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Review

The application of the parallel track model in community health promotion: a literature review

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What is known about this topic

- The parallel track model is designed to incorporate community empowerment in a top-down health programme.
- The parallel track model has been applied to various health programmes in at least seven countries.
- There is a lack of a comprehensive review on its application and contribution in a health promotion context.

What this paper adds

- The parallel track model is particularly useful for health programmes that aim to build community capacity and is capable of producing specific types of health outcomes for example, health literacy.
- The parallel track model is less effective in health programmes that focus on health behaviour change in a short time frame.

Abstract

The parallel track model is one of the several models that are used in health promotion programmes that focus on community empowerment. It is unique in that it explicitly incorporates an empowerment approach with a top-down health programme. Since its development in 1999–2000 the model has been used in various health programmes in both developed and developing countries. The aim of this review is to examine the nature and extent of the application of this model and its contribution to promoting health. A review of the literature published between 2000 and 2011 was conducted. Nine results matched the inclusion criteria and revealed that the model has been mostly applied to disadvantaged communities to address health determinants, such as poverty and health literacy. This review found that the model had a positive impact on specific health outcomes such as health literacy and community capacity. We concluded that the parallel track model has the most potential for building capacity for community health promotion and appears to be the least useful for interventions focusing on health behaviour change within a limited time frame.

Keywords: capacity building, community empowerment, evaluation, health outcomes, health promotion, parallel track model

Introduction

Community health promotion is intrinsically linked to health inequity, a key principle of health promotion (World Health Organization 1986, 2000, Laverack 1999, Tones & Green 2004). Moreover, Restrepo (2000) asserts that health and social inequity is unethical and an immoral disparity in our society. It is therefore crucial for health improvement that disadvantaged communities are supported to increase control over their environmental and social determinants of health (World Health Organization 2005). Yet, despite advances in medical technology and improvement in health care services, health inequity continues to be a major challenge in both developed and developing countries (Armstrong *et al.* 2007, Agarwal 2011, Maddison *et al.* 2011).

In addressing health inequity, community empowerment, is one of five action plans for addressing health inequity in health promotion (World Health Organization 1986), and is underpinned by theory and practice (Bernstein *et al.* 1994, Israel *et al.* 1994, Labonte 1994, Hawe *et al.* 1997, Labonte & Laverack 2001, Tengland 2008). As examples of community empowerment knowledge, community empowerment is a multilevel concept, which can be defined in different levels including individual, organisational, and community (Israel

et al. 1994). In practice Labonte (1994) proposed a continuum model of empowerment to illustrate how these different empowerment levels link to one another and how an individual may progress through these levels. In a more recent version of the continuum model comprising five components: (i) personal action, (ii) small groups, (iii) community organisation, (iv) partnership and (v) social and political action, Labonte and Laverack (2008) emphasised the need for health promoters to build community capacity, develop strong community organisational structures and encourage wider community participation. Despite the development of community empowerment concepts, several studies indicate that health promoters still encounter difficulties in incorporating community empowerment into health promotion programmes (Hawe *et al*. 1998, Laverack 1999, Lovell *et al*. 2011). Therefore, the need for a practical planning model that could serve as a guide for health promoters was identified.

The parallel track model developed by Laverack and Labonte (2000) is one of the planning models developed to serve this purpose. Unlike other planning models such as the Beattie's model (Beattie 1991), the PRECEDE-PROCEED model (Green & Kreuter 2005), the logical framework model (Tones & Green 2004) and the Nutbeam's staged model for planning, implementing and evaluating health promotion programmes (Nutbeam 1998b) where health and empowerment are planned separately, the parallel track model is an innovative model that explicitly integrates these two components into one health promotion programme. For example, the Beattie's model (Beattie 1991) provides four approaches to health promotion programmes based on the mode of invention (top-down vs. bottom-up) and the focus of intervention (individual vs. collective). However, the model does not address how empowerment will be integrated into health promotion programmes. Similarly, the PRECEDE-PROCEED model (Green & Kreuter 2005) that provides a thorough process of health programme planning also does not explicitly include empowerment into the model. The parallel track model is a conceptual development that provides comprehensive strategies to achieve both health and empowerment outcomes, and yet, there is still a paucity of evidence that describes its application and effectiveness in community settings.

The main purpose of this literature review is to examine the application of the parallel track model and its contribution to promoting health at the community level. The emergence of the parallel track model is first discussed to provide a more detailed context for the review. Second, the nature and extent of the application of the parallel track model in health promotion programmes are presented. Finally, the outcomes resulting from studies that have used the parallel track model are critically discussed.

