

## Chapter 1 Introduction

### 1.1 Background

Inappropriate health care, over-servicing of patients and over-utilisation by patients, coupled with high medical inflation, have led to a situation where the future of health care, as we know it, is in jeopardy. In many instances, health care has become unaffordable. It is generally believed that the only mechanism available today to ensure the continued existence of good quality health care is managed health care. Through managed health care

...the individual is helped to

- remain as healthy as possible;
- get healthy as quickly as possible after an illness;
- obtain high quality, appropriate health care; and
- keep health care affordable (*Finansies en tegniek*, 11 July 1997:10).

...the medical fund is helped to

- remain competitive in the market;
- ensure satisfied membership;
- control costs; and
- improve the quality of health care.

...the funders of medical aid are helped to

- get their money's worth;
- ensure a satisfied work force; and
- control absenteeism.

In principle, managed health care is an acceptable philosophy that supports cost-effective health care and simultaneously maintains or improves the quality of care. On the individual level, health promotion has become a critical component for reaching the aims of managed health care. The ultimate purpose of managed health care cannot be achieved without the cooperation and commitment of health care consumers.

Health promotion, with its focus on the consumer, is a pivotal point on which the success of managed health care and continued health care on the one hand, and improved health on the

other hand, depends. Through information and consequent behavioural change these ideals may be reached. However, the effective communication of health information to the public places a high demand on the utilisation of innovative communication channels and tools.

The fact that digital media have become readily available may lead to a temptation to apply new technology haphazardly to reach the aims of managed health care. However, 'technology should always be a tool – a means, not an end' (Swan, 1996:30). To prevent costly and inappropriate application of digital media, a sound knowledge of the advantages and disadvantages of each medium is required, as well as a sound knowledge of the requirements for successful communication in health care settings.

### **1.2 Problem statement**

Even though communication managers in the health care industry usually are well versed in traditional communication media and their attributes, the opportunities offered by electronic publications through digital media are often underutilised. This may be due to a lack of understanding the suitability to task of such media or a lack of knowledge about the media itself. The communications manager is often confronted with the decision on whether to use digital media and, if so, which medium, without having the necessary insight and knowledge to make such a decision.

To date, little research, if any, has been done to assist the communications manager/specialist in a health care setting in his/her choice of digital media. The purpose of this research was therefore to investigate the requirements of successful health promotion and the attributes of digital media available today, and to establish the contribution each could make towards the effective provision of information for health promotion. On the grounds of this research guidelines were formulated to enable the communications manager to apply digital media successfully.

The research questions therefore are the following:

- What are the requirements of successful communication for health promotion?
- Which factors influence the success of communication for health promotion?
- What are the attributes of digital media that could determine their suitability towards communication for health promotion?
- What contribution can be made by the various digital media towards effective communication for health promotion?

### **1.3 Methodology**

The research was based on a literature survey of digital media, digital communication, health promotion and the communication processes related to digital media.

As both managed health care and digital media are recent developments, the literature search on this aspect was limited to the last 15 years. Both these developments originated in the English-speaking countries. In the case of South African publications, Afrikaans sources were included. Communication *per se* and theories on health communication are not new disciplines or developments and therefore the survey of definitions and principles was not restricted to recent sources.

### **1.4 Definitions**

#### **1.4.1 Digital media**

An electronic publication is a collection of pages of electronic information in digital format that can be shown on a suitable screen. The means used to transfer or access the digital information is called a digital medium. Electronic publication usually takes place within a network environment, be it the Internet, intranet or extranet, or a smaller, private or local area network. Electronic impulses can also be transferred to other digital media, namely CD-ROMs and DVDs.

#### **1.4.2 Communication tools**

Originally tools were designed as extensions of human skills and talents. A communication tool therefore extends the human activity of communication. As a tool the computer has the ability to communicate world views and information from tool developers to tool users in order to assist the user in dealing with and understanding the environment. Essentially three types of communication are involved in computerised tools: Communication between tool developers and tool users, communication between tool users and tool developers, and communication among tool users (Day & Kovacs, 1996:vii).

#### **1.4.3 Health promotion**

Health promotion is the empowerment of health care consumers to increase their control over the factors that may influence their health, with the aim of improving their health and well-being. Health information is therefore needed to facilitate decision making, problem solving and the expansion of knowledge regarding the individual's personal health, the availability of health care

and the mechanisms for delivery. Through mass, group and personal communication, all levels of a community can be reached and educated to change behaviour towards better health for all members of a community, thus promoting health.

#### 1.4.6 Managed health care

Managed health care is a mechanism to ensure the continued existence of good quality health care at an affordable price. It is practised within the medical fund industry. It is defined as 'an arrangement through which utilisation of healthcare is monitored through the use of mechanisms which are designed to monitor appropriateness, promote efficacy, quality and cost-effectiveness of the delivery of relevant health services' (Prins, 2000:10).

### ***1.5 Organisation of chapters***

To determine the value and possibilities of digital media as communication tools for health promotion, it was first necessary to determine the inherent attributes, possibilities and status of the various digital media. A report of this research is given in Chapter 2. Health promotion is discussed in Chapter 3. Matters receiving attention include the development of managed health care, the health care environment, the objectives of health promotion within a managed health care environment and the needs and problems particular to the South African situation. In Chapter 4 follows an introduction to communication, the requirements for successful communication and an identification of the pertinent characteristics of digital communication. The characteristics, objectives and problems of health communication receive attention in Chapter 5. Considerations particular to health communication are discussed, as well as health promotion campaigns and health marketing. Advantages of using digital media as communication tools for health promotion are given in Chapter 6. This discussion is based on both the nature of the media and the nature of health communication. Digital media's suitability to task within health care settings is discussed in Chapter 7, followed by the conclusion in Chapter 8.

## Chapter 2 Digital media

### 2.1 Introduction

A medium is the means by which something is communicated (*The Oxford dictionary and thesaurus*, 1995:949). Media are utilised as an intermediary communication delivery system using some form of technology (Kreps & Thornton, 1992:144). As extensions to human communication, a medium is an object that carries a message, or which allows expression of a message and enables one to receive a message via one's senses. A medium is used to 'increase the visibility of a message, to promote its comprehensibility or to guarantee its distribution' (Fouconnier, 1985:45). It enables people to communicate with others who are far away, to receive messages, to access images and to reach more people in less time and through different time zones than through non-mediated communication channels. Modern health care services depend upon the use of media as communication tools, and it is expected that these uses and applications will continue to expand in the future (Kreps & Thornton, 1992:144).

Digital media are used to communicate messages that originated in or were converted into digital electronic impulses. 'Digital' in this instance refers to the representation of data 'as a series of binary digits' as used in or by a computer (*The Oxford dictionary and thesaurus*, 1995:405). Digital media currently available are CD-ROM, DVD, and the Internet.

Digital media are characterised by increased user control, specialised and extended content, speedy transmission, and non-linear access. The digital media of today have many attributes that enhance communication.

The first of these is multimedia, that is text, illustrations, video, sound and animation. This attribute has led to the creative utilisation of digital media for the dynamic transfer of information, knowledge, entertainment, assistance, etc. The use of multimedia enhances and facilitates the understanding of information because various senses are involved in the decoding of messages. Even illiterates may therefore benefit from digital media.

Interactive multimedia has the most impact, owing to the fact that participation enhances understanding and retention of messages. It is generally recognised that 'active learning provides a superior experience to passive learning, a notion that can be traced back at least as far as

Dewey' (Patkin, 1996:173). Students participating in 'responsive learning environments ... not only retain more information but also manifest a fuller understanding of the information presented' (1996:173). As in computer games (Friedman 1995:78; Phelan, 1996:41), interactivity renders an opportunity for 'role playing' in which the participant is given the opportunity to identify with the character on the screen. The challenge is to present the user with an opportunity to exert some control over the interaction with the information on the screen and/or with the power to make decisions that would influence the outcome. State of the art is virtual reality. These media are described as 'tools to amplify the mind' and 'computer-generated viewing devices, acoustical chips, and sensors that provide individual users with multiple sensory information – sound, sight, touch – to simulate real or fantastic environments' (Kramarae, 1995:36).

Another attribute of digital media is their ability to link stored messages in a non-linear manner, known as hypertext. Hypertext is software that allows many different texts, illustrations, sound, animation and video within a particular document, but also those in other documents, to be linked, so that new, related information can be accessed by clicking on a keyword, link or button. The result is a network of information, for example, the World Wide Web. The user can choose to read in many alternative directions (Friedman, 1995:74, 78). An advantage of hypermedia is that the user may choose to retrieve specific sections or levels of information.

In general, digital media save time and money. In an ever-changing society where information has to be up to date, electronic publications offer a considerable advantage. The same information can be used simultaneously by various users, thereby obliterating the need for costly duplication and storage of information. A potentially large number of users can therefore be reached.

Through digital media, complete documents of electronic publications become available online, without any time or geographic constraints. Information therefore becomes universally accessible and, through hypertext, virtually unlimited. It becomes available upon request and the distribution is effortless. Through printers connected to a computer, the information can also be delivered in a paper-based format.

Digital media today still have a number of disadvantages, such as uncertainty regarding the authoritativeness and reliability of information, copyright and, especially in South Africa, limited accessibility. In some cases the quality of the publications may be suspect, mainly due to the

quality of the hardware (e.g. low-resolution or small screens) being used to access the publications rather than the design and production.

Digital media can be used as mass communication tools, group communication tools or personal communication tools. A CD-ROM viewing over a large screen in a community clinic hall is an example of a large group communication medium. The Internet, although it has the potential to reach millions of people, and is therefore a mass communication tool, normally is experienced as an individual and personal communication medium at the instant of access. A DVD accessed in the family lounge is a small group communication tool.

Balint (1996:33) gives a list of elements that he considers to be some of the processes enhanced by digital communication:

- Acquisition of information;
- storage, sorting, merging and retrieval of transmitted information;
- translation, formalisation, re-recording, analysis, and re-synthesising of human-to-human messages;
- filtering, adjusting and correcting (as well as storage) of selected key facts from the messages;
- the transfer of mental models which is performed with high fidelity via suitable decoding/encoding of messages; and
- appropriate expertise (i.e. some form of artificial intelligence) and a related knowledge-base which can be built into the applied computer/interfaces.

## **2.2 CD-ROM**

CD-ROMs are flat, shiny disks of 12 cm in diameter on which information is stored in digital format on one side by way of a laser beam. They developed from the compact audio disk and the first one was demonstrated in 1983. They became commercially available in 1985. Recently, differently shaped disks, for example, oval ones, have also become available.

CD-ROMs contain text, illustrations, sound and video information. The information is accessed through a CD-ROM drive and interaction with the information is possible.

Advantages particular to CD-ROMs include their large storage capacity, excellent portability, durability, interactivity and quick access to information. CD-ROMs have an expected lifetime of 100 years and are therefore most reliable (*PC magazine*, 7 February 1995:254).

Initially, however, the hardware to produce and access CD-ROMS was expensive, CD-ROMS could only be written once and could only be used by one workstation at a time. Today most of these disadvantages are no longer applicable. Difficulties still experienced by users include unique interfaces and multiple retrieval systems. It is impossible to integrate the contents of multiple disks and they have to be managed and stored. It is fairly complicated to make CD-ROMs available over a network and therefore information technology expertise is required (Butter, 1994:76).

