ACCESS AND USE OF INFORMATION BY PRIMARY HEALTH CARE PROVIDERS IN RURAL UGANDA: AN INTERACTION-VALUE MODEL

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Abstract

This paper presents the findings of a study that investigated the accessibility and use of health information in the lower echelons of Primary Health Care in Uganda. An 'Interaction-value model' emerged from the study. The model was driven by the value and impact of information unlike previous information models which had been driven by information needs. 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 value of information is therefore the core category, while the moderation of constraints and interaction with sources for latent or apparent needs are the two main categories which make up the model. The study has also shown that health workers were generally active information seekers while women were mainly passive. The study concludes that the value of information, rather than needs or constraints, was the driving force behind the information processes reported. The various actions, which resulted from the value of information, were reported to have promoted health in many ways. The findings from this study have unearthed several areas for further research.

Background

Uganda had a population of about 24 million people in 2003, with a female/male ratio of 100/96. Over 80% of the population live in rural areas; hence Uganda is one of the least urbanised countries in Africa.

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 need health care; it is provided within

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the family, community or health units run by nurses and clinical officers. Over the years, information related problems in the health sector have raised the concern of information professionals, health workers and social scientists. Some have suggested that in order to implement the planned health strategies, there was a need to improve not only the health information services but also the understanding of why and how to use the information.

Access to information is an essential component of development; it is a human right, and it does bring about sustained development and socio-economic progress. The available literature shows that rural women's information activities have not attracted a lot of research. This study, therefore, attempted to bridge that gap.

Literature reviewed from Sub-Saharan Africa indicated a need for methodological improvements in research (Patrikios, 1985; Bosompra, 1989; Mutua, 1997) as well as a need for a deeper understanding and conceptualisation of information issues (Ngcobo, 1994; Kigongo-Bukenya, 1999). Consequently, a study was carried out in 2001 to investigate the accessibility and use of health information in the lower levels of Primary Health Care (PHC) service delivery in rural Uganda.

Methodology

A holistic inductive paradigm was used with a grounded theory analysis. Although the study took a grounded theory approach, it differed from the grounded theory as originally defined by Glaser & 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. The total sample was eighty-two (48 women leaders and 34 health workers).

Face-to-face interviews were conducted using an interview schedule that consisted of open ended questions and one relating particularly to health information critical incidents. Two sets were used: one for the women and the other for health workers. As a semi-structured (open-ended) interview method was used to collect data, it was preferred to do a cross-case analysis for each question in the interview schedule. This involved grouping and comparing answers given by different interviewees to common questions. The analyst then abstracted from the data and generated concepts and categories inductively. This was proceeded by open and selective coding, based on the original Glaser & Strauss (1967) approach.

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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, there arose a number of thoughts, ideas and questions about the categories and their dimensions and the phenomenon being studied. These included, among other things, relationships as well as variations between and within categories. These ideas and questions were carefully recorded in the researcher's 'notes' file, indicating the category or interview question(s) they referred 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.

Findings

The Model
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 the previous studies reviewed. However, what came out of the root was derived inductively from data.

The categories

Information 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 either 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 after they have got it they may then realise that they needed

it. Hence, from sources, information 'goes' to latent and apparent needs; the unmet needs may then lead to active information seeking from sources.

Furthermore, unmet information needs may become constraints to information use and vice versa, as discussed below 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% of the women interviewed habitually sought for health information actively. For the health workers, it was mainly for use in their professional activities, while for the women, it was for general health knowledge updating. However, some women with chronic illnesses like 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 will be noted, discussing constraints and moderators highlighted some overlap with information sources and needs.

Constraints
These are obstacles which (a) prevent a person from accessing information when they occur between an information source and the person; (b) intervene to prevent information use, that is, they intervene after information acquisition and processing, but before information use, hence stopping the information or knowledge from being put to use. Therefore two types of constraints 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.

As observed by Wilson (1997), the fact that sources of information are available and accessible and information is processed (i.e. incorporated into the user's framework of knowledge, beliefs or values) is no guarantee that
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the information will be used (i.e. lead to changes in the user's state of knowledge, behaviour, values or beliefs). In this study and for both women and health workers, the quality of information accessed constrained its use. Health workers reported that some of the information they accessed was too technical, irrelevant, inadequate, inapplicable, questionable or repetitive. Women also 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 information needs, while in others, unmet information needs led to constraints to information use.

