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Measuring change in vulnerable adolescents: Findings from a peer education evaluation in South Africa

Sharlene Swartz*, Charles Deutsch, Mokhantšo Makoae, Barbara Michel, James Hamilton Harding, Gabrielle Garzouzie, Amanda Rozani, Toby Runciman, Ingrid Van der Heijden

Abstract

Introduction: In the context of poverty and HIV and AIDS, peer education is thought to be capable of providing vulnerable youth with psychosocial support as well as information and decision-making skills otherwise limited by scarce social and material resources. As a preventative education intervention method, peer education is a strategy aimed at norms and peer group influences that affect health behaviours and attitudes. However, too few evaluations of peer-led programmes are available, and they frequently fail to reflect real differences between those who have been recipients of peer education and those who have not. This article reports on an evaluation of a pilot peer-led intervention, entitled *Vhutshilo*, implemented on principles agreed upon through a collaborative effort in South Africa by the Harvard School of Public Health and the Centre for the Support of Peer Education (the *Rutanang* collaboration). *Vhutshilo* targeted vulnerable adolescents aged 14–16 years living in some of South Africa's under-resourced communities. **Methodology:** The research design was a mixed-method (qualitative and quantitative), longitudinal, quasi-experimental evaluation. Tools used included a quantitative survey questionnaire ($n = 183$) and semi-structured interviews ($n = 32$) with beneficiaries of peer education. Surveys were administered twice for beneficiaries of peer education ($n = 73$), immediately after completion of the programme (post-test) and 4 months later (delayed post-test), and once for control group members ($n = 110$). The three main methodological limitations in this study were the use of a once-off control group assessment as the baseline for comparison, without a pre-test, due to timing and resource constraints; a small sample size ($n = 183$), which reduced the statistical power of the evaluation; and the unavailability of existing tested survey questions to measure the impact of peer education and its role in behaviour change. **Findings:** This article reports on the difficulties of designing a comprehensive evaluation within time and financial constraints, critically evaluates survey design with multi-item indicators, and discusses six statistically significant changes observed in *Vhutshilo* participants out of a 92-point survey. Youth struggling with poor quality education and living in economically fraught contexts with little social support, nonetheless, showed evidence of having greater knowledge of support networks and an expanded emotional repertoire by the end of the *Vhutshilo* programme, and 4 months later. At both individual and group level, many with low socio-economic status showed great improvement with regard to programme indicator scores. **Conclusion:** For the poorest adolescents, especially those living in the rural parts of South Africa, peer education has the potential to change future orientation, attitudes and knowledge regarding HIV and AIDS, including an intolerance for multiple concurrent partnerships. When well organised and properly supported, peer education programmes (and the *Vhutshilo* curriculum, in particular) provide vulnerable youth with opportunities to develop psychosocial skills and informational resources that contribute to the changing of norms, attitudes and behaviours. However, the article also flags the need for effective peer education evaluations that take into account limited financial resources and that possess tested indicators of programme effectiveness.

Keywords: peer education, HIV and AIDS, *Vhutshilo*, *Rutanang*, vulnerable adolescents, evaluation, psychosocial support