### **2.3 Digital Versatile Disk (DVD)**

A fairly recent development in digital media is the digital versatile disk (DVD). In appearance it resembles a CD-ROM but it contains more than 500 lines of horizontal resolution (*Finansies en tegniek*, 8 August 1997:57). A standard DVD holds about 7.5 times more data than a CD does, and there are different disk sizes available. Of these disks some can contain more than 4.7 gigabytes per disk. This capacity can be increased to almost 17 gigabytes on double and dual-layered disks (Brown, 2000; *PC magazine*, 12 March, 1996:34). One DVD could contain every song ever recorded by the Beatles, the entire Star wars movie trilogy or a stack of novels as high as the Empire State Building (*Beyond 2000*, 3 October 1997). This medium is considered ideal for huge, multi-language databases (*PC magazine*, 12 March, 1996:34).

The greatest advantage, however, lies in its possibility for interactivity (*Beyond 2000*, 3 October 1997). The user can decide on what he or she actually wants to focus. For example, should a demonstration be given of the correct method to administer an asthma inhaler, instead of watching the complete image the viewer can zoom in on the patient's chest to determine the correct breathing rhythm or on the hand holding the device to concentrate on the correct depression to release the medication, or on the mouth to concentrate on the correct position of the device in the mouth. As stated above, multilingual sound can be made available and can be chosen by the press of a button.

The initial penetration of DVD into the market occurred through the entertainment media. More than one million DVD units were sold in 1998 and sales of more than 6.5 million are expected for 2000 (Pescatore, 2000). Already numerous movies have been released in this format. Duplication of DVDs is even cheaper than video tapes (VHS), namely \$1.50 as opposed to \$2–\$3 (*Beyond 2000*, 3 October 1997). At present, however, DVD players are expensive at about R5 500 (*Finansies en tegniek*, 8 August 1997:57). Home recording systems have been available since the end of 1999 at a price of US\$2 400 (i.e. about R17 000) (Gray, 1999).

Although the first target for DVDs has been the entertainment market, it is believed that the high quality and ease of use will quickly bring new applications for corporate use, especially regarding training and marketing (*Finansies en tegniek*, 8 August 1997:57). With DVD, an integrated hybrid PC/TV system is coming closer to reality, a development that will change the face of broadcasting, home entertainment and information access dramatically (*Beyond 2000*, 3 October 1997) (see also 2.5).

## **2.4 Internet**

The Internet is a loose amalgamation of literally thousands of computer networks and millions of users throughout the world. The main purpose of the Internet is the distribution of information through standardised protocols. Information becomes accessible through navigators such as the World Wide Web, Gopher and FTP. The Internet is generally seen as an international but complex communication medium that has changed the speed, quality, processing, retrieval and transmission of information for ever. It is the main medium for the distribution of digital publications.

The Internet has already development into extensions, namely intranets and extranets. An intranet is an internal version of the Internet, a 'private' World Wide Web-based network that gives a company's personnel and business partners access to important company information, regardless of the platform being used, by converting company documents into HTML (*Finansies en tegniek*, 26 September 1997:41). An extranet is a combination of some components of an organisation's internal network with the network of a client(s) to form a seamless integrated system.

The World Wide Web is the most popular network accessible to the general public. Research indicates that over 50% of the pages on the Web contain graphic images, that the average home page contains 1 050 words and that over 87% of the pages are written in HTML. In the beginning of 1998, there were already about 50 million pages on the Internet (*State of the Internet*, 18 February 1998). In September 2000 there were 22 375 376 registered Internet domain names and over a billion documents on the Web (Inktomi WebMap, 2000; Netfactual, 2000).

The advantages of the Internet (and intranets and extranets) are consistent with the advantages of digital media in general.

Internet applications are, for example

- electronic mail (e-mail);
- electronic journals;
- electronic newsletters;
- electronic forums, bulletin boards and conferences (collectively called newsgroups);
- electronic document delivery; and
- electronic databases.

Research done in April of 1997 in Europe indicated that 38% of European companies use the Internet for trading with other companies, 37% for trading with consumers, 74% for communicating with clients, 85% for the collection of information, 45% for new market penetration and 62% to recruit new clients (*F&TNet*, 18 July 1997.)

In South Africa, the number of new subscribers to the Internet is growing by 15 000 per month. In 1997, the number of dial-up users was 100 000 and five to six times more had access through fixed lines at their places of work (*Finansies en tegniek*, 5 September 1997:63). South Africa's growth is determined by the technology revolution, the electrification process and the growth of the telecommunication network (*Finansies en tegniek*, 22 August 1997:22). Schools, clinics, libraries, and community centres were identified by the South African government as priorities for the telecommunications network (*The Citizen*, 21 January 1998b:12). In the government's framework for the development of a national information and communication strategy, 'attention is given to the improvement of the technology capacity of the government, improving service offered to all citizens by offering a one-stop shop through the use of smart cards and public information terminals, and developing legislation on cyberlaws' (Mason, 1998).

Of importance to any company wishing to educate and change the behaviour of people is access to young people. Many efforts are underway to connect South Africa's schools to the Internet. By the end of 1996 only 1% of all schools in the country had access to the Internet. In the Western Cape, 53% had access, in Gauteng 20%, Eastern Cape 18% and KwaZulu Natal 8%. However, a number of projects are underway to increase connectivity drastically (Acacia Activity Database, 2000; *Finansies en tegniek*, 4 July 1997:51; SchoolNet press release, 1999).

Studies indicate that the Internet is used firstly for communication and secondly for information (*State of the Internet*, 18 February 1998). The commercial sector is believed to be growing at a faster rate than any other sector (*Internet statistics*, 18 February 1998).

The most serious problem experienced with the Internet in South Africa is the slow speed of retrieval, mainly due to insufficient bandwidth. To exacerbate the problem, South Africa does not have a local peering point, which means that Internet traffic has to be relayed through overseas countries before local information can be retrieved (*Finansies en tegniek*, 17 October 1997:9).

The sheer size and scope of the Internet have led to new initiatives to split the access routes to the Internet into two: one that gives access to serious communication and information and the other to entertainment. The plans are known as Internet2 and Next Generation Internet (NGI) in America and the TEN-34 Consortium in Europe. These initiatives plan to make real-time video, sound and virtual reality available at 2.4 gigabytes or more per second (*Sake-Rapport*, 29 March 1998:14). High-speed modems are also being developed by Intel, Compaq Computer and Microsoft (*The Citizen*, 21 January 1998a:12).

Particularly for the commercial and health business sector, security has been a problem until now. However, many solutions are forthcoming. Mitsubishi Electric Corporation in Japan, for example, has developed a fingerprint identification system for the Internet to verify access to membership services. This system could replace passwords (*The Citizen*, 16 February 1998:16).

### **2.5 Added value of integrated digital media**

Balint (1996:33) sees the role of intelligent machines as bridging gaps in mental models. 'A sufficiently capable computer ... should translate, formalise, analyse and re-synthesise human-to-human communications. Such machines would need to capitalise upon knowledge of communicating individuals' mental models to make adjustments for messages exchanged...' (Day & Kovaks, 1996:viii). In digital communication, the source and target of communication can be human or machine (Balint, 1996:33). The ideal is where the two interact seamlessly, that is, human-to-computer, human-to-human (via a medium), computer-to-computer, computer-to-human. This is also the aim of fully integrated media.

In practical terms this means that a user will be able to access both the Internet and a television programme from a single hardware apparatus, send a voice-input e-mail message and phone a

friend from this hardware, etc. If such hardware incorporates the characteristics of all digital media (e.g. CD-ROM, the Internet, DVD), it would add immense value for the user. Current developments in digital television (DTV) in the USA seem promising. In addition to television data, Web content, stock reports, electronic coupons or even a telephone directory can be sent using 'opportunistic' or left-over bandwidth. In other words, both television and non-television data, or a combination, can be accessed (What is digital television?, 2000). Clearly these developments are another step in the direction towards fully integrated media.

A new form of integrated media is already available which may have a positive influence on health communication, namely that of wireless application protocol (WAP) technology. 'Wap is a set of application communication protocols that allow wireless and hand-held communication devices (like all phones, pagers and handheld PCs) to access Internet services and information, and Web sites to format content so that it can be read on these devices' (Melzer, 2000). According to Melzer, the SA ratio of mobile phones to personal computer is roughly five to one.

## **2.6 Evaluation**

Although digital media have not yet reached their zenith, they offer many advantages. Aspects that have a bearing on health promotion are the following:

- Digital media are communication tools;
- information in analogue format can be converted to digital format;
- interesting presentation of information takes place through multimedia;
- multimedia enhance and facilitate understanding because various senses are involved;
- multimedia carry messages even for illiterates;
- interactive multimedia enhance understanding and retention of messages through user participation;
- interactive multimedia facilitate role playing and identification with a particular person or situation;
- interactive media may empower a user to make decisions regarding information presented by the medium;
- hypermedia present the possibility to retrieve specific sections or levels of information;
- digital media save time, and information can be kept up to date;
- digital media save money regarding distribution, storage and printing;
- the same information can be used simultaneously by various users in various digital publications;

- there are no time or geographic constraints;
- information is available upon request;
- digital media can be used as mass, group or personal communication tools;
- processing of transmitted information is uncomplicated;
- pre-printing processes are cost and time effective;
- the fidelity of messages can be ensured to a great extent;
- the design of the publication and the interface could enhance communication;
- CD-ROMs have large storage capacity, durability, portability, interactivity and give quick access to information;
- DVDs can be used for huge databases, especially multilingual ones;
- DVDs have enormous potential for interactivity;
- with DVD, an integrated hybrid PC/TV system is coming closer to reality; and
- the Internet facilitates document delivery.

If these attributes of digital media are needed for and can indeed be applied to ensure successful health communication, digital media have an important role to play in the promotion of health. However, before an assessment can be made of their contribution to the communication of health information, the connection between health communication, health information and health promotion had to be investigated. In the following chapter, health promotion is explained as well as its place within managed health care, and the relevant connections.

## Chapter 3 Health promotion in managed health care

### 3.1 Health promotion

In the Ottawa Charter for Health Promotion of 1986, health promotion is described as 'the process of enabling people to increase control over the determinants of health and thereby improve their health' (Meyer-Weitz 1995:6). Health promotion can be seen as 'any deliberate intervention which seeks to promote health and prevent disease and disability' (Tones 1986:3). It incorporates health education and 'any combination of health education and related organisational, economic and environmental supports for behavior conducive to health' (Finnegan & Viswanath, 1990:18).

Such a wide definition ties in with the World Health Organization's well-known definition of health, namely, that it is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

Within health promotion, a number of approaches or perspectives are possible (Tones, 1986:3).