Emergence of the parallel track model

In practice, health promoters may face a tension through the conduct of top-down programmes in which goals are usually predetermined while simultaneously trying to incorporate practices of a bottom-up approach (Laverack 2007). The parallel track model was primarily designed to directly addresses this challenge by providing an alternative way to incorporate community empowerment into top-down programmes (Laverack 1999, Laverack & Labonte 2000). Although most community empowerment models attempt to address issues of power exploitation (Laverack & Labonte 2000, Hanks 2006, Yoo *et al*. 2009), some of these models aim to either build community capacity with the view of achieving improvements in health in the long run or to achieve more immediate health outcomes. Instead, the parallel track model explicitly aims to achieve both health and community empowerment outcomes (Laverack & Labonte 2000).

The parallel track model consists of three important components: a strategic framework (see Figure 1), nine operational domains of community empowerment and participatory evaluation methods. Key considerations at each phase are based on two critical questions; Who will be involved? And, how will an empowerment process be integrated? For example, during the design phase health promoters need to identify who has power over programme management and how a programme will support target populations to become empowered within a realistic time frame. By challenging themselves to think thoroughly, health promoters will be able to identify key strategies to support a community to gain control over their health concerns while conducting health programmes.

The main contribution of the parallel track model to community health promotion is in the use of nine operational domains of community empowerment. On the basis of rigorous research methods including literature review, textual analysis and inter-observer agreement, Laverack (1999) initially identified the nine domains: (i) participation, (ii) leadership, (iii) organisational structures, (iv) problem assessment, (v) resource mobilisation, (vi) 'asking why', (vii) links with others, (viii) role of the outside agents and (ix) programme management. These domains are used as a practical guide for health promoters throughout a programme, particularly in strategic planning, implementation and evaluation. For example in the phases of strategic planning and implementation the domains are used to facilitate a community's self-assessment of the areas that need improvement and to strategically plan for improvement in such areas.

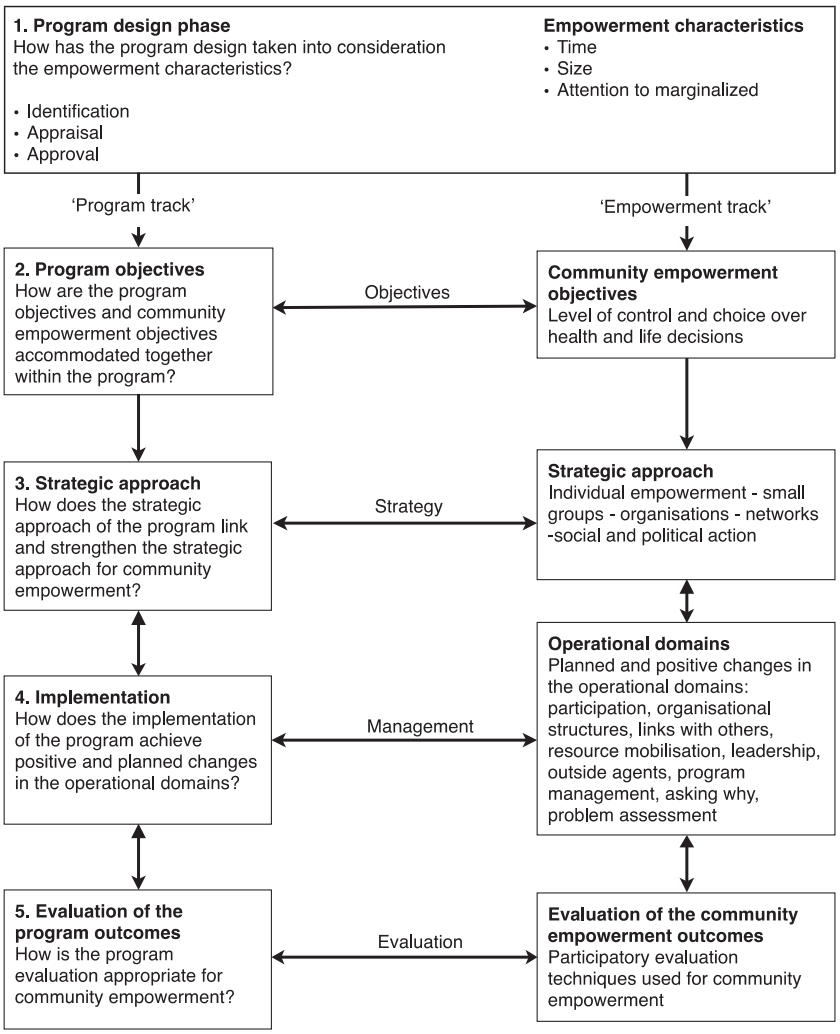

Figure 1 A parallel track model (Laverack & Labonte 2000).

