

Role of Telecommunication in Improving Adherence of Hypertensive Patients

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Abstract

To increase the knowledge of hypertension amongst support staff of Rhodes University, and to improve adherence of hypertensive patients using telecommunication methods. Questionnaire regarding hypertension, adherence and lifestyle was used to collect pre intervention data of 24 hypertensive patients. Medication diaries were administered and an interactive educational intervention was designed to cater to the specific needs of the target group. Simultaneously, the Short Message Service (SMS) intervention was implemented, where each patient received an SMS five minutes prior to the time required to take their medication. A reminder sheet was handed out to patients to remind them what was required in terms of lifestyle changes. At the end of two weeks, medication diaries were collected and questionnaire was used to collect post intervention data. Weight and blood pressure were measured for each patient before and after the educational intervention. It was observed that the awareness and adherence levels of hypertensive patients were low prior to the intervention. The pre-intervention analysis provided an overall measure in the three major fields, knowledge on hypertension, lifestyle and adherence, which then served as guidelines to design the educational intervention. The intervention emphasized lifestyle habits, awareness of hypertension, and underlined importance of adherence. Subsequent to the education and SMS intervention, there was a major difference in the awareness and adherence levels. Patient education and telecommunication methods increased the knowledge and adherence levels of our target group

INTRODUCTION

It has been estimated that there would be approximately 56 million deaths globally, of which 60% would be due to non-communicable diseases.¹ The burden of non-communicable diseases (NCDs) results from cumulative risks and the complex risk factors resulting in NCDs are well known.^{2,3} Hypertension is a common health condition worldwide and continues to be a risk factor for heart attacks, strokes, renal disease and blindness. Hypertension remains under diagnosed due to its "silent killer" status, causing premature death. Of the 56 million estimated deaths, it was estimated that 16 million of the deaths would be due to cardiovascular disease, especially coronary heart disease and stroke.⁴ Stroke has a direct relation to uncontrolled blood pressure and kills more people than communicable diseases such as AIDS.^{5,6} By the year 2025, 1 in 3 adults aged over 20 years, that is approximately 1.56 billion people worldwide are expected to have hypertension. It continues to affect low

And middle income countries more than developed countries, contrary to the popular belief that it is a 'rich man's disease'.⁷ It is estimated that 1 in 4 South Africans between the ages of 15 and 64 years, suffer from hypertension and it continues to remain one of the leading causes of heart attacks, strokes, kidney failure and premature death.⁸ It is also prevalent in the Eastern Cape of South Africa (where Rhodes University is situated) where, 15% urban adults and 12% rural adults are hypertensive. Out of 13.5% adults diagnosed, only 19.6% were found to be taking medication, and only 11% of these adults were adherent.⁹ This provides evidence to the fact that hypertension remains under diagnosed, and even if diagnosed and treated, majority of the patients remain non-adherent. Care giving, decision making, communicating, managing, teaching and lifelong learning are all identified as key roles of pharmacists.¹⁰ Pharmacists are in a key position to apply population specific data, quality improvement strategies, informatics, and research processes, to promote the availability of effective health care and disease prevention services. Pharmacists are required to provide

Their services in response to a dynamic and evolving set of primary local health care needs.¹¹ Health promotion is a process which involves the use of strategies that seek to foster conditions that enable populations to be healthy and to make healthy choices.¹² Health promotion is also an integral part of pharmaceutical care.¹³ The change in roles of pharmacists from a product to patient-focus requires that more attention is placed on advising patients rather than merely dispensing medicines. However, factors such as lack of time, space, finance, training and perceived conflict between the professional and commercial role of pharmacists, hinder the pharmacists' involvement in health promotion.¹⁴ In urban South Africa, the prevalence of hypertension is 33%,¹⁵ hence, it is important to introduce educational interventions to address this problem. This study was specifically designed for low-literate, low-income category hypertensive support staff of Rhodes University to introduce interactive educational interventions.

MATERIAL AND METHODS

Sample Group

The study was approved by the institutional ethics committee. Hypertensive support staffs at Rhodes University were recruited with the help of the Rhodes University Sanatorium nurses. Inclusion criteria required that the study group included participants only with hypertension and were required to have a mobile phone. Though 47 possible participants were identified, due to the requirement of possessing a mobile phone, only 24 could be included in the study.

