

ORIGINAL RESEARCH

Qualitative evaluation of a physical activity-based chronic disease prevention program in a low-income, rural South African setting

CE Draper¹, SM Nematandani², AT Grimsrud¹, M Rudolph², TL Kolbe-Alexander¹, L de Kock²,
EV Lambert¹

¹UCT/MRC Research Unit for Exercise Science and Sports Medicine, Department of
Human Biology, University of Cape Town, Cape Town, South Africa

²Health Promotion Unit, School of Public Health, University of the Witwatersrand,
Johannesburg, South Africa

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Draper CE, Nematandani SM, Grimsrud AT, Rudolph M, Kolbe-Alexander TL, de Kock L, Lambert EV

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ABSTRACT

Introduction: Chronic diseases, an increasing global concern, are prevalent in the low-income communities of South Africa, where rural health systems bear the double burden of infectious and chronic diseases. The Discovery Healthy Lifestyle Programme (DHLP) is a physical activity-based chronic disease prevention program that has been implemented in a low-income, rural setting in South Africa. The DHLP consists of both school- and primary healthcare clinic-based interventions for learners (Healthnutz) and adults (Live it Up), facilitated by teachers, nurses and community volunteers. The aim of this evaluation was to qualitatively assess the process by which the DHLP was implemented, identifying enabling factors and barriers.

Methods: Data were collected in target communities at schools and clinics from semi-structured focus groups of program leaders and members, teachers and community members ($n=45$), situational analyses of the school physical activity environment, informal community observations and informal interviews with program coordinators.

Results: The target communities faced socioeconomic and health inequalities and remained under-resourced and under-served. In spite of these and other challenges, the DHLP was well received by community members and stakeholders. It was valued by



respondents for its health and psychosocial outcomes, evidenced by increased knowledge and awareness of the importance of physical activity and healthy lifestyles, and positively altered perceptions of physical activity. Program implementers believed the Live it Up component was growing, and this suggested the sustainability of the program. There were, however, some concerns about the fidelity of the Healthnutz intervention, due to timetabling difficulties. Despite this, teachers were positive about the program and its value for their learners, staff and school. The community characteristics of being under-resourced and under-served appeared to positively influence DHLP implementation. Local government involvement in the DHLP resulted in greater ownership of the program, which enabled successful implementation.

Conclusions: This study presents a unique opportunity to assess the implementation and sustainability requirements of programs in environments of limited resources, considerable burden of infectious and chronic diseases and extensive socioeconomic challenges. The findings suggest that through enhancement of knowledge, transfer of appropriate skills and the provision of an enabling environment, participation in physical activity can be effectively promoted in a low-income, rural setting. Physical activity interventions that promote the participation and empowerment of rural communities can be feasible and accessible, thereby assisting in addressing the growing burden of chronic diseases in low-income.

Key words: community-based research, health promotion, physical activity, qualitative research.

Introduction

Chronic diseases have become an increasing global concern, and are prevalent in low-income communities in South Africa¹. South African health systems are bearing the double burden of infectious and chronic diseases in low-income, rural communities², and it has been shown that chronic diseases are increasing among older adults³. Physical activity has been associated with the prevention and reduction of such diseases⁴⁻⁵. While in South Africa concern has been expressed regarding high levels of physical inactivity, it has been estimated that 3.3% of the adult burden of disease may be explained by physical inactivity, which was ranked ninth among risk factors for attributable deaths⁶. However, despite the apparent rise in the burden of chronic diseases in South Africa⁷⁻⁹, there are limited data on the role of physical activity in preventing and reducing chronic diseases in these settings¹⁰⁻¹².

School- and community-based physical activity interventions, including those targeting older adults, have been widely reported in the literature. Programs for schools are typically implemented within the existing school infrastructure and include a curriculum, environmental, or

parent component, or a combination of these¹³⁻¹⁸. Programs for older adults also tend to be implemented within existing community infrastructure, and are often peer-led. Evaluations of interventions in older adults have reported not only increases in habitual levels of physical activity¹⁹, but also improvements in blood pressure²⁰, physical function²⁰⁻²², emotional state²³, functional health and wellbeing²¹, and increased satisfaction with body appearance and function¹⁹. There is less information, however, on critical enabling factors or barriers to the implementation of such programs.