The model also encourages health promoters to use a participatory method to evaluate community empowerment outcomes. However, because community empowerment is typically a lengthy process and evaluation may be required within the limited time frame of a top-down programme, significant empowerment outcomes may be missed. Instead, Labonte and Laverack (2008) suggest that changes in the community empowerment are able to be captured in the form of processes using the nine operational domains. The same assessment method used in strategic planning and implementation can be applied during evaluation so that the results can be compared against the initial assessment. To facilitate community members' understanding of the results, health promoters can use a visual representation such as a spider-web configuration (Bjeras *et al.* 1991). By using both a participatory process and visual representation, the evaluation itself can strengthen the community empowerment process (Labonte & Laverack 2008). These features of the parallel track model informed both the search terms for the literature review and identification of key themes of the published papers. This content was critically examined to answer two main questions raised by this review:

- To what extent has the parallel track model been applied in community health promotion?
- What is the contribution of the parallel track model to promoting health?

Materials and methods

We conducted a narrative review of the parallel track model using several principles of systematic reviewing in order to guide the selection of existing literature, although it was not our intention to conduct a systematic review. A protocol for literature review was developed including research questions, search strategies, inclusion criteria and strategies for data extraction, synthesis and

analysis. The literature review was based on an initial search carried out in PubMed, CINAHL, MedLine, Web of Knowledge and PsychINFO using the following search terms: 'parallel track OR parallel track model' combined with 'community OR communities'. The publication date search was limited to between January 2000 and June 2011 because the parallel track model was first published in 1999 (Laverack). The initial search yielded 48 papers, with only three related to community-based health promotion. Therefore, extended and specific searches were conducted to identify additional literature from the Web of Knowledge that cited Laverack and Labonte (2000) and Labonte *et al.* (2002). These two references were used because they were the original works that proposed and encouraged the use of the parallel track model. This resulted in 48 additional papers of which 23 were related to community-based health promotion. Four textbooks by Laverack and Labonte developing the parallel track models were additionally included in this review because they reported health projects that applied the model. The articles, reports, case studies and any forms of documents were further requested from Laverack and Labonte. Subsequently, two additional papers were identified.

In total, 98 papers and 4 books were identified, of which 28 papers and 4 books were related to community-based health promotion based on detailed examination of titles and abstracts. Full papers then were further examined for the following inclusion criteria:

- health projects were designed based on the parallel track model, and
- studies were reported in English.

The lead researcher (PV) conducted the initial search. Further search was conducted online for papers which did not provide sufficient information regarding study design. In cases where the literature was ambiguous consultation with other team members was carried out to clarify whether a paper met the inclusion criteria. As a result, 21 papers were excluded. Two books were further excluded because their material was reported in the other books. Consequently, seven papers and two books were included in the full review for data extraction and analysis. Figure 2 shows an overview of the literature search.

The quality of the studies was assessed using appropriate critical appraisal tools depending on the types of quantitative and qualitative studies (Campbell *et al.*