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Résumé

Introduction: Dans le contexte de la pauvreté ainsi que du VIH et du sida, on considère que l'éducation par les pairs est en mesure d'apporter à la jeunesse vulnérable un soutien psycho-social et des compétences en matière d'information et de prise de décision, compétences en d'autres cas limitées par des ressources sociales et matérielles rares. Comme méthode d'intervention pour l'éducation préventive, l'éducation par les pairs est une stratégie ciblant les normes et l'influence des groupes de pairs qui affectent les comportements et attitudes liés à la santé. Toutefois, trop peu d'évaluations des programmes menés par les pairs sont disponibles, et elles manquent souvent de refléter les différences réelles entre ceux ayant bénéficié de l'éducation par les pairs et ceux n'en ayant pas bénéficié. Cet article rend compte de l'évaluation d'une intervention pilote dirigée par les pairs, intitulée *Vhutshilo*, mise en œuvre sur des principes convenus grâce à l'initiative commune en Afrique du Sud de l'École de santé publique de Harvard et du Centre de soutien à l'éducation par les pairs (la collaboration *Rutanang*). Le programme *Vhutshilo* a ciblé des adolescents vulnérables âgés de 14 à 16 ans, vivant dans certaines des communautés d'Afrique du Sud en manque de ressources. **Méthodologie:** La recherche est fondée sur une évaluation à méthode mixte (qualitative et quantitative), longitudinale et quasi-expérimentale. Un questionnaire d'enquête quantitative ($n = 183$) et des entretiens semi-directifs ($n = 32$) avec les bénéficiaires de l'éducation par les pairs font partie des outils utilisés. Les enquêtes ont été effectuées deux fois pour les bénéficiaires de l'éducation par les pairs ($n = 73$), immédiatement à l'issue du programme (post-test) et quatre mois plus tard (post-test retardé); et une fois pour les membres du groupe témoin ($n = 110$). Les trois limites méthodologiques principales de cette étude sont: l'utilisation d'une évaluation unique du groupe témoin comme référence de comparaison, sans pré-test, en raison des contraintes de temps et de ressources; un échantillon de petite taille ($n = 183$), ce qui a diminué la valeur statistique de l'évaluation; et l'indisponibilité de questions d'enquête testées existantes pour mesurer l'impact de l'éducation par les pairs et de son rôle dans le changement des comportements. **Résultats:** Cet article rend compte de la difficulté à concevoir une évaluation exhaustive avec des contraintes de temps et de ressources financières; il évalue de manière critique la conception d'enquête avec des indicateurs à éléments multiples; et, il aborde six changements statistiquement significatifs observés auprès des participants de *Vhutshilo* au moyen d'une enquête en 92 points. Les jeunes aux prises avec une éducation de mauvaise qualité et vivant dans un contexte économique tendu avec peu de soutien social ont néanmoins montré une connaissance accrue des réseaux de soutien et un répertoire émotionnel élargi, à la fin du programme *Vhutshilo* et quatre mois plus tard. De nombreux participants vivant en milieu défavorisé ont fait de grands progrès en ce qui concerne les scores des indicateurs du programme, tant à un niveau individuel qu'en groupe. **Conclusion:** Pour les adolescents les plus pauvres, notamment ceux habitant les régions rurales d'Afrique du Sud, l'éducation par les pairs a le pouvoir de changer les orientations, les attitudes et les connaissances futures liées au VIH et au sida, y compris l'intolérance envers les relations avec des partenaires multiples simultanés. Lorsqu'ils sont bien organisés et qu'ils bénéficient du soutien adéquat, les programmes d'éducation par les pairs (*Vhutshilo*, en particulier) apportent à la jeunesse vulnérable la possibilité de développer des compétences psycho-sociales et des ressources informationnelles qui contribuent au changement des normes, des attitudes et des comportements. Toutefois, l'article souligne aussi le besoin d'évaluations efficaces de l'éducation par les pairs qui prennent en compte les ressources financières limitées et qui possèdent des indicateurs testés de l'efficacité de programme.

Mots clés: éducation par les pairs, VIH et sida, *Vhutshilo*, *Rutanang*, adolescents vulnérables, évaluation, soutien psycho-social

Background

In the South African context, the pervasive effect of poverty means that many young people have limited assets with which to develop resilience to environmental threats and risky health and social behaviours. Nattrass (2009) and Dryfoos (1990), in particular, have shown that poverty plays a pivotal role in the HIV epidemic in sub-Saharan countries, and affects vulnerability by driving risk-taking behaviour. Poverty, when combined with the usual social upheavals of adolescence, renders interventions crucial for the youth (Hurrelmann & Richter 2006; Jessor 1998). These interventions need to address social and behavioural factors that impact on adolescents' risk-taking, and should bolster their psychosocial capacities to deal with poverty and vulnerability. These negative social and behavioural factors include alcohol and drug use; participation in and exposure to crime and violence; involvement in transactional sex, unprotected sex, inter-generational sexual relationships and multiple concurrent partnerships (MCPs); high school dropout and subsequent unemployment as a result of teenage pregnancy (Panday, Makiwane,

Ranchod & Letsoalo 2009); and inadequate access to public health facilities by young people.

Furthermore, vulnerable adolescents are placed at great risk of HIV infection as they explore natural sexual curiosity and impulses in conditions where there is a large reservoir of the virus in the population. Their vulnerability is exacerbated by weak protective factors such as the absence of adult caregivers, the presence of cultural taboos and discomfort among adults in talking about sex with youth, and the poor quality of education systems. At the same time, it is clear that adolescents (and their communities) have considerable resilience in coping with adversity. In particular, they are able to bear and recover from significant suffering when they are surrounded by people who love and care for them (Grotberg 1995). Given that less than 10% of vulnerable youth receive services in most provinces of South Africa (Department of Social Development, South Africa 2007), these supportive relationships are central to their well-being.