The focus could be on

- positive health in which well-being is advocated rather than avoidance of damage-causing behaviour, for example, doing exercise for pleasure rather than protection of one's cardiovascular system;
- the development of performance indicators and the development of specific objectives, for example, to decrease the number of heart attacks of a population by 20% by bringing the total cholesterol level of a population down to below 5.2 mmol/L;
- the adoption of media-marketing approaches, such as 'do not drink and drive' campaigns;
- the use of political tactics to achieve social and environmental change, for example the approved medication list to change the economic environment of health care; and
- a belief in the importance of community participation (e.g. the supply of clean drinking water to disadvantaged communities) and the demystification of medicine.

The scope of health promotion was detailed at a conference on primary health care at Alma Ata in 1978 (Tones, 1986:5). Five principles were identified, namely, that

1. health promotion should focus on whole populations rather than on disease-specific at-risk groups;

2. all the factors influencing health should be addressed to create an environment conducive to health;
3. health promotion requires the full participation of a community, that is, both individual and collective participation;
4. health promotion must use a wide variety of complementary strategies and agencies, for example, communication, education, legislation, and community development; and
5. medical professionals have a part to play in health promotion through education and advocacy, especially on the primary care level, but because of their orientation towards disease prevention, their contribution should be limited.

From the above it is clear that health promotion is an integral part of health care and its goals encompass preventative health, curative health and rehabilitation. Efforts of health promotion are directed at both whole populations and their environments (macro level), and individuals. Programmes of health promotion therefore focus on influencing the health choices of individuals (singly or in small groups) and on the individual's environment (Tones, 1986:6). Through health promotion, a change is sought in individual behaviour that would promote health and well-being.

It is obvious that a variety of people are involved in health promotion, for example, town planners, politicians, legislators, health workers, administrators, communication specialists, journalists, health educators, and medical and health care professionals. Nevertheless, the task of health promotion has more often been left to public health agencies, government departments of health and welfare and governmental health care programmes. In recent times, other health organisations such as managed health care companies have entered the field of health promotion to further their own cause.

### ***3.2 Developments in health promotion***

In the beginning of this century, the focus in health promotion was on 'disease as a culturally defined anomalous or deviant condition that had behavioral ramifications for both patient and health-care provider' (Finnegan & Viswanath, 1990:17). The doctor was expected to reduce the symptoms through his/her diagnosis and treatment of the patient who would then perceive him-/herself as recovering. However, after World War II the focus shifted to the behavioural aspects of health because research indicated that many adult chronic diseases could be attributed to lifestyles. Therefore, an objective of health promotion is to persuade the individual to adopt a particular lifestyle that would prevent disease (and thus reduce mortality and illness in the

population as a whole) and ensure compliance with medical advice and treatment, thus making possible the management of diseases. This objective has the additional advantage of financial savings and a potential of reducing the demand on health services (Tones, 1986:7). This first approach seeks to encourage only healthy, disease-reducing decisions, sometimes with hard-sell techniques, within a participative model of health education, promotion and delivery, as was adopted by the World Health Organization in 1983 (Brown & Einsiedel, 1990:166). However, the task is 'not only one of influencing individuals to change their personal risky habits, but of influencing change in the larger social and cultural environment that formed risky behaviors in the first place'. In other words, the idea is to change the health of communities through the influence exerted by individuals. On the other hand, social and cultural influences are considered crucial in learning and adopting new behaviour patterns (Finnegan & Viswanath, 1990:17, 20).

In the second approach to health promotion, the emphasis is on freedom of choice and the provision of information to facilitate informed health decision making (Tones, 1986:8). This approach developed concomitantly with the personal freedom movements of the sixties. Unfortunately the ideals of this approach are often hampered by environmental factors such as poverty, limited resources and knowledge or insufficient life skills. Supplying the necessary information is normally the task of the health communication manager/specialist.

Information theory offers a particular definition of information that is applicable to health decision-making: 'Information is a measure of uncertainty, or entropy, in a situation' (Littlejohn, 1992:50). This means that the greater the uncertainty in a given situation, the more information is needed and, conversely, when a situation is completely predictable no information is needed. In this sense, the information consists of the number of messages needed to completely erase the uncertainty in a particular situation. However, the more information available, the greater the number of choices possible within a given situation. For informed decision making, the right amount of information, at the right time, is necessary.

The third and most recent approach addresses the 'fundamental social issues underlying disadvantage and ill health ... so that people in communities become aware of the ways in which their health is damaged by adverse social circumstances and come to realise how their potential remains unfilled through inadequate services and life opportunities' (Tones, 1986:8). If a community could be mobilised to act as a change agent, positive social and behavioural outcomes in health may be achieved. In health promotion, the networks of private and public organisations

and special interest groups that control the resources of the community are harnessed and coordinated to activate interpersonal, group and mass communication dynamics, thereby influencing the rest of the community to adopt the desired changes (Finnegan & Viswanath, 1990:20).

In combination, the three approaches result in an integrated community-centred approach to health promotion. The scope is broad; it surpasses the traditional privatised relationship between the service provider and client. Health no longer is merely the presence or absence of disease, but 'well-being', 'quality of life' and a 'community resource' (Finnegan & Viswanath 1990:20, 21). Through health promotion 'relevant health information is disseminated to those individuals who can best utilize such data to reduce risks and to increase the effectiveness of health care' (Kreps, 1990:187). These individuals are empowered to exert greater control over their own health, making personal choices within an environment that influences the decisions (Thornton & Kreps, 1993a:205). In health promotion, it is also true that the personal health choices of individuals influence the community, which in turn influences the environment.

It is clear that health is a 'set of collective behaviors that are formed and influenced through communication processes in the context of aggregate social relationships and contacts' (Finnegan & Viswanath, 1990:22). Social relationships are formed through communication. This emphasises the need for varied communication processes, indicating the inevitable link between health and communication. 'Communication is central to the entire enterprise, whether it be in affecting individuals' decisions or in affecting antecedent social and cultural conditions or public policy to make community environments supportive of healthier behaviors' (Finnegan & Viswanath, 1990:21).

For health promotion to take place, the public must have sufficient health information and the necessary attitudes and skills to use this information effectively in the management of its own health. From a system point of view, health information is the system input and health education is the system process to facilitate the desired system output, namely health promotion (Kreps, 1990:193–194).

Although the ultimate aim of health promotion is the health of a whole population, all health interventions and encounters, between individuals, between individuals and groups, between groups and other groups, etc. constitute health promotion (see 3.1). Health promotion campaigns

target whole populations but the health communication that takes place between, for example, a doctor and a client is also considered health promotion.

### **3.3 Managed health care**

#### 3.3.1 Short historical overview

Managed health care came to the fore in the late eighties–early nineties as a method of containing costs and ensuring quality of health care. Its development flowed logically from developments in the medical fund industry.

In the 19th century, health care was considered a luxury, mainly because doctors were few and far between. Gradually they became more accessible, the science of medicine itself improved, transport improved and many people moved to towns and cities. Before long, many people came to believe that medicine or an operation could cure their every health problem.

Unfortunately this ready access to health care was considerably more expensive than the traditional home care. Soon it was impossible for most people to afford this type of health care and employers then started to offer medical aid as a fringe benefit to their employees.

A medical fund can be described as a health insurance system to which a group of people (and usually their employers) contribute a premium per month. In the past all contributions were paid into a single fund from which money was made available for the health care expenses of members of the group when needed. In other words, the principle of cross-subsidisation was applied. As contribution rates kept rising owing to medical inflation and over-utilisation by some members, healthy and young members became increasingly dissatisfied at this principle and started to threaten resignation from the fund. This would leave the fund with only high-risk, high-claiming members, a situation that would lead to further increases in contribution rates.

A solution was sought by limiting some services and products. Typical examples are that a fund would limit each member and each of his/her dependants to one pair of spectacles per fund year, or it would limit a family to medicines of R3000 per fund year. To some extent this ruling curbed the extravagant spending of members but unfortunately it was prejudiced against the really ill person, for example, someone suffering from a chronic disease such as diabetes. Medical funds therefore decided to split the members' contributions into two parts. One of these was paid into a

medical savings account for the exclusive use of the member and his/her dependants (*Finansies en tegniek*, 15 August 1997b:41); no cross-subsidisation took place. The money in this fund had to be used for those expenses that a member had at least some control over, such as visits to a general practitioner, normal dental services and medicines for short-term illnesses such as eye infections, colds and flu. The rest of the member's contribution went into a risk pool from which hospitalisation expenses and expenses for serious illnesses were paid. Usually a member had no or little control over the expenses for this type of service.

At first this system seemed like the perfect solution, but many members did not understand the fairly complicated new-generation system and ran out of money in their savings accounts by the middle of the fund year. The dearth of reliable, easy-access information to help members stay healthy and save on their day-to-day health care costs became apparent. Costs to be paid from the risk pool also kept rising. It became evident that with the over-servicing of patients some treatments were duplicated, were detrimental to the well-being of patients and neglected a holistic approach to health. The only solution left was to strictly manage health care — resulting in managed health care. Managed health care is the application of management principles to the provision of health care services in order to manage the quality, cost and accessibility of health care. It is a mechanism to ensure the continued existence of good quality health care at an affordable price.

The following areas of health care can be managed: Diseases, priority groups, medicine, hospitalisation and providers/practices. Some medical funds developed their own managed health care services but independent companies specialising in managed health care were also formed.

### 3.3.2 Managed health care companies and health promotion

Managed health care companies (whether as an in-house ability or independently) have a vested interest in health promotion. The reason can be found in their objectives:

1. To help the individual to remain as healthy as possible, get healthy as quickly as possible after an illness, obtain high quality, appropriate health care, and keep health care affordable;
2. to help the medical fund or administrator of a medical fund to remain competitive in the market, ensure satisfied membership, control costs, and improve the quality of health care; and
3. to help the funders of medical aid (usually employers) to get their money's worth, ensure a satisfied work force, and control absenteeism.

Apart from the above interdependent roleplayers, another important player is the service provider (e.g. doctor, dentist, specialist, physiotherapist, hospital, clinic, homeopath, blood transfusion organisation, emergency room, ambulance, etc.). Traditionally, the doctor played the most important part in health promotion but, owing to the developments in health promotion (see 3.2), the increased importance of health promotion for the management of health care (see 3.3.1), and the barriers (noise) experienced in the communication between patient and service provider (see 5.8), managed health care companies identified the need to enter the arena of health promotion.

Their health promotion efforts usually focus on

- the system of health care, that is how it works;
- consumerism matters, for example savings, benefits, doctor–patient relations; and
- health matters, for example self-care, prevention, disease management, treatment compliance and rehabilitation.

### 3.3.3 South African managed health care and health promotion

'Less care is not necessarily better care, often more care can be worse care.

I believe we need the managed care tools in South Africa'

Tuft (*Managed care review*, n.d.).

Since South Africa's emergence from world isolation, international trends in managed health care have begun to have an increasing impact on the local industry (Brennan, 1997:3). According to Tuft (*Managed care review*, n.d.), Chairman of the Private Practice Committee of the Medical Association of South Africa (MASA), 'the market forces driving managed care are irresistible and it is in the [medical] profession's interest to introduce the system in co-operation and not to oppose it'. Indeed, managed health care is a fact of life in South Africa today.