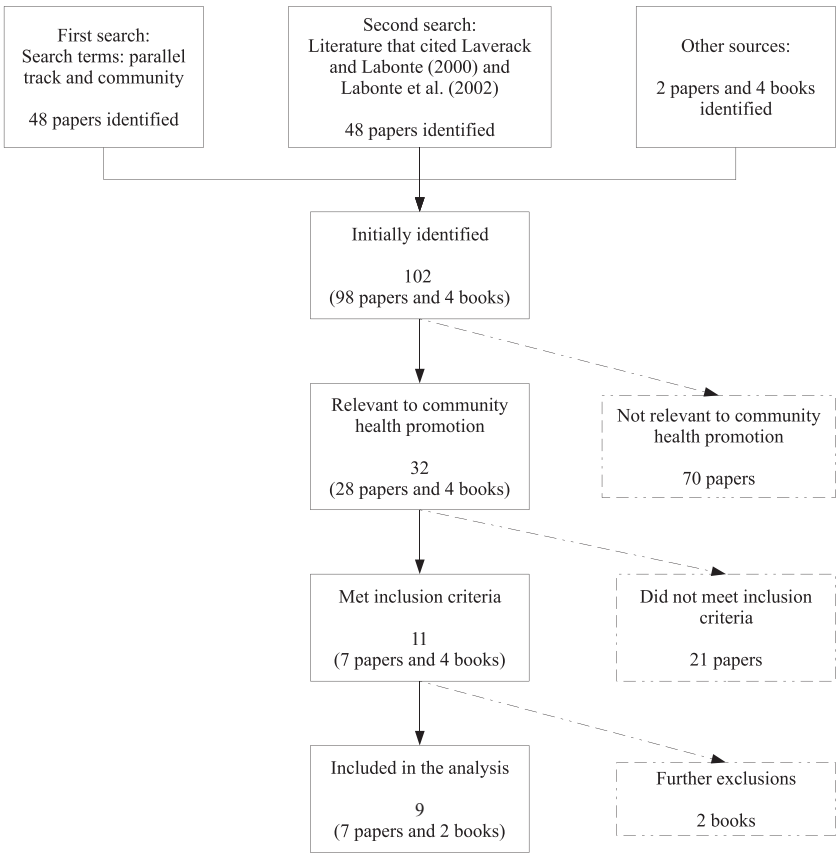

Figure 2 Flow chart of the literature selection process.

2004, Des Jarlais *et al*. 2004, Public Health Resource Unit 2006). The assessment included for example a sample size and validity and reliability of measurement instruments. Studies from the same project were combined prior to data extraction. Specific data were extracted from the literature by PV, including type of studies, aims/objectives, settings/contexts, participants, intervention details, evaluation methods and outcomes/results. Consultation with team members was carried out in relation to several categories to develop consensus about the projects' content. These data were then grouped into five categories: (i) characteristics of targeted communities, (ii) health issues addressed by the model, (iii) project leadership, (iv) evaluation methodology and (v) impact of the model on health and empowerment outcomes. The extracted data among projects within each category were then compared to identify important themes.

Findings

Description of the literature

Of the 102 identified results, nine (two books and seven papers) were fully reviewed. Prior to data extraction the nine results were divided into 10 research projects: three from two books, six from six papers and one from books and paper. Tables 1 and 2 presented the general descriptions of these projects and an overview of the analysis of each project respectively.

With reference to quality assessment of the studies as described, the quality of some studies was not high, whereas the others did not report sufficient information so their quality could not be assessed. However, all studies were included in this review because of the paucity of research on this topic. Six projects in this review were conducted or reported by Laverack (Laverack 2003, 2005, 2007, Laverack & Jones 2003, Laverack & Thangphet 2009) while the remaining four were conducted by other researchers (Fleming *et al*. 2007, Olney *et al*. 2007, Kasmel & Andersen 2011, Lindgren *et al*. 2011). Six projects were published in peer-reviewed journals, three in books and one in books and non-peer-reviewed journals. The projects' evaluation frameworks were based on the following research designs: 1 × randomised group design, 1 × quasi-experimental design, 1 × qualitative design (observation, document analysis, individual and group interviews), and 7 × case studies. The projects were based in nine countries: Kyrgyzstan, Thailand, England, Estonia, Sweden, Canada, Australia, Fiji and United States of America.

Characteristics of the targeted communities

All 10 projects were conducted with disadvantaged groups and communities, including nine projects in rural and remote areas and one project in a city. The projects involved identified communities with populations from low socio-economic and educational backgrounds. For example, Olney *et al*. (2007) chose to conduct a project in Hispanic communities along the Texas-Mexico border due to the fact that some communities in this area encountered the lowest levels of income, educational level and access to health services. Similarly, Fleming *et al*. (2007) developed a project to reduce the risks of chronic disease that was based in a remote community where the unemployment rate was increasing. A similar rationale was not only found in other projects that were conducted in disadvantaged areas but also in a city area where the project targeted at children, youths, inactive adults, employees, older adults and people in ethnic groups having a higher risk of diabetes (Laverack 2007).

The application of the parallel track model in these 10 projects also involved communities of various sizes. For example, a project that aimed to improve the housing standards of an elderly population targeted a small group who lived in a poor area of Leeds, England (Laverack 2007). In contrast, the whole city of Saskatoon, Canada was the target for a project that aimed to increase the physical activity level of people in the city (Laverack 2007).