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.

Moderators, like constraints, were divided into two: i) Moderators of constraints to information access, and ii) Moderators of constraints to information use.

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 authority 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 from door to door to ensure that information reached every member of their community. At a slightly higher level of abstraction, this 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 instituting and flourishing of an informal mechanism of health information provision.

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, attitudes and behaviour. This led to the various actions that put the knowledge acquired into practice or applied the information gained in various ways, which improved and promoted health. For example, when women received relevant health information, used it and found it valuable, they carried out various information dissemination sessions both formal and informal about, say, the causes and prevention of illnesses/diseases; so, they interacted with their networks to promote health. 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 in the case of women leaders interviewed, they involved interaction with individuals, groups and communities, fellow health workers and patients. 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.

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The study has therefore shown that the value of information drives information activities beyond information needs; that is, after information needs are met or satisfied. Health workers, for example, used a combination of sources (e.g. seniors or colleagues, seminar notes, textbooks/ handbooks and/or Continuing Medical Education sessions) for a single information need or a combination of needs. The information they received and used filled 'gaps' and solved the need. However, the information process did not stop after satisfying the need. Health workers reported that they went on to share with colleagues and told them how valuable the information was and how she/he had done this or that after using the information. Therefore, it is the value of information which drives the information activity after a particular information need has been satisfied.

In the case of women, it was interesting to note that some women, who accessed information passively and whose information needs were not quite apparent, reported that after using the information and finding it valuable, they shared it with others and disseminated it in various ways; hence overcoming passivity, and becoming active in the 'information chain'.

The next section summarises and discusses the key findings related to the model. Given the size limitation of the paper, however, a more elaborate discussion of categories and the evidence has been left out, but is available in the thesis (Musoke, 2001).

Discussion

Although initially there were five categories, 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) that a model should have one core category

> "The generation of theory occurs around a core category... Without a core category, an effort of grounded theory will drift in relevancy and workability... Most other categories and their properties are related to it... Upon choosing a core category, the first delimiting analytical rule of grounded theory comes into play: only variables that are related to the core will be included in theory. Another delimiting function of the core category occurs in its necessary relation to resolving the problem... Without a focus on how the core resolves, solves or processes the problem, the analysis can drift... instead of being forced to integrate around the problem" (p: 93).

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 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 tended 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.

Furthermore, although constraints appeared to be dominant in the data, they did not fulfil the second function of a core category, namely solving the problem of information access and use in the study areas, instead they negated the process and aggravated the situation. The value of information, on the other hand, triggered off various actions which impacted on a number of constraints, thereby enabling people to access and use information. In a few situations, however, constraints intervened and consequently overwhelmed the value of information. The model, therefore, consists of a set of related categories that, taken together, can be used to explain the phenomenon of health information access and use in rural Uganda.

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. The overall model which attempted to incorporate the above processes is illustrated below.

. Figure 1: A diagrammatic representation of the 'Interaction-Value' model

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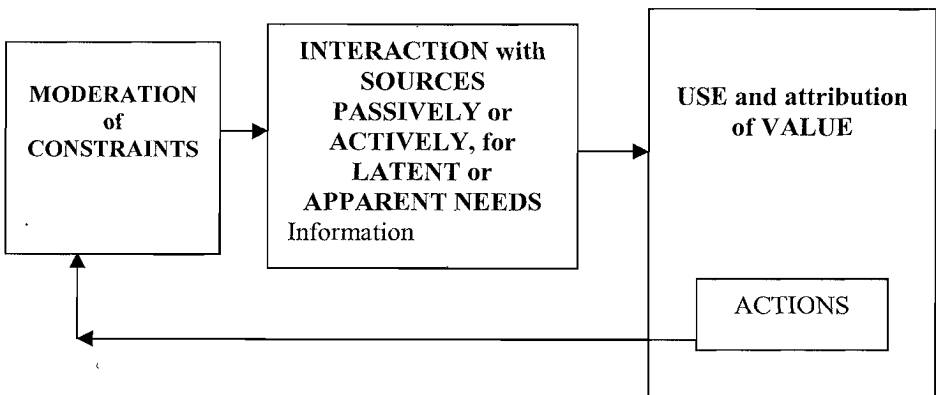
Although the study of women and health workers derived an overall model with the above core and main categories, the preliminary model for women differed in detail from that derived from the analysis of health workers' interviews. The major differences were in the details of each category that make up the model, and in the information behaviour. For example, the analysis of data from women revealed that they mainly accessed information passively except in critical situations when they actively sought information. Although women passively accessed information in most situations, the subsequent user behaviour was active as indicated under value of information and actions. Analysis of data from health workers, on the other hand, revealed a different information behavioural mode. Health workers mainly accessed information through active seeking, but some amount of health information was also accessed passively.