In recent years, qualitative methods have been used frequently in both outcome and process evaluations to understand program attributes such as cultural relevance²⁴, feasibility¹⁸, and implementation²⁵⁻²⁷. However, the majority of this qualitative literature is from developed countries, and although a number of the studies were conducted with low-income groups^{24,26}, there remains a gap in literature from low- and middle-income countries, such as South Africa. Furthermore, while a number of studies cited earlier reports on interventions in low-income settings, very few of these were from African settings. There is also a paucity of data from low-income, rural settings because the majority of interventions are implemented in urban areas.



The Discovery Healthy Lifestyle Programme

The Discovery Healthy Lifestyle Programme (DHLP), a corporate social investment project funded by a major national private health insurer, was implemented in 2006. This program was based on the Community Health Intervention Programmes (CHIPs) which have been active in low-income urban communities in the Western Cape region since 1997. The CHIPs are physical activity-based health promotion programs, based on a life-course approach, and form part of the Sports Science Institute of South Africa's (SSISA) Outreach Division. These programs were developed in response to the apparent rise in chronic diseases, relatively low prevalence of health-enhancing physical activity, and the lack of fitness facilities in low-income and previously marginalised communities²⁸. The school-based component of the CHIPs has previously been shown to be effective in an urban setting²⁹.

The village of Mafarana in South Africa's Limpopo Province was selected as one of the pilot settings for the DHLP because most of the province consists of rural communities, making it an effective contrast to the urban settings of the Western Cape. Furthermore, there was an existing collaboration between program funders and the Limpopo Department of Health in the Mopani District, who had already increased efforts to prevent chronic diseases. Two rural communities in this district were selected to participate in the pilot program. One, Mafarana, was the intervention community and the other, Motupa, served as a 'delayed-intervention' community. A brief overview of demographic information for the Limpopo province is provided (Table 1).

The two CHIPs programs that were implemented as part of the DHLP were 'Healthnutz' for children and 'Live it Up' for older adults (>60 years). Although these two CHIPs programs have generally been implemented separately, and not necessarily in the same communities in the Western Cape, for the purposes of the DHLP, the two programs were implemented together. Details of these programs are outlined in the logic model (Fig1).

The DHLP aligns with Pender's health promotion model³¹, a conceptual framework that is used to understand the complex way individuals interact with their interpersonal and physical environments when changing their health behaviour. This model has been used previously in relation to physical activity and chronic diseases³¹.

Aim

The aims of this qualitative evaluation were to: (i) assess the process by which the DHLP was implemented; (ii) assess the acceptability and feasibility of the program; and (iii) gain insight into the enabling factors and barriers to implementation that may have impacted on outcomes of physical activity participation and awareness of the role of physical activity for health. Although the program outcomes were assessed quantitatively (hence the inclusion of a delayed-intervention community), this article focuses on the qualitative evaluation. Systematic monitoring data were not collected for this program, thus limiting information about the fidelity of the intervention. Due to the lack of reliable monitoring data and the paucity of research on evaluation of physical activity interventions in South Africa or other low-income, rural settings, this evaluation was largely exploratory in nature.

Methods

Data were collected through semi-structured focus groups, situational analyses, informal community observations and informal interviews with program coordinators (nurses from the provincial Department of Health in the Mopani district). These data collection methods, which draw on ethnographic approaches, have been recommended for evaluations of community-based programs that aim to encourage community participation³². It was believed that qualitative methods would provide a richer understanding of the contextual factors surrounding the implementation of the program, owing to the exploratory, descriptive and flexible nature of qualitative research that contributes to and expands our understanding of social processes³³.



Table 1: Limpopo demographic information³⁰

Demographic item	
South African population percentage	12%
People per km ²	43 (37 per km ² in South Africa)
Health districts	5
Contribution to South Africa's farming area	33%
Population living in non-urban areas	89%
Population with no schooling	33%
Unemployment rate	26%
Leading natural causes of death (2001)	TB, influenza & pneumonia
HIV prevalence in Mopani district	23% (in 2002; 15.6% in the province)