Each patient was spoken to individually and explained the nature of this study. A consent form was signed by each participant before commencement of the study.

Pilot study

Questionnaire was pilot tested with five participants who were excluded from the actual study due to their co-morbid conditions of hypertension with diabetes. The questionnaire was checked for comprehension by participants and necessary changes were made.

Study

The study group was finalised and each participant was interviewed in order to fill out the questionnaire. Each participant was given a medication diary, which is a self-reported measure to monitor adherence to medication. The questionnaires were analysed to understand the extent to which participants understood the condition (hypertension), adherence and lifestyle changes required by hypertensive patients. Blood pressure and weight was measured for each patient and recorded. Two weeks later, all participants were regrouped, and an interactive

educational intervention, designed specifically for our target group (low literate) was carried out. Non formal adult education strategies were used in initiating discussion and using simple (medical jargon not used) language. The emphasis was placed on the areas where participants' knowledge was lacking. Short Message Services (SMSs) were sent to the patients in the preferred language. The SMSs were sent with the aid of SIMPILL[®], a private company based in Cape Town, South Africa. They allowed us to form an online dispensary, which allowed for us to key in patient's mobile numbers, dosage times and all other necessary information. The SMSs were then sent out for a period of two weeks. The old medication diaries were taken back and were assessed. A new medication diary was handed out to all the patients. An accepted cut-off point for defining proper medical adherence was set as "at least 80%" of all medicines taken in the duration of the study, implying that on a hypothetical 10 day course, medication for at least 8 days is taken without failure.¹⁶ Our study, however, simplified the level of medical adherence as "not less than 83% of patients in the group taking their medication without failure in a day". This means that, in a population of 25, not less than 20 patients should take their medication for them to be considered adherent. Additionally, a fact sheet with all the key changes in lifestyle required to be made to manage hypertension was prepared and handed out to all the participants. After the SMS and the educational intervention, the hypertension questionnaire was used to record post intervention change in knowledge. Blood pressures were re-measured, medication diaries were collected and all the pre and post intervention results were assessed.

RESULTS

The assessment of the hypertension questionnaire was performed to analyze the three major fields, namely, knowledge of the patients about hypertension, lifestyle of the patients, and adherence to anti-hypertensive medication. There was an overall positive impact on knowledge, lifestyle and adherence. An overall increase of 36% in the awareness of hypertension was observed after the post intervention, based on an average of 22 positive post-intervention responses compared to an average of 12 positive pre-intervention responses. The educational intervention proved to be effective, outlining particularly the awareness in patients of the correct blood pressure. A remarkable increase of 13 correct answers (54%) was observed post-intervention in this field. During pre-intervention, only 17 participants were able

To define hypertension in an acceptable manner but in the post intervention, 22 correct answers were obtained. During pre-intervention, only 12 participants felt that pharmacist were in a position to ensure adherence and to monitor patients' progress, whereas 22 felt this (an increase of 50% to 92%) after the intervention. Most patients understood that uncontrolled high blood pressure leads to a stroke but the intervention improved this knowledge by 17%.

The lifestyle-hypertension relationship was examined in a fairly concise manner with questions varying from drinking/smoking habits, to physical fitness via cooking/eating habits as well as traditional features. A very positive response was observed concerning the addition of salt in the diet. The educational intervention put a lot of emphasis on restricting addition of excess salt to food, explaining to the patients why salt is bad for their health and how it affects their health. It is to be noted that during the post-intervention, many patients admitted to have drastically reduced their salt consumption. The evidence is clear in the increase from 8 to 23 positive responses (33% to 96%). The patients were also encouraged to keep fit through regular exercise or walking to work. The patients were open to this idea as can be seen by 8% increase in willingness to exercise. Fried foods were strictly discouraged during the educational intervention and grilling as well as steaming and boiling was promoted as healthy cooking habits. A favourable increase of 21% was noted after the intervention.

