible and utilisable source, well suited to the delivery of information without a high degree of active seeking, and in a natural and unpatronising environment. The findings are also consistent with the social network analysis (Haythornthwaite, 1996) which pointed out that informal information exchange routes develop based on local needs and information is made useful by being forwarded to others.

As pointed out earlier, the study found that in the case of women, passive access was the principle behavioural mode of health information acquisition. Conversation with relatives, friends and village-mates provided a great deal of information. Women also listened to the radio, preachers in the church or the mosque, watched drama, films and television. Active health information seeking was mainly reported in critical incidents or situations either personal or family, and as women leaders when they were required to attend seminars or to collect and disseminate information to their

communities. The women's findings, therefore, differ from some earlier works where active information seeking was the principle mode (Ellis, 1993; Wilson, 1999).

The findings, however, agree with those of Belderson (1999, p. 233). She noted that participants in her study:

> ... tended to be confronted with information rather than actively seeking it. Acquisition of nutrition information ranged from purely accidental (e.g. while watching a television programme) to semi-purposeful (e.g. consulting a doctor about a health problem and receiving nutrition information as a consequence).

Passive access to information does not seem to have attracted much attention of information researchers. This is probably because it is considered inappropriate as it tends not to have direct relevance to information systems design, which most information studies target. Passive access, however, emerged inductively from this study, and it could not be ignored. What is also important, in the findings, is the dynamic nature of women's information behaviour: the fact that information accessed passively sparked off various active behaviour either by disseminating the information to others, or by actively seeking more information to confirm or clarify what had initially been received is something worth documenting. Hence, although women mostly accessed information passively, their subsequent information behaviour was active.

On the other hand, health workers actively sought for most of their information. Health workers' information needs and their information seeking behaviour in this study generally agree with Wilson's (1997) model of information behaviour. The findings also support Dervin's Sense-Making theory to some extent. The theory states that people seek information when they have identified gaps in their knowledge that prevent them from making sense of a situation in which they find themselves, solve a problem at hand or make an informed decision (Dervin, 1992). This theory can therefore explain generally when and why most health workers seek information. However, the two models (Wilson's and Dervin's) may not explain, to the same extent, the information behaviour and information needs of rural women in Uganda.

Many women reported that they had "gaps in their knowledge" about certain diseases or health problems. Dervin's theory would suggest that they seek information about these issues to make sense of the situation. However, women went on to report that they did not seek information in the majority of the situations; hence, making these needs "latent" rather than "active". The gaps in women's knowledge remained until they were exposed to information passively as already reported. Wilson (1997, p. 555) acknowledged the fact that people do not always seek information when they have knowledge gaps:

> The fact that purely cognitive drives cannot explain information-seeking behaviour is attested to by the fact that, even in critical circumstances when the gaps in their knowledge are evident, people do not always seek medical information.

Women's information behaviour in this study was also different from the blunters in the "monitoring and blunting" theory (Baker, 1995) because the blunters do not want the information. In fact when asked whether they would prefer getting information or not if they were faced with a life threatening problem, all women interviewees, except two, answered "yes".

To a certain extent, the social network and multi-step flow model, discussed above, may explain women's information behaviour better than other previous models. However, the study showed that women's access to and use of information as well as their information behaviour could hardly be explained by isolated or single factors; it was a complex and intricate process that involved a number of factors and actors and depended, to a large extent, on the situation within the family, community and district in general, as well as personal attributes. It is, therefore, a multivariate based and quite dynamic situation.

Thus, both passive and active behaviour were prominent in the "Interaction-value" model. The information behaviour in this study can therefore be summed up as: access with or without seeking.

The "Interaction-value" model differs from Wilson's (1997) and Dervin's (1992) models in that the value of information, more than anything else, was the "driver" in the various information activities reported in the study.

Conclusion

The author concludes this work with a quote from one of the women interviewed:

> . . . in my view, I feel that improving the provision of health information to women would be the beginning of a better life for a rural community because women provide care for everybody in the family (Lw2).

The quote sums up the study quite well: first, it has confirmed that the main concern of the study was not to quantify data, but rather to understand issues surrounding access and use of information in rural Uganda, and how women and health workers perceived and interpreted these issues. Secondly, it has demonstrated that in an African family, women nurse and care for the sick, hence targeting women in information provision could have a multiplier effect. Thirdly, the quote has highlighted the value attributed to information in the betterment of rural health. This value has been demonstrated in the study to have driven and sustained the various information processes. Finally, it shows that there is a need to improve information provision.