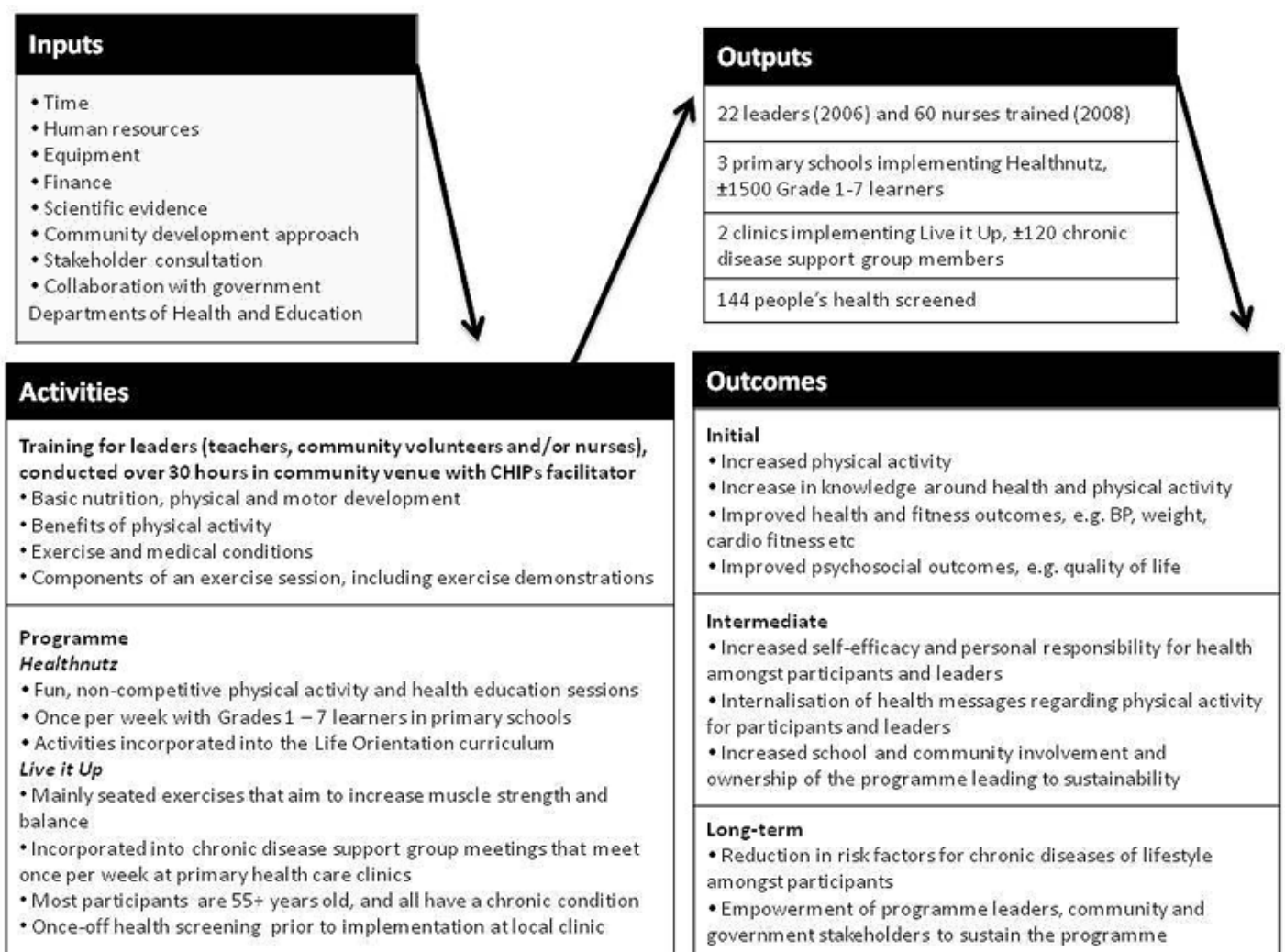


Figure 1: The Discovery Healthy Lifestyle Programme logic model.



Semi-structured focus groups were chosen, rather than in-depth interviews, because the researchers believed a more flexible group process would elicit community views and issues affecting the implementation of the DHLP. The research team acknowledged the unfamiliarity of community members with research, making the naturalistic quality of focus groups³⁴ a less threatening option than one-on-one interviews.