Health issues addressed by the model

The majority of projects aimed to address health determinants including economic and environmental factors, health literacy, and health behaviour and lifestyle. The targeted communities in the projects in Kyrgyzstan (Laverack & Jones 2003, Laverack 2005, 2007) and Thailand (Laverack & Thangphet 2009) were facing poverty, yet their poverty was alleviated through the efficient management of local resources, such as promoting ecotourism in Thailand. Low housing standards and poor hygiene in household units were identified as priority areas for the health of targeted communities in England (Laverack 2007) and Australia (Laverack 2007) respectively. Similarly, researchers from two universities in America found people in targeted communities had low levels of health literacy and developed the project to increase those levels (Olney *et al*. 2007). The other four projects in Estonia (Kasmel & Andersen 2011), Sweden (Lindgren *et al*. 2011), Canada (Laverack 2007) and Australia (Fleming *et al*. 2007) aimed to improve healthy behaviours and lifestyle such as physical activity in the targeted communities.

The majority of projects applied the parallel track model with the aim of increasing community capacity after priority areas had been identified. For example, participants of the project in England (Laverack 2007) identified the need to improve living conditions of elderly

Table 1 General description of health projects included for analysis in this review

Projects	Author(s)/dates	Objectives	Interventions	Findings	Author(s) main arguments
Improving community capacity regarding local health concerns in Fiji	Laverack (2003)	To identify feasibility and usefulness of the parallel track model	Nine operation domains of community empowerment	A 'kick start' response in the Nasikawa Tikina Health Committee Positive action in the Bemana Tikina Health Committee	Application of the parallel track model is feasible in a Fijian context.
The Sustainable Livelihoods for Livestock Programme in Kyrgyzstan	Laverack and Jones (2003) Laverack (2005, 2007)	To improve the livelihoods communities in Kyrgyzstan	Workshop approach to strengthen the communities	Improvement in some domains of community empowerment	The parallel track model can improve community empowerment in the sustainable livelihoods context.
Community capacity building project in a remote community in Queensland, Australia	Fleming *et al.* (2007)	To build local capacities to reduce risk factors of chronic disease, particularly cardiovascular disease, type 2 diabetes and cancer	Local capacity building through partnership development, 'Think Healthy' grants scheme, and dissemination of health promotion initiatives	No change in risk factors Increase in awareness of local health promotion initiatives 29 local health promotion initiatives were funded	Two-year time frame for change in risk factors of chronic disease is unrealistic.
Improving housing standard in the inner-city area in England	Laverack (2007)	To improve housing standards of the elderly people living in a deprived housing estate in Leeds, England	Workshop approach to strengthen the residents' association	N/A	N/A
Improving health outcomes and community capacity in Canada	Laverack (2007)	To promote physically active lives in Saskatoon	Workshop approach to strengthen the community	Improvement in some domains of community empowerment	A physical activity health promotion programme can be used to improve community capacity.
Improving health and hygiene in a remote community in Northern Australia	Laverack (2007)	To improve housing and hygiene standards	Ottawa charter for health promotion and nine operational domains of community empowerment	N/A	The parallel track model can be applied on a community-based approach
The Colonias project	Olney *et al.* (2007)	To explore the potential of a community-based health information outreach project to overcome health literacy issues in low-income Hispanic communities along the Texas-Mexico border	Train-the-trainer approach	Local residences: Become more informed about a disease, condition, diagnosis, treatment, or healthy behaviour Use MedlinePlus to gain more control over interactions with health care providers Make decisions about treatment options Make lifestyle changes Help a family member or friend Use MedlinePlus to support a job responsibility	Partnering with community health workers can improve health literacy of people in communities.

Table 1 Continued

Projects	Author(s)/dates	Objectives	Interventions	Findings	Author(s) main arguments
Building community capacity for locally managed ecotourism in Northern Thailand	Laverack and Thangphet (2009)	To build community capacity towards locally managed ecotourism	Workshop approach to strengthen the communities	Positive changes in locally managed ecotourism	The parallel track model can improve community empowerment in the locally managed ecotourism context.
Building community capacity in three community initiatives in Estonia	Kasmel and Andersen (2011)	To follow up change in organisational domains of community empowerment (ODCE) in three community initiatives	Empowerment expansion model	Positive change in ODCE in all three community initiatives	The empowerment expansion model is applicable, relevant, simple, and inexpensive tool for community empowerment
Empowerment-based exercise intervention programme in Sweden	Lindgren *et al.* (2011)	To increase participants self-efficacy regarding physical activity	Empowerment-based exercise intervention programme	Statistically significant increase in general self-efficacy, but not in support and social barriers to exercise self-efficacy of participants in intervention groups	Exercise intervention programme has a positive impact on participants' general self-efficacy

people in a deprived housing estate. A health promoter then applied the parallel track model to strengthen community action to achieve identified goals. Similarly, the research project in Saskatoon (Labonte *et al.* 2002) integrated the parallel track model into the project after a physical activity issue had been determined.