Knowledge regarding adherence to medication was assessed. After the intervention, all participants acknowledged that they were able to remember to take their medications. The correct responses for taking the next dose when one dose was missed increased from 14 to 17 after the intervention. An increase from 5 to 20 participants (63%) was observed after intervention as a response to "I continue my medication even if I am well". It can be directly inferred that the SMS reminders and educational intervention resulted in improved adherence as can be observed from Table 1. The medication diary included a space for participants to write the reason, if any, why they failed to take their medicines if it happens so. On day 10, the only patient who did not take her medication admitted to having forgotten her cell phone at home, so, she only saw the SMS when she got back from work in the evening. She also indicated that she did not take the medicines as it was within four hours of her next dose, as directed in the

intervention.

As expected in a short term study, there was no significant decrease of both systolic and diastolic pressure after the intervention. An average of 2 mmHg decrease was noted in only three participants.

DISCUSSION

The use of technology in the medical field appears to be promising in the management and improvement of adherence in chronic therapy. Developing countries have to initiate innovative strategies to handle complex issues in their health care systems. Increase in non-communicable diseases, lack of funds in public sector, low literate and low income patients, weak health care infra structures, lack of access to sufficient health care providers, to mention a few.

A study reports that the use of SMS, as a reminder to a clinical appointment greatly reduced failure to attend by 27% in a gastroenterology clinic.¹⁷ This lines up with the choice of sending a friendly SMS to remind patients of their medication daily. Although the duration of our study was short, adherence as well as, knowledge of self managing hypertension increased significantly. The medication diary, a self reported way of keeping a check on adherence, was effective along with SMS and education intervention. This indicates the benefits of modern technology at the service of people in improving their health and making their lives easy with a daily reminder to take their medicines.

Another study¹⁸ reports that the only limitation in using SMS to remind patients is when patients do not own a mobile phone. This aspect is applicable to our study because we were restricted to recruit only 24 participants as others did not own a mobile phone. When designing studies for low income and low literate category, access of mobile phone restricts use of telecommunication. One way of promoting patient understanding of the condition as well as adherence is by improving the patient-health care provider relationship so as to eliminate any doubts concerning the condition and treatment.¹⁹ In our study, it was apparent that the more time we spent with the participants the more they accepted, trusted and hence shared information freely with us. Also, the personal attention provided to participants during interviews and educational intervention was an impetus in motivating them to understand and manage their condition better. It is important to consider the situation in developing countries where there are shortages in the number of doctors, resulting in limited time allocated for patient education. It is imperative that pharmacists emphasise the role of patient education and pharmaceutical care in

South Africa and other developing countries can be used to implement telecommunication to improve patient care. Innovative ways like SMS improves interaction between health care providers and patients resulting in increased convenience and care for patients.^{20,21} One of the major limitations of this preliminary study is non-availability of bigger sample size to carry out educational interventions. In a small sample size of low-literate, low-income hypertensive support staff in the university, the final number of participants was restricted severely by lack of participant's access to mobile phones. Another limitation is the duration of the study. As a third year undergraduate research project designed for achieving overall development of leadership qualities, team work, developing problem-solving skills and

understanding basic aspects of research, time available for undertaking research is limited. Long term follow-up of participants with more reinforcement of educational intervention is required to achieve reduction in blood pressure as well as weight loss. Future studies in following up hypertensive support staff will be aimed at long term follow-up.

CONCLUSION

The knowledge regarding hypertension, life style changes required to be made by hypertensive patients and adherence required to control the condition was addressed in this study. Telecommunication and patient education proved effective in achieving this aim.

Table 1: Self reported adherence of participants in medication diary

	PRE-INTERVENTION	% ADHERENCE	POST-INTERVENTION	% ADHERENCE
Day 1	19	79%	24	100%
Day 2	21	87%	24	100%
Day 3	21	87%	24	100%
Day 4	16	65%	24	100%
Day 5	19	79%	24	100%
Day 6	20	83%	24	100%
Day 7	23	96%	24	100%
Day 8	16	65%	21	100%
Day 9	17	71%	21	100%
Day 10	19	79%	23	96%
Day 11	21	87%	24	100%
Day 12	15	63%	24	100%
Day 13	18	75%	24	100%
Day 14	19	79%	24	100%

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