A total of seven visits were made to the community by at least one member of the research team at each visit. Details of these visits are outlined (Table 2). The visits provided a number of valuable opportunities for the researchers to observe the community setting and to speak with program coordinators. While these observations and conversations were not necessarily of the depth required for ethnographic research, they nevertheless played an important part in contextualising the DHLP and providing insight into the implementation process. This was particularly relevant as an essentially urban program was being implemented for the first time in a rural setting.

A total of six focus groups (Table 3) were conducted in the communities (total $n=45$), either at schools or health clinics. Two focus groups ($n=8$, $n=12$) with leaders (of the Healthnutz program) and teachers were conducted during their training, just prior to program implementation; all those undergoing training were invited to participate in the focus groups. One focus group was conducted with teachers from the school in the delayed-intervention community ($n=6$), and this took place at the school. An additional two focus groups were conducted approximately 1 month after implementation: one with Live it Up members ($n=8$) and the other with chronic disease support group members in the delayed-intervention community ($n=8$). For both these focus groups, nurses at the clinics involved in the program invited members of the chronic disease support groups to participate in the focus groups. One focus group ($n=3$) was conducted 4 months after implementation with nurses and a community leader from the intervention

community to assess their impressions of the program's progress in their community.

The purpose of the focus groups in the delayed-intervention community was to gain insight into the issues under investigation, and to determine (qualitatively) the similarities of and differences between the two community settings. The 1 month delay in the initial round of evaluation focus groups was due to logistical and institutional constraints, as well as the fact that program implementation was given priority.

The focus group guide questions covered the following issues:

- the importance of physical activity
- expectations and perceptions of the program/s, and whether any similar programs currently exist in their community
- perceptions of the leader's training
- community factors that may enable or inhibit the successful implementation of the programs.

Focus groups with leaders and teachers were conducted in English, whereas others were conducted in the home language of the participants (Xitsonga or Northern Sotho) by a member of the research team fluent in these languages. Notes of group discussions were taken by trained, local fieldworkers (from both the intervention and delayed-intervention communities) as opposed to recording the discussions by audio or video, because the latter may have inhibited participation. Note-taking was deemed more culturally appropriate by members of the research team after consultation with the program implementers. Notes taken in participants' home language were translated into English; all notes were then collated to generate summaries of the discussions.



Table 2: Details of research visit

Visit	Purpose of visit	Time frame	Research team
1	Fieldworker training, initial focus groups (pre-implementation), situational analyses	May 2006 (3 days)	CD, SN, AG, MR
2	Arrangement of pre-intervention testing (outcome evaluation [†]) with stakeholders	June 2006 (1 day)	CD
3	Pre-intervention testing (outcome evaluation)	July 2006 (5 days)	CD, SN
4	Additional focus groups (initially intended to be pre-implementation)	July /August 2006 (2 days)	SN
5	Post-intervention testing (outcome evaluation)	November 2006 (5 days)	CD, SN
6	Ceremony for feedback to stakeholders	May 2007 (2 days)	CD
7	Ceremony for handover of program from private funder to Limpopo Department of Health	August 2008 (1 day)	CD

[†]Quantitative evaluation.

Table 3: Focus group details

Focus group	N [†]	Participants	Community	Time frame
1	8	Healthnutz leaders, including teachers	Intervention	May 2006: just prior to implementation in intervention community
2	12	Live it Up leaders	Intervention	
3	6	Teachers	Delayed intervention	
4	8	Live it Up members	Intervention	July / August 2006: ±1 month after implementation
5	8	Chronic disease support group members	Delayed intervention	
6	3	Nurses (programme coordinators), 1 program leader	Intervention	November 2006: 4 months after implementation

[†]Total N = 45.

Situational analysis was conducted on the physical activity environment of each school ($n=3$), with specific focus on the implementation of physical activity and sport in the timetable, the availability of sporting equipment and facilities, and the distribution and accessibility of healthy food at the school. This involved a combination of direct observation and consultation with a member of the school staff, such as the school principal or teacher in charge of sport, who also facilitated the observation. These were conducted by a member of the research team using a tool developed for use in South African settings, for 30-45 min duration in each school.

Members of the research team responsible for qualitative data analysis were aware from the outset that the type of data

to be collected may not have had sufficient rigour for qualitative data analysis, such as discourse or conversation analysis. However, owing to the exploratory nature of the evaluation, the team agreed that content (thematic) analysis would be sufficient to uncover the relevant contextual issues impacting on the program's implementation. The focus group summaries were analysed for content by the members of the research team and then validated by informal interviews with program coordinators ($n=3$) and community observations.