Throughout the world, some or other form of health insurance is becoming a determinant of access to care (*Managed care review*, n.d.). With the standards of government-provided health care deteriorating at an alarming rate (*Rapport*, 12 July 1998:10), the onus is on the individual to provide in his/her own health care needs. In South Africa only 20% (7 million) of the population belong to medical funds (*Finansies en tegniek*, 28 March 1997:25; 2 May 1997:38), but it is once again becoming increasingly impossible for the man in the street to afford contributions to a medical fund. In 1982 a member's contribution to a medical fund constituted approximately 7.1% of his/her salary; in 1996 this percentage rose to 17.3% (*Finansies en tegniek*, 11 July 1997:10).

Over the past two decades, contributions have increased by more than 22% per year (*Finansies en tegniek*, 15 August 1997a:44). It has become critical to keep high quality health care affordable within the private health care environment.

Runaway medical inflation is a major contributing factor to the South African dilemma of rising health care costs. Medical inflation stood at about 30% in 1997 despite the fact that the total inflation rate for South Africa was less than 10%. The technological environment has a major influence on the cost of health care in South Africa. The quality of modern health care relies to a great extent on expensive technology that may range from emergency call mechanisms, to payment systems, expensive surgical apparatus and telemedicine. The traditional fee-for-service system of health care has contributed to the cost increases because health professionals were paid regardless of the outcome of their treatment. Although a capitation or a managed fee-for-service system is preferable, as opposed to the traditional fee-for-service system, the necessary co-operation and networks are only now becoming a fact.

Over years of fee-for-service payments, a culture of over-utilisation has developed on the part of medical fund members. This may have stemmed from the complete trust being placed in the medical profession and members' unwillingness or impotence to take control of their own health. The attitude of medical fund members will have to be changed before this trend will stop. Over-servicing by doctors, dentist, specialists and other health professionals is also prevalent (*Finansies en tegniek*, 11 July 1997:10). So-called 'doctor-hopping' and overlapping of services and medications compound the problem.

The ratio of doctors to population in South Africa is low. Therefore the supply and demand principle becomes a contributing factor in the cost structure.

The demographic distribution of medical fund members in South Africa influences utilisation patterns. For example, specialists, who practise mostly in urban areas, are more readily consulted by members residing in the same city or town than by members from rural areas, leading to the conclusion that the proximity of or easy access to service providers may increase utilisation.

The diverse nature of the South African population is a major problem in the delivery of health care information. The South African health care consumer comes from all walks of life and the new

socio-political dispensation has brought many formerly excluded members into the medical fund fold. The literacy levels of the South African population are as diverse as their languages.

Although the previous socio-political dispensation is often blamed for all the woes of health care in South Africa, world trends have also made their influence felt. For example, as life expectancy increases in the number of people aged 65 and older and the growth in population is stemmed, health care costs can be expected to increase (*Pretoria News*, 13 January 1998:7). Already the number of elderly members (continuation members) has grown considerably in South African medical funds in relation to the active members.

The health care information needs of South Africans are vast. In South Africa as a whole, the Economist Intelligence Unit has found in the first quarter of 1997 that the health status of South Africans is the lowest of 27 countries tested. Health information campaigns on, *inter alia*, immunisation, STDs and hygiene are urgently needed (*Finansies en tegniek*, 11 July 1997:10–11). Health education efforts will have to be accelerated to improve the health status of the total population. The gaps in health care knowledge will have to be filled by the cost-effective supply of health care information. If managed health care expects the member to consult the service provider less often, it has to provide an alternative that not only gives the member information and education, but also peace of mind (*Finansies en tegniek*, 15 August 1997c:43). Taking the diversity of the South African member population into account, such information should be user-friendly, in layman's terms, preferably orally provided, widely distributed and available at various literacy and educational levels. At present, most managed health care companies in South Africa make use of a 24 hour telephone line to render this type of service.

#### 3.3.4 Managed health care and information technology

Although telephone access to health care may be one of the delivery mechanisms, it is by no means the only possibility. In a television interview on SABC3, Dr Nkosasana Zuma, then Minister of Health said that South Africans must not think that new technology should not be applied in developing countries. Rather the opposite is true – we should utilise technology to supplement scarce resources. The Minister of Communications, Ivy Matsepe-Casaburri, urges South Africans to embrace the Internet with these words: 'We must be "dotcom" ... or else we are likely to be "dot-dead"' (*Time*, 22 May 2000:11).

According to Raghupathi (1997:81–82), a 'revolution is taking place in the health care field with information technology playing an increasingly important role in its delivery.' In 1996, the health care industry spent between \$12 billion and \$16 billion on information technology.

One of the applications is a 'universal electronic patient record', containing all a person's health information and which is accessible through a smart card. 'Moreover, by including patients and allowing them not only to access their data, but also to post reports and queries, patients can become better educated and more empowered to manage their own health' (Kilman & Forslund, 1997:112).

Apart from the demands of health care providers and funders, Raghupathi (1997:81–82) acknowledges the fact that, 'in today's information intensive society, consumers of health care want to be better informed of their health options and are, therefore, demanding easy access to relevant health information'. He continues: 'The challenge lies in using various forms of IT to organise, store and present health information in a timely and efficient manner for effective health related decision-making.'

### **3.4 Evaluation**

Although managed health care companies usually are committed to health education and the provision of health information, developing, storage and distribution costs often hamper health promotion. The funds available should be optimally utilised to reach the objectives of managed health care and health promotion. From various sectors, South Africans are urged to take up the challenges offered by digital media in order to supplement scarce resources.

From the discussion above, the following factors are identified that may influence the design, impact, reach and exposure of communication intended for health promotion:

1. Health promotion should encompass individuals, groups and communities;
2. health promotion should focus on all issues regarding health, disease and treatment, facilitate decision-making, elicit the participation of individuals, groups and communities;
3. health promotion should empower health care consumers to make the right decisions regarding their own health;
4. health promotion should aim at behavioural and attitudinal changes regarding health and the utilisation of health services and medical fund benefits;

5. health promotion could target specific opinion leaders in communities to function as change agents;
6. health promotion should be available in various languages and levels of literacy and information literacy; and
7. user-friendly and cost-effective information is urgently needed.

It is evident that health promotion is a *sine qua non* for the success of managed health care. Health promotion consists mostly of health communication. An understanding of communication can help to ensure the success of health promotion. In the following chapter, therefore, communication is the focus; first communication in general and then digital communication.

## Chapter 4 Communication

### 4.1 Introduction

As communication is studied as an integral part of many disciplines (e.g. psychology, sociology, information science and computer science), definitions differ from discipline to discipline, depending on the particular perspective needed. Communication *per se* is not a new discipline and therefore older definitions still hold true. Fouconnier (1985:28) is of the opinion that a definition of communication will suffice if it is

- useful within a specific view, approach, etc.;
- logical and coherent;
- not contradicted by reality; and
- if it clearly distinguishes communication from other social phenomena.

In the light of the above, some of the existing definitions that refer directly or indirectly to both communication and information are the following:

Communication is the transmission of information, ideas, emotions, skills, etc. by the use of symbols, words, pictures, figures, graphs, etc. (Steiner, in Fouconnier, 1985:29).

Every communication act is viewed as a transmission of information, consisting of discriminative stimuli, from a source to a recipient (Newcomb, in Fouconnier, 1985:30).

Human or social communication is a process in which a source tries to make data available to a recipient by means of a channel, signs and symbols, with the intention of letting the recipient process the data into information with a meaning intended by the source (Fouconnier, 1985:167).

For the purpose of this research, communication can be described as:

The purposeful transmission of messages by means of symbols from a source to a recipient by means of a channel.

(An explanation of digital communication is given in 4.3.)

Communication can be explained by describing the participants or the number of participants in the process of communication, for example, intraspecific (in this case taking place between humans); intra-personal, interpersonal, group, categorical mass and mass media communication; or one-to-many, many-to-many and many-to-one communication. Communication takes place between a source and a recipient/receiver. The recipient(s) can be termed the target audience and is an important determinant of the communication process.

Other descriptions refer to the capacity of the communication channels, volume of the messages, network structure of communication (e.g. one-way, two-way, vertical, horizontal or diagonal), or the milieu in which the communication takes place (e.g. health promotion and adult education).

Health promotion takes place within the system of health care. A system is a set of objects that interrelate with one another to form a whole. It can be either closed or open. An open system interacts with its environment from which it takes and gives matter and energy. The system is affected by and affects the environment. The system is more than the sum of its parts and the parts of the whole are interdependent. When one variable in the system changes, the others are affected. Components from within or from the environment may upset the balance of a system. It is then necessary that a system change and adapt to reach its final goal (Littlejohn, 1992:40–45).

However, to stay steadfastly on the road of achievement, the system needs a method of control, or feedback. Through feedback, the system can adapt in order to reach its goals. Feedback is the knowledge gained by the source of the result of the communication process which was set into motion (Fouconnier, 1985:85). Feedback is especially important where behaviour is concerned. Some feedback may result in active behaviour (purposeful and random) and some in passive behaviour (a response to stimuli). Feedback may also be classified as positive or negative. Negative feedback indicates a deviation from the goal set for the communication. 'In a complex system, a series of feedback loops exist within and among subsystems, forming networks. At some points the feedback loops are positive, at other points negative. But always, consistent with the basic feedback principle, systems output returns as feedback input' (Littlejohn, 1992:45–49).

#### **4.2 Effective communication**

It stands to reason that not all communication is equally effective. When people attempt to change the attitudes and/or behaviours of others, communication becomes the vehicle of change (Burgoon *et al.*, 1994:16). With such a specific objective as health promotion in mind, successful

communication would be to the advantage of both the source and recipient. To reach the objectives of health promotion within managed health care, successful communication must be ensured as far as possible.

What then constitutes successful communication? According to Fouconnier (1985:34), successful communication has taken place when the specific ideas existing in the mind of a speaker (source) have been transferred to the mind of an interpreter (recipient). However, successful communication is hampered by noise or interference that occurs in the channel, distorting the message and consequently making decoding difficult. In a broader sense, noise may range from audible noise to semantic incapacities of the source or recipient or cultural differences between them. Burgoon *et al.* (1994:33) define noise as any additional stimuli in the channel that can disrupt the accurate reception of the message.

To compensate for noise, a signal could be intensified or repeated, using different signals to convey the same message (Fouconnier, 1985:46). Sometimes the noise or its nature and extent can only be perceived after feedback. For example, patient non-compliance to drug treatment may only be perceived when the treatment protocol's expected outcome is not achieved. Only then may it become apparent that the patient did not understand the instructions for drug taking.

The effectiveness of communication can be enhanced by using positive or negative reinforcement based on feedback. Positive reinforcement occurs when people are rewarded for making the appropriate or desired responses. In negative reinforcement, the recipient is threatened with an undesirable situation for making the wrong response. The recipient is given the opportunity to behave in the desired way. Punishment occurs only after the recipient has responded in an undesired way. Immediate response, as in a dyadic communication situation, increases the speed of learning. Specific reinforcements linked to specific desired responses are more effective than vague ones. Attitudes and behaviours are shaped by positive or negative reinforcement (Burgoon *et al.*, 1994:214).