The differences in the details stemmed mainly from health workers' professional responsibilities, roles and activities, which are different from those of ordinary women leaders in the same rural areas. However, the fact that both models had the same core and main categories shows the internal coherence of the models and the general consistency of findings. This reinforces that the study addressed the key issues concerning health information access and use, hence providing support for confidence in the general validity of the overall model.

The model presents a process of human information behaviour, involving cognitive, affective and contextual factors. The interaction aspect of the model emerged from the analysis and interpretation of users' experiences as reported in the interview situation.

The findings of this study have highlighted how the interviewees interpreted and drew meaning from the information they accessed and used. The interviewees reported the difference information had made in their lives and professional work when they accessed and used it, but they also narrated the frustrations and consequences of failure to access and use the needed information. The findings, therefore, tend to orient the study towards the 'effect approach' to information. As highlighted under value of information, for example, once used, information had the capacity to achieve some effect on the user, as well as her / his acquaintances.

The meaning which the interviewees made of the information they received through interactions with others gives the study findings a symbolic interactionist perspective. Blumer (1969) highlighted three major premises fundamental to symbolic interactionism. These are: human beings act toward things 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 interactionists reason that virtually all interactions between human individuals involve an exchange of symbols. Attention is directed to the detail of interpersonal interaction, and how that detail is used to make sense of what others say and do. From the sociological point of view, the focus is usually on face-to-face interaction in the contexts of everyday life. Symbolic interactionism has been criticised for concentrating on small scale rather than large scale structures and processes. The major difference between symbolic interactionism and structural perspectives, for example, is that 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); otherwise, they both sprung from Language but got developed with different focus.

With this distinction, therefore, the findings of this study tend to support symbolic interactionist perspectives. This 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. Hence, the 'Interaction-Value' model that emerged from the study.

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 such as 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.

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The meaning of information for women and health workers, the factors and behaviours were highlighted in the findings. When women, for example, perform their roles as care-givers or leaders and carry out the commitments they entered into, they fulfil obligations which are defined by culture, local government (in case of LC leaders) and groups (in the case of group leaders). The information they access in the process, the meaning of that information to women, and the various dissemination activities that proceed the interpreting and attributing of value to information, were clearly demonstrated in the study.

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 and personal influence have been reported in mass media literature (particularly under the Two-step flow) as playing a major role in spreading innovations and bringing about technical and cultural change. Furthermore, the new interpretation about sources such as the media is that they are more likely to provide information than to shape opinion, that the media's influence depends on personal and social characteristics, and is not always direct; instead the media may first influence opinion leaders, who in turn influence other people (Defleur and Dennis, 1989).

In addition to the above, the findings of this study 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 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 and in 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) 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."*

It has been pointed out in mass communication literature that in the two- or multi- step flow models, individuals are not social isolates, but members of social groups in interaction with other people. Furthermore, that response and reaction to a media message may not be direct and immediate, but mediated through, and influenced by these social relationships (McquaiL and WindahL, 1981).

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 as Belderson (1999) reported:

> *"the influence of the social network as a source of information remains a comparatively neglected area. A number of publications has devoted some discussion to the influence of family and friends... but studies with a primary focus on this source are lacking. On some occasions, this source has even been deliberately overlooked (or) excluded"* (p.229).

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 by Haythornthwaite (1996) who pointed out that informal information exchange routes develop based on local needs

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"Information is made useful... by being forwarded to others... The need to exchange or receive information can lead to the establishment of new information routes. Network analysis describes these routes and the course of information... not just delivery from supplier to client, but also from client to relative, to subordinate, to superior, to friend, or to acquaintance, and from there to others" (p. 339).

Related to interaction and social networks was information behaviour. 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 personal or family incidents or situations, 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 several earlier works which focussed on active seeking as the principle mode (Wilson, 1997).