The synopses derived from the focus groups, situational analysis, observations and interviews were grouped according to the following framework themes for findings presentation:



- challenges within communities
- perceptions of the importance of physical activity and healthy lifestyles
- views of the DHLP, including the training received by the leaders
- factors perceived to be contributing to or inhibiting the success of the DHLP.

Ethical approval for this research was obtained from the Research Ethics Committee in the Faculty of Health Sciences, University of Cape Town (REC ref: 486/2005). All participants consented to their involvement in the research.

Results

Challenges within communities

A brief description of the socioeconomic characteristics of these communities will help contextualise the circumstances in which the DHLP was implemented. From observations of the community settings, it was evident that these rural communities faced socioeconomic and health inequalities, and were under-resourced and under-served. During the period in which the research took place (2006-2008), a lack of access to basic amenities such as potable water, sanitation and electricity was observed. Although these facilities were available at public health clinics, they were not available at schools or in most homes. A rain water tank served as the only source of potable water at all the schools.

Although participating communities were in close proximity (35-40 km, approximately 30 min drive on roads in reasonably good condition) to the town of Tzaneen (one of Limpopo's largest towns), there was limited access to health services. In 2006, there were reportedly 9600 people to one clinic in the Mopani District³⁵. Health concerns in the community, according to clinic staff and community members (in focus groups), included the prevalence of HIV/AIDS in the district, as well as chronic diseases, with high blood pressure being the primary concern.

Other community challenges emerged in focus group discussions. Public transport, although available, was regarded as unreliable and costly. However, it was often used instead of walking due to the safety concerns of community members (eg the fear of being assaulted or robbed). Transport to and from the clinic was reported to be particularly challenging for older adults who had limited mobility, because many did not live within reasonable walking distance of the clinic.

Further challenges reported in the focus groups by older adults included childminding responsibilities, which were expected of them because many mothers worked away from home. Older adults also experienced financial stress due to poverty, particularly if their minimal government-issued pension (equivalent to approximately US\$130 per month in 2008) was used by other family members who were unemployed. Some respondents also mentioned that they experienced food insecurity (insufficient food, food that was irregularly available or of a poor quality), resulting in poor nutritional status.

Perceptions of the importance of physical activity and healthy lifestyles

At program commencement, leaders and Live it Up members were of the opinion that physical activity was only for younger persons, and that it could be described as 'running and jumping around'. One older adult felt that it would give them 'an opportunity to exercise like white people', suggesting that 'exercise' was typically associated with the more affluent lifestyle 'white people' have historically enjoyed in South Africa.

It was evident in the focus group discussions with leaders and members that their participation in the program provided an opportunity to identify the benefits of physical activity for older adults, such as increased flexibility, strengthening of the bones and joints, reduction in pains, aches and cramps, improved blood circulation, stress reduction, and 'keeping them young'. Many were of the opinion that regular physical activity had decreased in rural areas, and that they were



walking less than in previous years. It was noted that manual labour tasks had decreased due to developments such as increased access to resources (eg purchasing already chopped wood or buying maize meal instead of grinding their own).

Barriers to physical activity and sport in the school environment

Within the school environment, participants expressed the view that children had become less physically active, partly due to the inclusion of physical education in the 'Life Orientation' (LO) curriculum, following its phasing out as a stand-alone subject from 2004 as part of the revised national curriculum. Life Orientation has four learning outcomes: health promotion (including nutrition), social development, personal development, and physical development (including physical activity). Discussions with principals and teachers revealed that as physical activity was only one of the four LO components, it was subsequently allocated less time and attention. As a result teachers required assistance and support to find ways to include physical activity and nutrition education into the LO curriculum.

In addition, during the situational analyses schools were observed to be in great need of sporting equipment, appropriate uniforms and adequately developed facilities. Although large open spaces were available in the school grounds, these were not ideal for physical activity or organised sport because poor surface quality (sandy soil containing stones) increased the risk of injury and was unsuitable for field markings. In the focus group discussions teachers reported that the inadequacy of equipment and facilities severely hindered the implementation and practice of organised sport.