On a personal level, five factors can be identified that contribute towards successful communication in general (Burgoon *et al.*, 1994:16, 33, 96, 119–120; Fouconnier, 1985:47):

- Communication skills (speaking, writing, listening, reading). These are essential skills in any communication situation. Listening involves hearing, comprehension and retention, but most

people have poor listening habits, owing to a lack of formal training in listening. Variables that may affect listening are the quantity and difficulty of incoming messages.

- Attitudes (towards the self, the subject, the source and the recipient). Attitudes include values, norms and beliefs. If a message to change behaviour contrasts with a strong belief, it is extremely difficult to convince the recipient to change his or her behaviour. Psychological disposition and previous experience will also affect the perceptions of those participating in the communication process. Recipients more accurately retain messages that are favourable to their self-image. Medical funds, for example usually design their communication strategies according to feedback from attitude and perception analyses conducted from time to time among their members.
- A minimum shared knowledge base. A shared code (or codes) of symbols is the very basic requirement for people to understand each other and for successful communication to take place. Symbols may consist of language, graphics, emoticons, etc. There must be a compromise of meaning among communicating people because each individual responds to the symbols of reality in unique and personal ways. Language provides those speaking the same language with a shared system of interpreting symbols, but each person invests a word with different meaning. We tend to view words as reality instead of abstract symbols of reality, a situation that may lead to misunderstanding. Specific terminology to convey a message should be known to both source and recipient. In managed health care, for example, the meaning of terms such as health, self-care, benefit, pre-authorisation, acute medicine and chronic disease must be shared among the communication participants. Perception analyses are also used to gain information on members' comprehension of terminology.
- Socio-cultural factors. These may have an influence on the ways of communicating, for example, the recipient's position within the social system may be one of opinion leader or head of a household and this may influence the success of the communication.
- Cultural environment. The culture of a community may influence the reception of communication. For example, in restrictive, prescriptive, conservative and liberal cultures the same message could be received differently.

In mediated communication, additional factors are

- access to the necessary technology; and
- proficiency in the use of the technology.

#### 4.2.1 Participants in communication

According to Burgoon, *et al.* (1994:31–32), 'communication is a process that involves a shared code, or codes, of verbal and nonverbal symbols. The meanings of symbols are in the people who use them, not in the symbols themselves; meanings are in people'. This quotation emphasises the importance of people in the communication process. Three types of participants can be identified, namely recipient (target audience), source and gatekeeper.

For managed health care to communicate successfully, knowledge of the target audience is of paramount importance. 'Without the receiver there would be no transfer of meaning. To some extent, the receiver exerts a degree of control over the source, and both receiver and source must accommodate each other in the communication transaction' (Burgoon *et al.*, 1994:95).

Knowledge of the target audience can be gained by profiling individuals, groups of recipients or populations. From demographic information (age, sex, social background, economic background, racial, ethnic and employment factors), generalisations and predictions can be made about, for example, an audience's probable access to electronic media or an audience's attitude towards family planning. Knowledge about recipients improves predictions of audience reaction and assists in making communication more effective for specific audiences (Burgoon *et al.*, 1994:96).

In mass communication, there is often a recipient group who acts as an advocate or opinion leader for the mass population (or a community) and as such is the intermediate recipient in the communication process; this group facilitates communication through discussion with the members of the community. These opinion leaders are not officially chosen or appointed as leaders and it is therefore difficult to distinguish them from other group members. Theirs is an informal role taken in interpersonal communication. Through opinion leaders, groups become the key to mass communication influence, 'providing direction to individuals in terms of opinions, attitudes, values, and norms' (Littlejohn, 1992:351). This fact has great value for health promotion; if the leaders can be reached and convinced to change behaviour, they could further promote health in their communities – even if only by setting an example.

In distant communities in South Africa, for example, unofficial leaders have been identified by the health authorities and are now being trained and empowered as peer educators in their respective communities (Goosen & Klugman, 1996:489). The same principle is used in HIV/AIDS campaigns at the workplace, where peers are trained to become educators for the group.

In any communication, the credibility of the source, whether of the originator or the opinion leader, is an important determinant of successful communication. Recipients make judgements about sources that can have an important impact on the success of communication. 'Credibility rests upon the perception of an audience, that is, a source is only credible if receivers believe it to be so' (Burgoon *et al.*, 1994:67). Recipients make five decisions regarding the credibility of a source.

These dimensions of credibility are:

- competence, that is the source's perceived knowledge of the subject;
- character, that is the apparent trustworthiness of the source;
- composure, or the extent to which the communicator tends to be in control in situations that produce stress;
- sociability, that is the degree to which the source seems likeable and friendly; and
- extroversion, that is indicating if the source has an outgoing personality (Burgoon *et al.*, 1994:67–68).

The degree of homogeneousness also plays a role in effective communication. In some instances where the objective of communication is to persuade or inform, a greater degree of dissimilarity is tolerated (Bredenkamp, 1996:9–10). In social relationships, people who are similar tend to spend more time communicating. To overcome problems associated with dissimilarity, the frequency of communication should be increased, empathy should be developed and close attention should be given to feedback (Burgoon *et al.*, 1994:68). This fact must be taken into consideration where the participants have different levels of knowledge and power, for example, in the relationship between a health care professional and a client.

Power is an important variable influencing the success of communication. A source may be perceived to have at least one of five different types of power:

- Reward power, or the ability of the source to apply positive sanctions;
- coercive power, or the ability to deliver negative sanctions;
- referent power, or the ability to appeal to a recipient's wish to please or be like the source;
- expert power, or when the recipient believes that the source has superior knowledge on a topic because of the source's reputation; or
- legitimate power, or where the internalised values of the recipient affirm the source's right to exert control over the situation (Burgoon *et al.*, 1994:68–69).

In addition to the above, a recipient's perception of a source's power will influence the outcome of communication. The recipient will decide if the source has the ability to apply sanctions (perceived power), if the source really cares whether the request/appeal is complied with or not (perceived concern) and if the source has the ability to determine if the request has been fulfilled or not (perceived scrutiny) (Burgoon *et al.*, 1994:69).

In mass communication, a third participant is often involved in communication, namely the so-called gatekeeper. The gatekeeper could be a publisher, journalist, editor, representative, etc., who receives messages from a source. The gatekeeper filters the information and then creates his or her own message, which is then transmitted to a recipient(s). Recipients do not get their information directly from a source, but rather from the gatekeeper who selects and interprets the information from many sources (Burgoon *et al.*, 1994:29; Littlejohn, 1992:350).

#### 4.2.2 Communication objectives

Once the target audience has been selected and their salient characteristics, predispositions, perceptions, etc. identified, it is necessary to clearly identify the specific communication objectives.

The functions of communication are broadly described as surveillance (news or knowing what is going on), correlation (having options or solutions for dealing with societal problems), cultural transmission (socialisation and education) and entertainment (Littlejohn, 1992:353).

Within these broad categories, communication might want to elicit cognitive, affective or behavioural changes from the recipient(s) (Kotler, 1991:573). For example, through communication a managed health care organisation might want to create awareness of the health risks involved in promiscuous sexual practices – a cognitive response. A community might be enlightened about their rights as health consumers, which could lead to feelings of power – an affective response. By communicating the influence of high salt intake on hypertension, a community might be persuaded to decrease the quantity of salt in their diet – a behavioural response.

Whereas any of the above changes can be objectives in themselves, recipients usually have to pass through the first stage before the second, and only then the third can be reached. In other words, a recipient will receive information to make him or her aware of a problem or situation, a

feeling towards the problem will have to be evoked and only then will a change in behaviour be possible. In health promotion, behavioural change is sought to improve health and well-being.

For communication to be labelled successful, it has to reach its objective. Therefore, the objective will be the departing point in determining the design of the message.

#### 4.2.3 Designing the message

Messages are generated and constructed to accomplish the various goals and intentions of communication. Designing includes speaking and writing, nonverbal coding and language, and the mental processes used to translate ideas into concrete form. Message production is the result of a planned process of stepwise dissemination of information or an endeavour based on the source's assessment of a situation and the needs of the target audience. The development of a message takes place within a particular social milieu (Littlejohn, 1992:379–380).

Message design can be divided into message content (what is said), message structure (composition and organisation) and message format (the symbols used to convey the message).

Message content (that is the information contained in the message) could make an appeal to an audience's reason (logical argument), emotions (emotional argument) and/or morals (credibility). The first two can be combined in any given message. They can also be conceived differently by the recipient than was intended by the source. Various theories exist to explain how communication can effect response. Where behavioural change is sought, most theories explain that the closer the message is to an existing attitude, the more readily the new attitude will be accepted, with changed behaviour as the result (Burgoon *et al.*, 1994:215–216, 226).

Persuasive communication is the method most used for affecting behavioural changes to reach the ideals of health promotion. 'A persuasive message may lead to changes in a person's attitude (beliefs, opinions, and values), which, in turn, may lead to changes in a person's perceptions, emotions, cognition, or overt action' (Burgoon *et al.*, 1994:214). Opinions are favourable, unfavourable, or neutral evaluations of a person, thing, or idea; beliefs are non-evaluative convictions about the truth or falsity of something; and values are deeply held opinions that influence a person's thinking or behaviour.

In a persuasive message, the source states an idea or course of action and suggests reasons why recipients should agree with it. According to the Toulmin model (Burgoon *et al.*, 1994:221), the most persuasive messages are made up of a claim, warrant and data, where the claim is any statement (implied or explicit) that a communicator wants his or her audience to accept or agree to, the warrant is a bridging statement or general belief or attitude stated in support of a claim that allows the data to be linked to the claim, and data are information in the form of specific beliefs stated in support of a claim (evidence). To persuade, the communicator must support each claim with a warrant and data.

Example:

Claim: All cigarette advertising should be banned.

Warrant: Cigarette smoking causes cancer.

Data: Cigarette advertising encourages smoking.

In structuring a message, attention is given to the organisation of the elements of a message in its linguistic sense, that is, sounds, letters or other symbols building into phrases, then sentences, discourse, etc., and its semantic sense to facilitate meaningful communication. However, structuring a message involves more: it is the building of a logical, coherent and persuasive argument, discourse or series of meanings that would elicit the desired response. The source or gatekeeper will have to decide, for example, how much explanation will be needed (given a particular target audience), whether two-sided arguments are needed, what the order of presentation should be (e.g. strongest arguments first or last), how much information can and should be supplied, and if an inductive or deductive approach should be followed. The structure may affect comprehension, attitude and behaviour, and it may persuade. The implication of message structure on human relations and actions and its impact on individuals are relevant considerations because they may differ from person to person (Kotler, 1991:577–578; Littlejohn, 1992:381).

Message format plays an important role, especially in modern communication media. Sound (rhythm, pitch, articulation and speech rate), video and animation (clarity and sound quality), visual communication elements (colour, letter size, page size and layout) and body language in personal communication, and the appropriateness of all of these for a particular audience, may influence the success of communication.

Verbal and non-verbal communications complement one another. 'Nonverbal messages always surround and influence the verbal messages people send, because the medium used for sending verbal messages is always nonverbal (as in vocal or visual cues)' (Rensburg, 1996:218). In verbal communication, an arbitrary symbol system is used to name phenomena (symbolic form of communication). Symbolic communication is mainly used for communicating data-oriented, technical messages.