Project leadership

The majority of projects had established a structure of having formal committees comprising community representatives, agencies from governmental sectors, and researchers, but had developed differently. For example, the Saskatoon 'In Motion Programme' (Laverack 2007) and hygiene improvement programme in an Aboriginal community in Australia (Laverack 2007) were initiated by governmental sectors whereas others, such as the health literacy improvement programme in Hispanic communities in America (Olney *et al.* 2007), were initiated by academic researchers. Partnerships between academic institutions, government agencies and community organisations were generally established after health issues had been identified. In contrast to these structured committees, both the housing project in England (Laverack 2007) and the sub-project in Estonia (Kasmel & Andersen 2011) were initiated by an elderly population who requested help from an external health promotion practitioner after identifying their goals (Laverack 2007).

Evaluation methodology

Of the 10 projects, eight reported their evaluation methods. Specifically, four evaluated health-related outcomes, three evaluated the community empowerment process, and one assessed the usefulness of the parallel track model. The projects in Thailand (Laverack & Thangphet 2009), Sweden (Lindgren *et al.* 2011), Australia (Fleming *et al.* 2007), and America (Laverack 2007) evaluated health-related outcomes using different methods, largely depending on project designs. For example, the project in Australia that aimed to reduce risk factors of chronic disease used a computer-assisted telephone interview survey to examine the risk factors and awareness of community activities (Fleming *et al.* 2007), whereas the project in America that focused on health literacy used qualitative methods to explore the usefulness of the project and examine any improvement in health literacy (Olney *et al.* 2007).

Regarding an evaluation of empowerment, the project in Kyrgyzstan (Laverack & Jones 2003, Laverack 2005, 2007) and the project in Canada (Laverack 2007) conducted serial assessments to measure community empowerment. The assessments of the projects were based on nine aforementioned capacity domains using workshop approaches: however evaluation methods

Table 2 A brief summary of analysis

Projects	Authors/dates	Targeted communities	Health issues	Project leadership	Evaluation methods
Improving community capacity regarding local health concerns in Fiji	Laverack (2003)	Rural districts in Fiji	N/A	Tikina Health Committees	Follow-up interviews
The Sustainable Livelihoods for Livestock Programme in Kyrgyzstan	Laverack and Jones (2003) Laverack (2005, 2007)	Poverty areas in Kyrgyzstan	Poverty	Resident team of national and international personnel	Workshop approach using empowerment assessment rating scales
Community capacity building project in a remote community in Queensland, Australia	Fleming *et al.* (2007)	A remote community in Queensland, Australia	Risk factors of chronic disease	Local community, public health researchers and practitioners from Queensland universities, the Health Department, and a not-for-profit organisation.	Computer assisted telephone interview survey
Improving housing standard in the inner-city area in England	Laverack (2007)	Poor housing estate in Leeds, England	Poor housing standards	Residents' association, which composes of local elderly people	N/A
Improving health outcomes and community capacity in Canada	Laverack (2007)	Saskatoon, Canada	Physical activity	Representatives from four agencies (Saskatoon District Health, the City of Saskatoon, College of Kinesiology, and ParticipAction)	Workshop approach using empowerment assessment rating scales
Improving health and hygiene in a remote community in Northern Australia	Laverack (2007)	An aboriginal community in Northern Australia	Health and hygiene in households	Community council, community elders, environmental health service	N/A
The Colonias project	Olney *et al.* (2007)	Low-income Hispanic communities along the Texas-Mexico border	Health literacy	The University of Texas Health Science Center at San Antonio Library and the Texas A&M University Center for Housing and Urban Development	Observation Document analysis Individual and group interview
Building community capacity for locally managed ecotourism in Northern Thailand	Laverack and Thangphet (2009)	Two remote communities in Northern Thailand	Poverty	Village leadman, community ecotourism committee, occupational group leaders, and local villagers	Follow-up interviews
Building community capacity in three community initiatives in Estonia	Kasmel and Andersen (2011)	Rapla county, Estonia	Safe community Drug abuse and AIDS prevention Elderly quality of life	Safe community: community members, municipal representatives and decision makers Drug abuse and AIDS prevention: government bodies guided by local organisations Elderly quality of life: a group of elderly women	Workshop approach using modified community capacity index
Empowerment-based exercise intervention programme in Sweden	Lindgren *et al.* (2011)	Low socio-economic areas in two municipalities in Sweden	Physical activity	No explicit description	Pre- and post-test randomised group design