Teachers also mentioned the difficulty of transporting children to compete with other schools, due to large geographical distances; and because many children had no birth certificate they could not be classified into age groups for participation in organised competitions. Such difficulties in participating in organised sport impacted negatively on the

establishment of a culture of physical activity in the school environment.

Views of the Discovery Healthy Lifestyle Programme

The DHLP was believed to be well received in both communities on the basis of the researchers' interactions with community members and stakeholders, continued participation and apparent support of the program (the term 'stakeholders' refers here to political, religious, traditional and tribal community leaders). Many believed that there was a great need for such programs. Despite some initial apprehension due to the novelty of the program in a rural area, respondents were positive about the DHLP and confident about its successful implementation. The perceived value of the program related to both health and psychosocial outcomes.

From a health perspective, focus group participants believed that the information and health education would increase their knowledge about the importance of physical activity and healthy lifestyles. They also believed the program would assist in the reduction of chronic diseases and other adverse health outcomes, as well as improving their own chronic conditions. In terms of psychosocial outcomes, program participants saw the program as providing social interaction, a sense of belonging and unity, and improved quality of life and longevity.

The leaders were positive in the focus groups, and seemingly empowered by the training. This increased their self-efficacy as role models and agents of change. They maintained that the training increased their understanding of physical activity and healthy lifestyles, and their ability to relay the benefits to others in their community. They also believed that the training had positively altered their perception of physical activity, and that future involvement in the program would continue to enhance their knowledge and skills.



Perceptions of the successful implementation of the Discovery Healthy Lifestyle Programme

Initial indicators of successful implementation of the DHLP (specifically the Live it Up program) included the positive change in respondents' perceptions of physical activity, increased awareness of the importance of physical activity and the adoption of healthier lifestyles. These emerged in the focus group conducted with Live it Up members approximately 1 month after the program was implemented. Further indications of program success were mainly from informal observation and interviews during stakeholder feedback and handover ceremonies (visits 6 and 7). While limited specific data were collected, the information gathered from these visits give some indication of the positive way in which the program was received by stakeholders.

Program implementers perceived the Live it Up program component to be growing, and this was evident at the time of the stakeholder feedback ceremony (6 months after post-intervention testing at visit 6) when Live it Up participants from the delayed-intervention community provided an exercise demonstration. This indicated the program had been implemented in the community as planned, which was considered a sign of program growth, and suggested sustainability. There were, however, some concerns about the Healthnutz intervention because some schools were having difficulty incorporating the program into the school timetable. Nonetheless, teachers were positive about the program and its value for their learners, staff and school.

At the stakeholder feedback ceremony, selected findings from the outcome evaluation were presented, with an emphasis on the progress of the research, and the importance of the research for the program. All stakeholder groups were represented, including the academic institutions involved in the evaluation, program managers (CHIPs and SSISA) and funders (Discovery), program implementers, program participants and leaders, as well as community leaders such as tribal and religious leaders, and members of local government. Representatives from all stakeholder groups expressed satisfaction with the progress of the program, and

community and local government representatives in particular voiced their support and their desire to see the program continue and expand in their district. At the time of visit 6 it was also evident from discussion with program implementers and stakeholders that even the evaluation was seen as value-adding to the program, an encouraging finding for future research in similar rural communities.

Positive sentiments expressed during visit 6 were echoed even more strongly at the seventh visit, at which the ownership of the program was transferred from corporate funders to the Department of Health. Just prior to this event, 60 Department of Health nurses had received training to implement the program in their clinics as part of the wider dissemination to other communities in the district. Representatives from the delayed-intervention community (where the program was implemented after the completion of the research) were also present, which was encouraging to the researchers.

The observations made at the stakeholder feedback and handover ceremonies confirmed that the program is perceived as acceptable and feasible within these communities, in spite of the challenges to implementation. At these events it was apparent that communities (including community members, leaders and local government) had been mobilised by their involvement in the DHLP, which increased the likelihood of its sustainability. This was an important outcome of the original community development approach.

Certain characteristics of these two communities – being under-resourced and under-served rural settings – seemed to have positively influenced the implementation of the DHLP. The paucity of resources and infrastructure meant that little had been done to raise the profile of physical activity prior to implementation of the DHLP. Comments from participants suggested this increased their receptiveness to the DHLP and enabled an increase in their levels of activity despite inadequate resources. The involvement of local government in the formative and implementation program phases, with their existing awareness of the effect of chronic diseases,



paved the way for an extensive and participative consultation process with key stakeholders in the district. Community interaction suggested that the consultation process encouraged greater ownership of and involvement in the program. Both members and leaders were identified as role models in their communities, with the potential to change the social norms associated with physical activity and healthy lifestyles.