Verbal communication consists of spoken and written messages. Spoken communication is personal and dynamic, but also transitory and open to misinterpretation and negligence. Feedback becomes an important component of this type of communication. Written communication, in contrast, conveys messages of permanence, stability and formality. The recipient can determine the pace of decoding. Difficult sections can be reviewed and contemplated at ease (Rensburg, 1996:219).

In non-verbal communication, a message describes the actual phenomenon it is communicating (representational form of communication), for example, facial expression of feelings and emotions, posture, gesture, or vocal cue. Representational communication is used to communicate emotionally oriented messages (Kreps & Thornton, 1992:27; Rensburg, 1996:218).

Even though the source may take every precaution in designing and encoding a message that accurately and clearly reflects the intended meaning, the success of the communication and the learning of new behaviour is not guaranteed because learning occurs through a social process of enquiry (exploration) that includes the creation, negotiation and trying out of the meaning of the message. Various viewpoints (e.g. structuralist, interactionist and cognitive) exist regarding the decoding of a message to extract the meaning, but it is generally agreed that the recipient awards meaning within his or her social, psychological and intellectual background, denoting meaning to words of shared knowledge and ascribing personal meaning to others (connotation). Littlejohn's (1992:381) opinion is that meaning is an outcome of the 'interplay between the structure of the message, the use of the message in actual situated interaction, and the mental process necessary to manage information and make interpretation'. People select and prioritise, and therefore give meaning to messages on the grounds of past experiences and predispositions (Kreps & Thornton, 1992:22–23).

The messages people send not only have content, they also define relationships. With each message the source and recipient establish a certain relationship with one another through the feelings that are expressed in the communication. Respect or disrespect, like or dislike, powerfulness or powerlessness, love or hate, comfort or discomfort are examples of the relationship elements conveyed by messages. Personal communication contains the most relational messages (Kreps & Thornton, 1992:23–25).

According to Fuller (1996:12), the design should therefore provide 'a medium that supports communicative practices which enable meanings to be shared'.

#### 4.2.4 Selecting the appropriate communication medium

Human-to-human communication is fraught with problems and any appropriate method or medium that could advance communication should be utilised. But, audiences are selective in the media and information they choose to use. Audiences choose media, and their content, on the grounds of their own particular needs and goals. Furthermore, audiences, especially mass audiences, are not easily persuaded by media alone (Littlejohn, 1992:352, 363).

Two broadly defined channels of communication are available: personal and non-personal. In personal communication, two or more persons are involved who communicate directly to one another. Their encounter may be face-to-face, person to audience, over the telephone and, during the past decade, also via e-mail. The greatest advantage of personal communication is that messages can be individualised and feedback can be immediate. Until about the 1940s, this was the channel employed to communicate health matters.

Non-personal communication takes place without personal contact or interaction. Examples are media (e.g. newspapers, magazines, television and websites), events (e.g. exhibitions and conferences) and atmospheres (e.g. that of a hospital foyer, a concert hall or a museum) (Kotler, 1991:579–580). The communicator should choose the most appropriate channel to reach the objective of the communication.

According to Perse and Courtright (1993:485–487), audiences select the mass or interpersonal channels that they believe will provide the gratifications they seek. Communication channels differ regarding their characteristic content, modes of transmission, modes of reception, ease of use and patterns of use, as well as the needs that they are typically perceived to meet, for example,

personal needs or information needs. In their study, Perse and Courtright (1993) found that individuals choose media idiosyncratically and according to specific needs in specific contexts. However, they also found that the various communication channels possess 'normative images', that is, widely shared perceptions about a medium's typical usage, which are based on the functions that they serve. These perceptions may differ from one community to another and may be influenced by a particular societal structure and media system. Unfortunately, the study was conducted before digital media became widely accepted as communication tools.

#### 4.2.5 Measuring the results

If successful communication is the transfer of specific ideas existing in the mind of a speaker (source) to the mind of an interpreter (recipient) (see 4.2), then ideally a mechanism to measure this transfer should be in place. Such a mechanism can be found in feedback. Feedback is the response of the recipient to the communication message of the source. On the one hand, feedback may indicate that the objective of the communication has been reached, which would conclude the specific communication effort, except for future reinforcement. On the other hand, feedback may indicate that an adjustment of the message or the channel is needed to reach the objective, or even that a re-thinking of the objective is required to align with the needs of the target audience.

Feedback may consist of body language, spoken and/or written language and symbols, and behaviour (whether positive, negative or neutral). 'It serves as the link between the interactants, giving communication a spontaneous and transactional nature. Feedback enables the source to judge the impact of a message and to adjust the message to meet the needs of the receiver or audience' (Burgoon *et al.*, 1994:96–97).

The effectiveness of communication usually increases as the quantity of feedback increases. Face-to-face and small-group situations readily lend themselves to feedback, while feedback is usually minimal or delayed in public or mass communication settings, such as newspaper reports and television appearances. 'In mass communication, feedback may flow in three directions: from the receiver to the gatekeeper, from the receiver to the mass media source, and from the opinion leader to the mass media source' (Burgoon, *et al.*, 1994:30). Digital channels, however, make ample provision for feedback (see 4.3).

### **4.3 Digital communication**

The new communication media are characterised by increased user control, more specialised content, speed of transmission, and non-linear access. Although research on these media (as the media themselves) is still in its infancy, an increasing number of studies focus on the unique attributes of digital media that may add value to the communication process.

The linear communication model of Shannon and Weaver, first published in 1949, is singularly applicable to the digital communication process. According to this model, the source is responsible for formulating or selecting a message. The sender is the instrument or transmitter (in modern terms, the computer) that converts or encodes the message into a set of transportable (digital) signals that are sent over a channel to a recipient. The channel is the link between the source and the recipient or the means by which signs and signals are transmitted. The channel can be cyberspace, satellites, cables, tubes and water. The signs carry or transport the message, while the signals consist of the converted or encoded message. The recipient converts (decodes) the signals back into a message (Fouconnier, 1985:42–51; Littlejohn, 1992:52). For example, in a health care environment utilising digital media, the health management organisation is the source of the message. The message is converted to digital data, that is a computer file, that are transmitted via cyberspace to the member, patient or other end-user by means of a computer. The user's computer converts the digital sign back into a visual and/or audible file. December (1997:1) gives the following definition of communication with a computer: 'Computer-mediated communication is a process of human communication via computer, involving people, situated in particular contexts, engaging in processes to shape media for a variety of purposes.'

Digital communication can be seen as a process taking place when a human interacts with a computer (the human computer conversation paradigm) or when the user interacts directly with the environment by using the computer as a tool (the direct manipulation paradigm). However, the computer can also be viewed 'as a medium for conversation between users, rather than as a dialogue partner with the user' – a shift 'from object of action to medium for communicating action and intent' (Fuller, 1996:11). Balint (1996:29) sees the computer as an 'intermediary' between human and human. The intermediary adds value to the exchange of information if it does 'not only transmit the formulated messages, but also the mental models of individuals [useful for decoding/encoding of messages] involved in the human-to-human communication' (Balint, 1996:32). This new relationship increases reliability, formal correctness and exactness because computer processing can filter, adjust and correct messages and store facts deduced from the

messages. It increases convenience and efficiency of cooperation between all the parties involved.

Apart from the role of the computer as a tool for enhancing processes already taking place, such as performing calculations, processing data and manipulating symbols, it is also an information technology and a medium of human communication. The information technologies have led to a completely new communication environment in which any form of human-computer-human interaction can be seen as a form of communication. Almost every sector of human activity, including communication, has been revolutionised by the convergence of the computer with the telephone (voice) and television (video). The expectation is that one day sources and recipients will be able to send text, voice, images, gestures, facial expressions, virtual objects and cybernetic architectures effortlessly via digital media such as CD-ROMs, the Internet and DVD (Strate, Jacobson & Gibson, 1996:5–8).

The new communication environment (cyber space) is already evolving into a unique culture associated with computer-mediated communication – a culture with its own forms of language and symbols, vocabulary, rituals, conventions, norms, rules of conduct and phenomena, including flaming (hostile communication), spamming (too long or verbose messages) and less offensive forms of ranting. Indications are that our present society is fast moving in the direction of a global electronic village or society (Strate *et al.*, 1996:12).

However, the current extent and nature of digital media's influence on successful communication are still unknown, mainly because of insufficient research to date.

#### 4.3.1 Participants in digital communication

As stated above (see 4.1), communication can be characterised by describing the participants or the number of participants in the process of communication. Many researchers, including Strate *et al.* (1996) and Gumpert and Drucker (1996), see the electronic environment as a society in which social ties and relationships are formed and social interaction of both a private and a public nature takes place. As in physical society, intra-personal, interpersonal (e.g. e-mail), group (e.g. newsgroups and teleconferencing) and mass media (e.g. Website) communication takes place.

Digital media have for many people supplanted the traditional distance interpersonal communication of the postal service, telephones and fax machines with almost instantaneous

communication (Jones, 1995:1). According to Jones (1995:4), e-mail is the most utilised feature of the Internet.

Through the use of computing for communication, a 'personal cyberspace' is generated in which intrapersonal communication can take place. Owing to the anonymity of many cyberspace communications, participants are able to create many 'selves' if they wish. According to Strate and Jacobson (1996:13), 'through this extension of our nervous systems we become members of a global village, [in which] we replace individual identity with role playing, and [where] our forms of perception and our sense of our own bodies are altered'. On the one hand, therefore, individuality may be lost in digital communication but on the other hand individuality may be expanded. Although such behaviour could be to the detriment of reliable information transfer, it nevertheless can create a safe environment and loss of self-consciousness for end-users (Hoffman & Novak, 1996:57), which is conducive to open-hearted, truthful communication. Cyber personality could influence both intrapersonal and interpersonal communication. 'Those who might be more inhibited in direct daily intercourse readily speak out on-line', Aycock (1995:187) found. This is confirmed by Reid (1995:173), who found that 'people in computer-mediated groups were more uninhibited than they were in face-to-face groups'. Gumpert and Drucker (1996:30) are also of the opinion that 'safety seems to be the primary defining criterion by which individuals choose the spaces in which they work, play, live and interact'. They compare the 'hostile world of the street' with the 'more secure, non-threatening, electronic Internet highway of cyberspace'.

An interesting aspect regarding users' experience of electronic communication has been observed by researchers such as Gumpert and Drucker (1996) and Beniger (1996), namely that although electronic communication is in essence mass communication, the end user mainly experiences the communication as personal, indicating that the sharp division between people's public and private places is fading.

The following excerpts from a recent article, 'Duped on the Internet', give insight into the personal nature of electronic communication (Sorour-Morris, 1998: 68–73):

'It gives me a chance ... to share the load.'

'I feel close to them, and I'm interested in what's going on in their lives.'

'They rallied round, giving advice and support.'

'Erin bonded strongly with other mothers who'd given birth at the same time.'

'They offered to lend her their wedding dresses so that she could marry him in style, they offered her money.'

'One night ... Erin dropped her bombshell. Tay was in hospital, diagnosed with cystic fibrosis. ... The news was grim. [I] froze, horrified. ... I offered her my support and a cyber-hug.'