were dissimilar in detail. First, participants in Kyrgyzstan were asked to assess community capacity in a group during the workshops, while participants in Saskatoon were assessed individually after the workshops. Second, the Kyrgyzstan project evaluated community empowerment using a qualitative method, while the Saskatoon project used a quantitative approach. The project in Estonia (Kasmel & Andersen 2011) also conducted community empowerment assessment 1 and 2 years after implementation using the consensus workshop similar to the project in Kyrgyzstan and Canada. However, it used a different measurement tool; organisational domains of community empowerment (ODCE) that was developed based on the Community Capacity Index (Bush *et al.* 2002). Unlike other projects that evaluated health or empowerment outcomes, the project in Fiji conducted individual interviews to examine the usefulness and feasibility of the model (Laverack 2003). Even though the majority of projects reported evaluation methods, none of the projects explicitly reported if they had evaluated *both* community empowerment and health-related outcomes.

Impact of the parallel track model on health and empowerment outcomes

Of the 10 projects, four reported health outcomes. A project in America showed that the project improved health literacy of Hispanic communities in many ways (Olney *et al.* 2007). For example, local people became more informed about a disease, condition, diagnosis, treatment, or healthy behaviours and some used MedlinePlus; an online health information resource, to make decisions about treatment options. However, the findings from the study by Olney *et al.* (2007) should be interpreted with caution because they are mainly based on feedback from community workers rather than the local community members. In addition, a validity check of the analysis was not carried out with participants who provided data for the original analysis. Similarly, positive results were reported in a project in Sweden (Lindgren *et al.* 2011) that found a significant increase in general self-efficacy scores of non-physically active, adolescent girls in the intervention groups compared to control groups. However, this study had a small sample size in both the intervention and control groups with a high rate of participants dropping out of the project (50% in intervention groups vs. 38% in control groups). A project in Thailand also provided positive evidence from the parallel track model (Laverack & Thangphet 2009). Follow-up interviews with participants showed that the parallel track model could bring political changes through collective action in the community, such as permission from local government to utilise public resources. In contrast, a project in Australia found that the intervention did not reduce risk factors of chronic diseases compared to a control community (Fleming *et al.* 2007). However awareness of local health activities in the intervention community increased to nearly 50% compared to 2% in the control community and 29 health promotion activities were locally set up through the intervention's financial support.

The Sustainable Livelihoods for Livestock Programme in Kyrgyzstan (Laverack & Jones 2003, Laverack 2005, 2007), the Saskatoon 'In Motion Programme' (Laverack 2007), and the project in Estonia (Kasmel & Andersen 2011) assessed the level of community empowerment through a workshop approach and showed that the programmes positively impacted community empowerment. A second assessment of community capacity of Kyzil Oi village in Kyrgyzstan after 6 months of the first assessment revealed an improvement in six community empowerment domains, including programme management, 'asking why', participation, organisational structures, leadership and resource mobilisation (Laverack 2005). Similarly, the level of community empowerment in the Saskatoon project increased in every domain (Laverack 2007). The projects in Estonia also found substantial improvement in the ODCE in all three sub-projects. Even though these results were self-assessed and subject to the bias of participants, the model did offer validated procedures to prevent bias. For example, the participants were asked to provide reasons for rating the scales in an initial assessment, which were used as a reference for future assessment.

While these three projects described improvement in community empowerment, the project in Fiji illustrated the feasibility and usefulness of the model in the Fijian context (Laverack 2003). The assessment in two communities showed initial positive changes after the model had been implemented. For example, members of the health committee in one community used a checklist for safety and hygiene developed during the implementation to examine the issues in the community. Laverack (2003) argued that information sharing among stakeholders and follow-up assessments were essential to the success of the implementation. However, findings from this project were generated from only three participants and should also be interpreted cautiously.