The findings, however, agree with those of Belderson (1999) who noted that a great deal of information research had concentrated on active seeking in which the search for information involves a conscious attempt to satisfy a pre-defined information need. In her study, participants tended to be confronted with information rather than actively seeking it.

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 is worth documenting is 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. Hence, although women mostly accessed information passively, their subsequent information behaviour was active.

On the other hand, health workers actively sought out most of their information. Their 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 (1992) 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. 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) 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" (p.555).*

Women's information behaviour in this study was also different from the blunters in the 'monitoring and blunting' theory (Baker, 1995) because the blunters deliberately avoid getting 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 a 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.

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The model can hardly be explained by purely information concepts. It is a multidisciplinary model (like several others in information science) with orientation to and concepts from sociology or social psychology, communication, behavioural science and to some extent gender and feminist approaches.

According to Glaser & Strauss (1967), the practical application of grounded theory, whether substantive or formal, requires developing a theory with at least four interrelated properties:

> *"the theory must closely fit the substantive area in which it will be used. Second, it must be readily understandable by laymen concerned with this area. Third, it must be sufficiently general to be applicable to a multitude of diverse daily situations within the substantive area, not to just a specific type of situation. Fourth, it must allow the user partial control over the structure and process of daily situations as they change through time" (p. 237).*

The 'Interaction-Value' model demonstrates its fitness for the phenomenon of information access and use (as processes which depend on the value of information) in its attention to the identification of needs and sources of information, the various constraints to information access and use, and the factors or structures that moderate the constraints to enable people to access and use health information. The model is understandable because it is made of concepts that are inherent in women's and health workers' everyday lives and work, which highlight the realities of an information environment in rural Uganda. It is general as a model that can operate in a variety of information contexts and cultures. Hence, it seems flexible enough to manage change and situational realities. Furthermore, it has potential and unexplored linkages to related information access and use phenomena or processes, such as in agriculture. Finally, the model provides some means of control of the information process by indicating the necessary components of information activities in everyday situations, as well as the moderators that regulate or intercept the constraints to information access and use. An information provider, for example, would be able to judge what information to provide in what situations, and would also be able to change the information strategy as the situation changes.

To evaluate the use and saturation of the model, other studies in related areas were examined as elaborated above. Furthermore, a number of information studies that have employed the Grounded Theory approach were reviewed. This approach enables researchers to build accurate or naturalistic models in information and other fields because of its ability to allow models to emerge from real world situations. In the current study, the model was derived from the experiences that interviewees had of their

information environment and the role of information in their everyday lives and activities.

Conclusion

The study has highlighted the value attributed to information by information users. This value has been demonstrated to have played an important role in the prevention of diseases and promotion of health. The study concludes that the value of information, rather than needs or constraints, was the driving force behind the information processes reported. The various actions that resulted from the value of information were reported to have promoted health in many ways.

The findings from this study have also 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 phenomena 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.

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 methodological approach used in the study proved meaningful for future application in related studies (Musoke, 2000).

Some areas for further research

A good research product is not just one that is said to be valid, it is also one that is productive in terms of generating new ideas and stimulating further research (Gidden, 1997). Several areas for further research were identified in the study; for this paper, only areas, which focus on the model, are presented:

❖ As hardly any research had been dedicated to health information access factors as well as the use of information by the population investigated in the study, more extensive research with larger samples should be undertaken to test the individual elements of the model that emerged from the qualitative data in this study. The model could also be applied to other rural areas in Sub-Saharan Africa, or to upper levels of PHC and/or in urban Uganda, and indeed in other parts of the world.

❖ The model that has emerged from the study has been able to illuminate issues beyond those that the study was originally designed to understand. For example, in addition to gaining insights into the information processes and behaviour's surrounding access to and use of health information, the model highlights the meaning and value of information derived from interactions between women and other women, Local authority (LCs), health workers, church leaders, etc; and health workers with their colleagues, juniors, seniors, members of professional associations, etc, which give it a symbolic interactionist perspective. The potential use of this social psychological and theoretical approach to information behaviour is something that needs further attention by information researchers.

❖ The 'interactivity' in the 'Interaction-Value' model 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 by... 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).

Studies to test this formula are recommended.

Lastly, social networks and their effect on information access and use have not received much attention by LIS researchers.

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