'I got the chills... I suddenly knew that Tay was going to die. I was devastated.'

'Tears streamed down my face as I logged into one of the chat rooms to talk to other people who knew Erin'.

McLaughlin, Osborne and Smith (1995:91) describe this type of communication as representing 'a significant departure from communications media as traditionally understood, combining as they do aspects of both mass and interpersonal communication'. It provides new opportunities for forming relationships, leading to the creation of a cyber community. This sense of community is enhanced by personalised mass communication made possible by technology. For example, once a user has registered on a site like amazon.com, the user will be greeted by name every time he/she logs onto that site.

Research on newer technologies has emphasised another attribute of communication channels, namely social presence, or perceived personalness, which may contribute to successful communication. Social presence is the feeling perceived by the recipient that the communication exchanges are sociable, warm, personal, sensitive and active. Social presence is, however, linked to channel attributes. Until recently, communication channels that did not convey nonverbal information, such as facial expression, gaze, and posture have been considered as lacking in social presence. However, social presence can be influenced by communication goals. Some communication goals, such as overcoming loneliness or dealing with disease and disability, require higher social presence than, for instance gaining information (Perse & Courtright, 1993:488–490). From the above excerpts it seems that the newer media, especially newsgroups, have overcome this drawback.

Digital group communication originated from the early Arpanet days when information needed to be shared among a number of users, thus leading to the creation of mailing lists and later bulletin boards and newsgroups (e.g. Usenet) (Jones, 1995:4). Groups participating in cyber communication may be either all simultaneously on-line (synchronistic communication) and respond to one another immediately, or not (asynchronistic communication) (Baym, 1995:143).

The success of group communication is influenced by external contexts (e.g. the language and culture of participants), the temporal structure (synchronistic or asynchronistic), system infrastructure (e.g. physical configuration, system adaptability and level of friendliness), the group purpose (e.g. support for disease sufferers) and participant characteristics (e.g. group size, composition and individual degrees of training and skill in using the medium) (Baym, 1995:141–149).

Digital communication is, however, essentially mass communication. 'Mass communication involves the dissemination of information and influence in society through media and interpersonal channels. It is an integral part of culture and is inseparable from other large-scale social institutions. Media forms... – as well as media content – affect our ways of thinking and seeing the world' (Littlejohn, 1992:369). Mass communication by electronic media consists of one-to-many or many-to-many communication. As in traditional mass media, interpersonal and group communication also plays a role in the mass communication process (Littlejohn, 1992:372).

Beniger (1996:53) believes that the influencing and control of large populations (masses) are dependent on a large databank of prior knowledge, the capability to compare current behaviour to the desired one and to respond accordingly through many iterations. This is facilitated by mass communication through digital media.

#### 4.3.2 Cyber community

In digital communication, participants firstly interact with other people and secondly with the medium. As seen above, intimate relationships can be formed that belie the supposed impersonal nature of digital media.

In Wilkins's study (Wilkins, 1991:71) it was found that it took only three months for the participants in digital communication to come to regard themselves as a community and to regard one another as friends, although very little personal information had been made known by the participants. 'Because discourse features of the computer conference were features associated with oral conversation, participants may have experienced the exchanges in the same way they experience face-to-face exchanges – as exchanges within interpersonal relationships. ... Emotionally, the participants may have responded to the dyadic nature of the conversation that resulted as a focus on interpersonal relationships among the participants and as a sign of personal intimacy' (Wilkins, 1991:72). It is important to note that the participants in this study did not engage in the

conversation with the explicit or primary purpose of establishing and maintaining personal relationships (Wilkins, 1991:74).

The social nature of cyber communication and cyber community developed gradually, although 'the notion of community has been at the heart of the Internet since its inception. ... In essence, scientists formed interactive research communities that existed not on a physical campus but on the Internet' (Armstrong & Hagel, 1996:134). In the course of time, more communities sprung up to serve consumer needs for communication, information and entertainment, with commercial enterprises only now coming to understand and utilise the unique community-building capabilities of digital media (Armstrong & Hagel, 1996:134–135). By providing consumers (recipients) with the ability to interact with one another and with the service provider (source), organisations can build new and deeper relationships with their customers. Armstrong and Hagel (1996:134–135) believe that success in on-line ventures will belong to those organisations that manage to organise electronic communities through which multiple social and commercial needs are met. This reminds of Perse and Courtright's 'gratifications' sought by audiences (see 4.2.4).

A community formed in cyber space should ideally fill four different user needs, namely transaction, interest, fantasy and relationship in order to develop new and strong relationships (Armstrong & Hagel, 1996:136). A visitor to a cyber community of transaction may want to buy, for example, a humidifier but want to consult other community members first. Communities of interest are formed when users interact extensively with one another on specific topics, such as child care. (The level of personal involvement in these communities is higher than in a community of transaction.) In communities of fantasy, users exercise their imagination and may participate in the creation of a fantasy world, for example, SimHealth, a computer game in which participants make health care decisions. Where competition with others is incorporated in these communities, the interaction becomes a main attraction.

Some groups of people may feel a need to come together in communities of relationship. These communities usually focus on certain intense life experiences. Their interaction can lead to the formation of deep personal connections. The Cancer Forum on CompuServe, which provides support for cancer patients and their families, is a prime example. Participants communicate about how they deal with the disease and exchange information on medical research, pain medication, test results, and protocols. Participants may download literature on cancer from the Forum's on-

line library. The primary value of this type of community is that it gives people the opportunity to come together and share personal experiences, similar to the interaction in a physical community.

#### 4.3.3 Literacy and orality in digital communication

In traditionally oral cultures, the dominant forms of expressions are often concrete, image-evoking narrative. 'Although abstract meanings are implicit..., they are not directly expressed in words. Instead they are symbolized by images called to mind by verbal description' (Lippert, 1996:264). In addition, widely accepted terminology may not be translatable into indigenous languages. For example, there is no equivalent for 'immune system' in the indigenous languages of South Africa. In South African HIV/AIDS health education programmes, trainees are taught that the immune system is the body's 'soldiers'

What we have in the world today is a co-existence of the written word alongside orality. The printed word and literacy increasingly have become the domain of an elite, whereas speech and imagery ('secondary orality') is the dominant media of the masses. This is evidenced by the popularity of television, video and film in which images are not symbolised but presented directly. Lippert (1996:264) postulates that the mind has its visualisation done for it by these media but, once the mind has taken possession of an image, that the act of using it to represent the abstract is the same with both speech and film media. It should be remembered, however, that both language and the alphabet are digital symbol systems in which the form of the signifier is purely arbitrary. Whichever symbol is used, the semantic status of the signified is not affected (Lippert, 1996:262–263).

Secondary orality has strong representation in digital media. In fact, Lee (1996:279) refers to e-mail's immediacy (and democratic power) as having its nearest parallel in oral communication, even though e-mail is not an oral medium. It rather consists of mock-oral prose and a mixture of literate and oral codes, such as emoticons, that are meant to put the verbal text in context on the Internet.

In research done by Wilkins (1991:74), it was found that 'although the computer communication ... used a graphic/visual medium, the interactive nature of the exchange and the real-time constraints of writing and reading online contributed to a discourse characterized by text features of oral conversation'. Participants in digital personal communication sit at their computers to 'talk' to one another in accordance with the oral language activities between two conversationists.

Characteristics of these conversations include turn-taking (by making use of direct address); the maintenance of the topic by lexical repetition, synonyms and shared cultural knowledge; paralinguistic features (e.g. 'sigh', 'blink', 'grin'); exaggeration, exclamation, expressive vocabulary and vivid particles to indicate interest and involvement with others; and disfluencies in conversation (hesitations, false starts, afterthoughts) (Wilkins 1991:61–70). 'Thus a conversation by computer presented a traditionally oral activity — interactive discourse — now in graphic form' (Wilkins, 1991:56, 57). In computer conversations, which provide the means for a traditionally oral activity to take place in written form, a shift is seen in the boundaries between spoken and written discourse.

Apart from the oral nature of written digital conversation, the spoken word is claiming more attention than ever before. According to Friedman (1995:77), in the latest CD-ROM games, for example, the traditional on-screen text is replaced with audio dialogue. He predicts that 'the day when a computer game might look indistinguishable from a film' may not be far off.

Voice input (instead of typing messages with a keyboard) for the English language is already generally available at a reasonable price. Software quality varies at this stage, but public demand will probably lead to better products in the near future.

#### 4.3.4 Multimedia in digital communication

As stated in 2 above, an advantage of multimedia for communication is the fact that various senses are involved in the decoding of a message. The retention of at least part of a message seems to be improved if intense sensory stimuli accompany the message (Burgoon *et al.*, 1994:120).

The planning, design and encoding of messages should take advantage of the possibilities offered by multimedia to facilitate successful communication. Multimedia provides interactive access to both static (i.e. text, image and graphics) and dynamic (i.e. audio, video and animation) content (Hoffman & Novak, 1996:53). According to Bolter (1996:106), a typical multimedia application should rely for its rhetorical effect mainly on video and graphics, and then on sound. Words should only be used as captions for graphics or to identify buttons. Text should be used only to communicate that which cannot be pictured easily.

Multimedia has a large contribution to make towards communication in illiterate and/or semiliterate communities, albeit through an intermediary. The multimedia characteristic of digital media is in line with the new orality prevalent in the world today (see 4.3.3) and the demand for graphic presentation of information (see 4.3.5).

#### 4.3.5 Graphic representation in digital media

Multimedia use in CD-ROMs, DVD and the Internet is proof of the integration of audiovisual, verbal and numeric forms of communication to enhance the general accessibility of information to a wide audience (Strate *et al.*, 1996:13). Bolter (1996:106) predicts that the importance of two- and three-dimensional graphics in electronic representation and communication will increase rapidly in the coming years. The digital communication environment (cyber space) is seen as a graphic space in which the role of written text is minimised; in fact, its legitimacy and necessity is being questioned. The main reason for this is that the 'growing cultural importance of graphics technology seems to be undermining the power of prose to convey and convince' (Bolter, 1996:106). The ultimate unmediated or natural communication is believed to be a virtual environment rendered in immersive, three-dimensional graphics. In such an environment, written communication will be superfluous. Already, as there is greater reliance on electronic graphic presentation, written text is being displaced to a great extent or marginalised (Bolter, 1996:106–108).

It can be said that future digital communication will rely to an increasing extent on graphic representation. In 1996 Bolter (1996:107) predicted that e-mail and newsgroups will become more and more graphic as the technology improves. Especially in the field of marketing, this is now the case. For example, companies use e-mail for branding by incorporating their logos and other recognisable brand images into their messages. E-postcards also carry graphical messages, as well as sound and written text.

#### 4.3.6 Hypermedia in digital communication

Hypertext is the non-sequential presentation of information that allows each user the opportunity to choose and link information together along different paths. As a result the outcome of one user's interaction with the hypermedia (a combination of hypertext and multimedia) may be radically different from the next person's. Potentially, a user can freely travel a global network of information to find and access hypermedia content (machine interactivity) or to communicate with others (person interactivity) in order to fill his/her communication needs (Hoffman & Novak, 1996:53).