Alignment of the Discovery Healthy Lifestyle Programme with the health promotion model

With regard to Pender's health promotion model mentioned previously, Figure 2 outlines the main components of this model and indicates areas of alignment of this model with the DHLP.

Discussion

The findings of this study suggest that through enhancement of knowledge, transfer of appropriate skills and the provision of an enabling environment, participation in physical activity can be effectively promoted, in both children and older adults. This study showed that there is a need for physical activity-based health promotion programs, such as the DHLP, even in rural communities where activity may still form a part of everyday household and work-related activities. The DHLP was feasible and accessible to the targeted rural communities because it made use of existing community strengths and assets, such as existing governmental networks and programs. Furthermore, the program was financially viable because it required minimal, inexpensive equipment for the successful implementation, and utilised existing infrastructure within the healthcare or education sectors.

The lessons learnt from this study highlight that key role players and community leaders should be included and acknowledged because they can influence, mobilise and encourage community members to identify, own and implement interventions. This concept of community participation is a key principle of successful health promotion practice^{24,32}, and has been shown to be vital to successful implementation and sustainability of the DHLP.

The empowerment of communities has been identified as a key function of health promotion³⁶. Within the DHLP, not only were leaders empowered as role models and agents of change in their communities, but also program participants were empowered through the opportunity to take increased responsibility for their health. The consultation process was also empowering for community stakeholders, resulting in a greater sense of ownership and involvement in the program. The empowerment of community members through program participation has been shown to be particularly important in South African settings³⁷.

A further lesson from the present findings is that older adults may have the responsibilities of child minding and providing financially for their families. In this case it meant they had less time for program participation than program planners had envisaged. Consideration also needs to be given to the limited mobility of older adults, particularly if they must travel relatively large distances in rural areas. Therefore, health interventions such as physical activity participation should be associated with regular clinic visits and existing chronic disease support group meetings.

The findings of this study also showed that the intervention investigated had to compete with other pressing health and social issues (such as HIV/AIDS, crime and safety, unemployment, poverty and access to basic amenities such as electricity, water and sanitation) for time, attention, resources and energy. However this should not overshadow the appropriateness of and need for such a program.

Health promoters should be encouraged to include the promotion of physical activity for chronic disease prevention as part of a comprehensive approach to promoting healthy lifestyles in low-income, rural communities. Physical activity as part of health promotion could serve as a vehicle for community development and mobilisation; and Ridde's argument³⁶ that health promotion should address social and health inequalities, has relevance for the DHLP in rural communities where socioeconomic and health inequalities persist.