The study has also shown that not all information users are active seekers. The main difference between the two groups of interviewees was that health workers were generally active information seekers, whereas the women were mainly passive. Passivity, however, was generally limited to the act of accessing information. After passive information access, the subsequent user behaviour was active. Women's information behaviour was therefore dynamic. The difference in the findings appears to stem from the fact that for women, the process of information access and use was dependant on the relationship and interaction between their social and information environment in everyday life; while for the health workers, professional matters added a further dimension to their information activities.

The study has therefore succeeded in giving an in-depth view of access to and use of information by women and health workers in rural Uganda. We have progressed from knowing about the sources of information to what that information actually does once it is accessed, and how valuable it is to the activities of health workers and the lives of women and those in their care. The value of information elaborated upon in the study and the actions that proceed it, have shown that a successful information process leads to an active contribution to health care. While it is not strictly possible to generalise the

findings from this purposive sample to all rural areas, it is likely that the issues identified in this study will apply to other lower levels of PHC in rural Uganda, and other Sub-Saharan African countries. This finding could be tested quantitatively in future.

Furthermore, the findings appear to acknowledge the importance of a symbolic interactionist perspective in so far as it focuses on the importance of the meanings that emerged as people defined their information situations through interpersonal interactions. Such interactions were highlighted in all of the categories. However, symbolic interactionism stresses the creative and active aspects of human behaviour, and tends to pay less attention to the social factors which may be beyond the control of human beings, but all the same constrain their actions. This study concludes that both these issues were important to information access and use in rural Uganda. The various face-to-face interactions moderated information access and use when they took place, but there were situations which had not been moderated by these interactions, and the social factors overwhelmed the information process. Finally, the potential use of this social psychological theoretical approach to information behaviour is something that needs further attention by information researchers.

Notes

1. Makerere University has a rich collection of theses/dissertations (www.aau.org/datad/database), and there were several such reports in NGOs and ministries' resource centres or databases. Bibliographies like Musoke (1993) indexed several such studies.
2. Conferences for example: The Association for Health Information and Libraries in Africa (AHILA) (www.ahila.org) holds biennial conferences; the International Congress on Medical Librarianship (ICML) is held every five years. For example, Patrikios, H. (1995) reported her in house survey on the use of Medline abstracts by the University of Zimbabwe Faculty of medicine staff and students, in Health Information for the Global Village, Proceedings of the 7th ICML, May, Washington, MLA.
3. According to Barton and Wamai (1994), Uganda has more than 40 clearly distinct ethnic groupings.
4. These are concepts or categories developed and articulated by the people studied … those that have been abstracted from the language of the research situation (Glaser and Strauss, 1967, p. 107).
5. Cards were used initially, but they proved too small, hence sheets of paper were preferred.
6. In November 2003, the African-American Institute gave an Award to Uganda in recognition of its fight against HIV/AIDS … The Institute hailed Uganda's dramatic reduction in HIV/AIDS rate in the last ten years owing to vigorous public education campaigns … www.monitor.co.ug/news November 7, 2003.
7. According to Blumer (1969), such things include everything that the human being may note in his/her world, e.g. physical objects like books; other human beings like friends or relatives; institutions like health units, church or government; guiding ideals like individual independence or honesty; activities of others like their requests; and such situations as an individual encounters in her/his daily life.

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About the author

Maria G.N. Musoke graduated from Makerere University in 1978 with a Bachelor of Science Honours degree and diploma in Education, majoring in Botany, Zoology and Education. She then did a postgraduate diploma in Librarianship at Makerere University, East African School of Library and Information Science (EASLIS) and graduated in 1980. In 1984/1985, she did an Mlib degree at the University of Wales, Aberystwyth, specialising in health information. From October 1997-February 2001, she did a PhD at the University of Sheffield, UK. A report from her examiners about her thesis noted, among other things, that The results are important in that this was the first in-depth qualitative study of this topic in Eastern Africa. The research has produced new knowledge .... As far as professionals know, Dr Musoke was the first Ugandan woman to get a PhD in Information Science. Dr Musoke is the head of the Medical School library. She also teaches at EASLIS and supervises postgraduate students. She compiled the first annotated bibliography of research on women in Uganda (1993), and has several important publications. On the International scene, she was the First Vice President of the African regional Association of Health Information workers for two terms (1990-1996), and she is currently the country focal point for the African Index Medicus, Health InterNetwork Access for Research Initiative (HINARI), National co-ordinator of Communication for Better Health and Problem Solving for Better Health, etc. She has won several international research awards and honours. She can be contacted at: mmusoke@med.mak.ac.ug or mariagnsmusoke@yahoo.com