Discussion

This review aimed to examine the extent of the application of the parallel track model in the context of community-based health promotion. We found that the parallel track model has been mainly applied to a small, but wide range of community projects and, in some cases, had

resulted in positive changes in both health and community empowerment.

The parallel track model was originally designed for use in top-down health promotion programmes, in which community empowerment is employed (Laverack 1999). Interestingly, this review found that the model was not only applied to top-down projects, where issues were predetermined and the model applied as a strategy to strengthen community action (World Health Organization 1986) but also when projects had a bottom-up approach, where local people identify their own needs as demonstrated in a project in England (Laverack 2007) and two sub-projects in Estonia (Kasmel & Andersen 2011). This review also found that the term 'community empowerment' in the literature was tailored and operationalised to be specific to a context in which the projects were conducted. This context-specific adaptation is an essential element of community empowerment projects (Wallerstein 2006).

The majority of the projects aimed to empower communities to address health determinants, including environment, lifestyle, health literacy and economic status. This primary aim is congruent with a concept of health promotion (World Health Organization 2005). Of the four projects reporting health outcomes, three revealed positive changes in communities, whereas one did not find positive changes in risk factors, but did in the community's awareness of local health activities. However, the outcomes measured in these four projects were different and, therefore, required a different time frame to see evidence of any changes resulting from the projects. For example, the three projects measured changes in perceived self-efficacy (Kasmel & Andersen 2011), health literacy (Olney *et al.* 2007) and community practice (Laverack & Thangphet 2009). According to Nutbeam (1998a), these are immediate outcomes from health promotion activities and require a shorter period of time to see changes. In contrast, the project that aimed to reduce risk factors of chronic diseases evaluated change in health behaviours (Fleming *et al.* 2007) that normally require a longer time frame to see positive changes (Tones & Green 2004). Even though the majority of the projects did not report health outcomes, it seemed that the model has brought positive results to communities within a limited time frame. However, a paucity of evidence makes it difficult to claim a positive impact of the model on health outcomes.

Of four projects focusing on community empowerment, three assessed change in community empowerment using the workshop approach. This review found that the application of the parallel track model on either top-down programmes or a bottom-up approach improved community empowerment of the targeted community. Additionally, even though evaluation of empowerment is difficult in health promotion projects (Wallerstein 2006), this review argues that theory-based measurement tools and a participatory evaluation approach can be used to evaluate and monitor change in empowerment process. The only limitation of these tools however is the inability to compare empowerment outcomes between communities.

The analysis of the application of the parallel track model in this review supports its usefulness and feasibility in community-based health promotion programmes and research in four ways. First, the model can be applied to various sized communities and locations, including urban and rural settings. Second, both top-down and bottom-up programmes can utilise the model to increase community capacity to address identified health issues. Third, the model is compatible with health promotion programmes that normally aim to address health determinants. Fourth, this review reveals the potential of the model to produce a positive impact on both health and community empowerment. However, there is a need for increased comprehensive, valid and reliable evaluation to understand the effectiveness of the model on community-based health promotion programmes.

This review has several limitations. The first limitation, referred to as a 'one-sided reference bias', may lead to reporting more favourable outcomes (Sackett 1979), and is evident in this review. For example, 6 of the 10 projects were self-reported by the model's developers, Laverack and Labonte, which may constitute such bias. Second, few projects assessed the impact of the model-based interventions on health outcomes, and some projects provided insufficient description of the intervention and evaluation methods, which limited our understanding of their effectiveness on health and empowerment outcomes. For example, Fleming *et al.* (2007) did not provide a detailed description of the sampling methods, inclusion and exclusion criteria, analytical methods, sample characteristics and response rate. The lack of detail described in some projects also led to a degree of uncertainty about the reliability of reported outcomes. Finally, even though we deliberately identified as much of the grey literature as possible by, for example, requesting any forms of documents reporting the use of the parallel track model from Laverack and Labonte, some projects might not have been identified and included in this review.

Conclusions

This review describes the application of the parallel track model and its contribution to promoting health. We conclude that the parallel track model has the most potential for health promotion programmes that aim to achieve

both capacity building and positive change in health outcomes, such as health literacy, as well as community practice in a local setting, but appears to be less effective in programmes where health behaviour change is a short-term goal. The model clearly demonstrates potential as an approach to community health promotion, although further evidence is required to more fully understand its effectiveness based on more detailed programme evaluation.

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