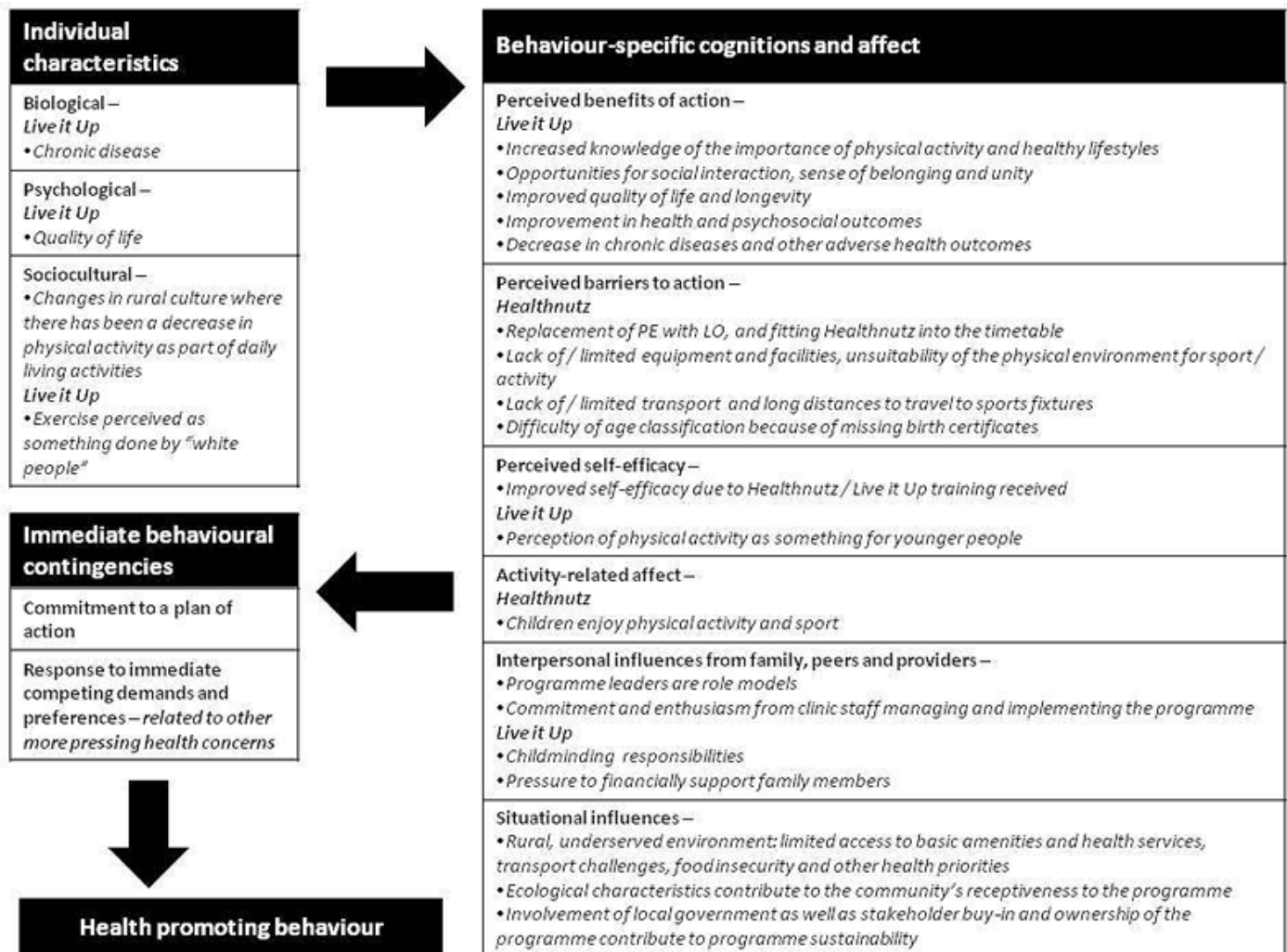


Figure 2: Health promotion model.

In analysing the benefits of a program such as the DHLP, it is important to also focus on benefits other than the physiological, and this was relevant for Live it Up and Healthnutz. For older adults, many of the psychosocial benefits identified by respondents were similar to those reported elsewhere^{19,23}. Within the school environment, the Healthnutz program was believed to be valuable by raising the profile of physical activity and emphasising the importance of healthy lifestyles for teachers and learners, as well as building the capacity of teachers, particularly in the area of LO. The potential impact on other educational and

social outcomes warrants further study, as these could be important to key role players, as well as to school teachers and principals.

Limitations

The limitations of this study include the small sample size and the relatively short period of evaluation. A follow-up study after a number of years would provide more specific insights into and data on the factors promoting or hindering the success of such an activity promotion program. In



addition, the authors acknowledge that there were challenges associated with the rigour of this evaluation. These challenges included the remote, rural setting and the geographical distance from members of the research team, and the pressure to 'implement versus evaluate' that can be experienced in corporately-funded programs. A further challenge was the novelty of this type of research in such rural communities. The resulting unfamiliarity with monitoring and evaluation procedures limited the availability of systematic monitoring data. These challenges highlight the importance of using ethnographic methods in future research that can more accurately capture the community-level data required.

Conclusions

The DHLP was well received by the stakeholders. Although the evaluation was relatively basic, it was perceived by stakeholders to add value to the program. This study presented a unique opportunity to assess the implementation and sustainability requirements of programs in environments with limited resources, a considerable burden of infectious and chronic diseases, and extensive socioeconomic challenges. The evaluation, therefore, contributes to the understanding of implementing and evaluating physical activity-based programs aimed at preventing and treating chronic disease in low-income, rural settings.

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