This non-linear search and retrieval process provides 'essentially unlimited freedom of choice and greater control' for the user, especially if compared to the 'limited navigational options available in traditional media such as television or print' (Hoffman & Novak, 1996:53). In an educational environment, control is relocated from the teacher (or source) to the pupil (or recipient of the information); in a medical situation, control is transferred from the health professional to the client. Exploration, an effective method of learning, is applied because recipients pursue different paths. In summary it can be said that hypertext is 'dramatic, dynamic, holds attention and gives a choice' (Gibson, 1996:253).

#### 4.3.7 Interactivity in digital communication

According to Hoffman and Novak (1996:54), a user perceives two environments when interacting in a computer environment, namely the physical environment in which he or she is present and the environment defined by the hypermedia environment. In the hypermedia environment, interactivity occurs between persons and between a user and the medium. Person-to-person interactivity takes place during teleconferencing and e-mail, and interactivity between a user and a medium when a computer game educates a recipient about, for example, the complexities of the American national health care policy (Phelan, 1996:42). In a digital disease management programme, such as *ISIS (Initiation Sanitaire Informatisee et Scenarisee)* for cardiovascular risk patients (Consoli, Ben Said, Jean, Menard, Plouin & Chatelier, 1996), interactivity between a user and a medium expands to person-to-person interactivity whenever interaction with a health care professional becomes necessary.

The interactive characteristic of electronic digital communication is unprecedented in mass communication and differentiates it from other public electronic media such as television. This unique characteristic can be utilised in the design of new products, message content, feedback and communication strategy. New technologies and conventions inherent in the possibilities of the medium itself should be exploited to the advantage of successful communication (Hoffman & Novak, 1996:65).

Because digital media make provision for interactive participation, learning is enhanced. The interactivity also presents dynamic potential for growth and development and therefore the most successful interactive interfaces are those that do not prevent the user from taking actions and fulfilling tasks personally (Hoffman & Novak, 1996:63, 66).

Through electronic information, a user may perceive him- or herself to have some form of behavioural control, thereby feeling empowered and confident to make sound decisions. Because the hypermedia computer-mediated environment (CME) is, 'first and foremost, an interactive environment, it affords the foundation for consumer control that is impossible in traditional, passive media. Control comes from both consumers' perception of their ability to adjust the CME and their perception of how the CME responds to their input, with consumer adjustment taking the form of network navigation' (Hoffman & Novak, 1996:64). With digital media, the user is an 'active participant in an interactive exercise of multiple feedback loops and highly immediate communication' (Hoffman & Novak, 1996:66). The ultimate interactivity in an electronic medium today is virtual reality (see 4.3.9).

#### 4.3.8 Feedback in electronic communication

Without feedback, it is difficult if not impossible to determine accurately the effectiveness of communication. During a communication event, a person is responding (giving feedback) continuously. This response is mostly on an affective level because people respond with their emotions and feelings. Upon receiving the feedback, the effect of a message can be monitored and responded to in a subsequent message.

In dyadic (between two people) communication, there is immediate feedback from the recipient, but in traditional mass communication feedback is delayed and minimised because of the distance in time and space (Burgoon *et al.*, 1994:13, 14, 29; Hoffman & Novak, 1996:52). This has supported the belief that the role of mass media to effect behavioural change is minimal although mass media may contribute towards the creation of awareness, especially if supplemented with interpersonal and community structures (Rensburg, 1996:225).

Feedback in digital communication is one of its greatest advantages. Owing to the interactive nature and immediacy of communication via electronic media, response mechanisms can be developed and customised for specific users and/or circumstances. Through proper digital feedback mechanisms, for example, uncertainty regarding the power and credibility of sources can be corrected (see 4.2.1). Honest feedback is encouraged by the unselfconscious participation that electronic communication seems to elicit (see 4.3.1). In a network structure, multiple feedback loops can cross-check and validate responses.

In digital communication, feedback is possible through e-mail, the chat rooms of websites, news groups, fill-in-forms, teleconferencing, etc. In addition to cognitive feedback, sound (voice) and video provide opportunity for affective feedback while emoticons, para-linguistic features and other oral language characteristics (see 4.3.3) contribute to affective feedback via the written word.

Evaluation of the digital medium itself is not only possible through feedback but is also critically important to the source of the communication. Feedback data on the system performance are used to guide information dissemination strategies and develop innovative delivery systems (Kreps, 1993a:151).

#### 4.3.9 Design in digital communication

To enable successful communication, Roschelle (1996:16) suggests four design principles:

- An extended engagement with the problematic situation;
- a supportive focus and content;
- communicative action (where on-screen action and visualisations take place); and
- learning by doing, which is brought about by enquiry.

Digital media lend themselves remarkably well to these four design principles. Not only do they provide opportunities for questions and answers, give hyperlinked, multimedia information and virtual worlds in which to practise new-found knowledge, but they can also mediate communication on different levels (e.g. elementary, intermediate and advanced), in different languages and in different cultural settings. Designers of digital media should know and take into account the communication needs of the specific target audience (Wood, 1995:71, 72).

The design displayed in a digital medium contributes to the success of the communication, even though users are usually unaware of the design elements when they interact with the medium and decode the message. However, the attributes of digital media should be kept in mind when communication is designed. 'The nonsequential structure of hypertext documents, for example, requires special flexibility in design where the page is no longer the unit of presentation' (Wood, 1995:74, 75).

Design criteria for digital media that may influence the effectiveness of communication include the following (Wood, 1995:71–76):

The design should

- enliven the content of the document;

- make the information easier to find;
- contribute to the usability of the document;
- increase the readability of the text (font and size; page layout; line length) and illustrations;
- aim at simplicity and consistency in repeated elements such as navigational controls and location of titles; and
- incorporate the basic rules for interacting, for example returning to the entry point in the document, annotation and bookmarks.

To this list can be added that the design should

- contribute to the purpose of the publication; and
- keep the intended target audience in mind.

Of particular importance is the interface. Successful mediated human-to-human communication procedures require human-centred interfaces capable of dealing with human nature and behaviour. According to Balint (1996:31), human-centred interface design is the 'key to exploiting the potential of computers in making human-to-human information exchange efficient and reliable without assuming too much human familiarity with computers.'

To be truly human-centred, Balint (1996:33) recommends that the ideal interface must have

- nearly free-form command input (i.e. no menu-driven or direct manipulation operations);
- nearly free-form natural language input (e.g. no reliance on limited keywords);
- nearly free-form graphical manipulation (i.e. unrestricted editing of graphical constructs and drawings); and
- nearly free-form gestural input for multimedia systems (i.e. no limited gesture sets).

Such an interface must be able to

- recognise most forms of human communication, such as sound or movement;
- understand a wide variety of background cultures (with the use of a semantic analyser) and make provision for a number of educational levels;
- manage error checking and control (plus acknowledgement) of many kinds of transformed or processed messages; and
- take over some human actions in case of the human's inability to continue communication and interaction (Balint, 1996:33).

Human factors that should be considered in designing communication and human-computer interfaces include the following (Patkin, 1996:170, 175):

- Cognitive factors, for example, perception and psycho-physics, attention, motivation, decision-making and judgement, procedural memory and semantic memory;
- instrumental factors, for example, individual, social and organisational communication goals and the relationship with other communication instruments;
- normative factors, for example, the cultural variation in the communication expectation, performance and norms, contextual and environmental factors, and ethical considerations;
- expressive factors, including code usage and message variability, and somatic factors such as anthropometry and biomechanics; and
- visual and auditory aspects.

Although some of these requirements seem idealistic at this stage, major breakthroughs have been made. Interfaces currently available include the graphic user interface (GUI), for example, Windows and Macintosh, the keyboard, mouse and joystick, the hypermediated page, links, telepresence and virtual reality (VR).

'Virtual reality is a computer interface that enables people to participate directly in real-time three-dimensional environments created from computer-generated simulated environments, digitized images of people and objects, or imported video. Most inclusive are full-emersion systems that provide first-person interaction within the computer-generated world via head-mounted stereoscopic displays, gloves, bodysuits, and audio systems, in which computers generate images on goggles with liquid crystal displays, offering the user the sensation of being in a different place' (Patkin, 1996:169). Applications of VR can be found in computer-aided design (CADD), computer education, medicine (biological visualisations and telepresence surgery), manufacturing and business (virtual teleconferencing). In a VR learning environment, the user can hone skills at his or her own pace and can focus on weaknesses (Patkin, 1996:168). Even more than in other interactive multimedia, users participating in responsive VR learning environments, in which they become engaged in full body-mind kinesthetic learning, not only retain more information but also demonstrate a better understanding of the information presented because the human brain processes information better when it is presented through the various senses (sight, sound, and touch) instead of just text and numbers. Users can practise the skills needed for real-life situations without the risks of injury to themselves or equipment damage. 'The attributes of VR that make it potentially useful for education include flexibility in the creation of a virtual world, ability to support

a feeling of presence, the ability of the user to control and interact with objects and characters within the virtual world, and physical feedback from the virtual world' (Patkin, 1996:173).

#### **4.4 Evaluation**

Communication can be seen as a human need that exists among and between people. The need arises as a result of a person's need for information, products and services, but also from the need for affection, interaction, relationships, etc. Through communication, cognitive, affective and behavioural responses can be elicited from recipients. However, the interpretations and uses of communication symbols by participants may differ considerably as a result of their differences in skills, beliefs, attitudes, opinions, perceptions and socio-cultural background. Knowledge of the target audience and feedback are therefore of primary importance for the correct interpretation and validation of communication messages.

The fact that people perceive messages differently makes the outcome of communication aimed at mass audiences unpredictable. Digital communication, which can also communicate on a personalised level to mass audiences, has the potential to fill this gap.

Apart from the participants, the objective of the communication, the message itself and the chosen medium impact on the success of the communication. Yet again, feedback is the primary measure to ensure the success of the communication.

Inherent in digital communication are a number of attributes that may enhance the communication process. These include:

- the existence of a cyber community of people who interact with one another on a personal level;
- immediate feedback for the correction of deviant interpretation of the message, validation of the information, and reinforcement of the message based on the feedback;
- a variety of media (multimedia) that make an impression on more than one of the senses, thereby improving recall, learning and retention on the one hand, and on the other the availability of graphic and verbal messages that may fulfil the needs of the illiterate and semi-literate;
- interactivity to enhance learning through extended engagement, reinforcement, participation and achievement;
- diversity of communication ranging from intrapersonal to mass media;

- synchronistic and asynchronistic methods to suit the needs of various users;
- variety of links (hypermedia) to facilitate different needs regarding level of content, language, quantity of information, cultural diversity, scope of information, etc.; and
- a measure of control over content, frequency of access, level of information, quantity of information, etc. that can be transferred from source to recipient.

No facet of human life is possible without communication. It forms the cornerstone of all human interaction and influences our view of the world, including the way we see and think of our bodies, health, wellness and well-being.

In this chapter, communication *per se* and digital communication have been placed in the spotlight. It has been explained that digital communication has a number of attributes that may enhance health communication.

One of the ways in which communication may be described is according to the milieu in which it takes place, for example education or health. As this research dealt with communication within the ambit of health care, it was necessary to explore communication in health care. Chapter 5 gives insight into this facet.