In South Africa, the school dropout rate increases dramatically after Grade 9. School dropout, in turn, is highly correlated to teenage pregnancy among females and teenage fatherhood among males. Further, Grant and Hallman (2006:5) argue that 'school enrolment is most often viewed as protective, providing a structured setting in which children receive support and develop their capabilities and knowledge'. In contrast, many clinics are viewed as 'unfriendly' by young people living in South Africa (Arube-Wani, Jitta & Mpabulungi 2008; Faxelide, Musandu, Mushinge, Nissen & Zvinavashe 2008). Thus, once adolescents have dropped out of school, there are limited opportunities to reach them with basic risk-reduction and risk-prevention education.

For a variety of reasons, sex education frequently does not meet the needs of those in school: teachers are embarrassed (especially because of cultural taboos) to offer relevant messages (Van der Riet, Hough & Killian 2005; Van der Heijden & Swartz 2010); young people notoriously do not listen in a classroom context, believing themselves to be immune from harm (Swartz & Bhana 2009); youth are faced with context-irrelevant messages (such as abstinence education when already sexually active, or a prohibition on transactional sex when such sex is a means of survival); or children are not in school for long enough to ensure that messages reach their target. In addition, psychosocial distress is seldom, if ever, addressed (Jooste, Managa & Simbayi 2006), much less in a school context, and individuals frequently fall through the gap when it comes to identifying adolescents in trouble and referring them on for additional support. When identification does occur, except in the most resourced parts of the country, there is a dearth of mental health services for the majority of South Africa's peri-urban and rural poor who need help.

Peer education

Originally a tool to reach 'hidden populations' such as gay men and sex workers, peer education programmes have become popular as a preferred strategy among youth. Programmes that target sexual and reproductive health, specifically with regard to HIV prevention among adolescents, concentrate on harm-reduction information, prevention, early intervention and support (Campbell & Foulis 2002; Delp, Brown & Domenzain 2005; Story, Lytle, Birnbaum & Perry 2002; Wiist & Snider 1991). Studies in South Africa increasingly have evaluated peer education as a mechanism to promote behaviour and attitude change (Campbell & MacPhail 2002; Cornish & Campbell 2009; Dickinson 2009; Mash & Mash 2012; Mukoma, Flisher, Ahmed, Jansen, Mathews, Klepp, *et al.* 2009; Sloane & Zimmer 1993; Thupayagale-Tshweneagae 2011; Visser 2007).

Peer education can be understood as a delivery system that enhances social learning and psychosocial support, and seeks to build a constructive social environment by addressing socio-emotional barriers generally ignored in typically didactic education. It is a system that is considered to be adaptable to diverse needs and which can be implemented in a diverse range of settings, such as schools, the workplace and churches (Evans & Tripp 2006). In the developmental context of South Africa,

peer education has been regarded as an appropriate and cost-effective intervention with outcomes at both individual and societal levels (Visser 2007; Ward, Van der Heijden, Mukoma, Phakati, Mhlambi, Pfeiffer, *et al.* 2008).

By using a group of individuals recruited from among the target population as peer educators, structured peer education targets the peer group in order to change social norms (Chandan, Cambanis, Bhana, Boyce, Makoae, Mukoma, *et al.* 2008). Research has found that peer education is effective because peer educators share socio-economic circumstances with programme participants and, therefore, are able to make educational material accessible and credible to participants (Evans & Tripp 2006).

Addressing real youth needs that impact on HIV and AIDS, recognising the psychosocial or emotional 'desert' that many adolescents in poor communities inhabit, and finding ways to help young people for whom services are few are urgent tasks. In this context, peer education offers a promising way to address young people's needs for both psychosocial support and HIV-prevention education.

At its best, peer education offers a non-judgemental space for adolescents to approach and discuss issues and topics that are addressed insufficiently elsewhere or that are considered taboo within other contexts. It aims to deliver prevention education and psychosocial support that is more user-friendly and affordable than that provided by professionals (Sawyer, Pinciaro & Bedwell 1997), and that is more intensive, evidence-based and systematic than what families and communities might provide on their own. Thus, peer education exists in a space left empty by the gaps between formal education, social services, agency-led recreational or diversionary activities, and socialisation by the immediate or extended family.

There is, however, a dearth of data on the efficacy of peer education programmes in reaching the objective of long-lasting behaviour change among adolescents. This is not because none exist, but rather because there have been few interventions with a rigorous, longitudinal research design, and with effective collection of data that monitor both behavioural and health outcomes. Even fewer studies agree on standards, roles and systems within which peer education can function effectively.

Previous evaluations of peer education outcomes on youth (Flisher & Klepp 2009; Mukoma *et al.* 2009; Ward *et al.* 2008) reveal that peer education is less effective when implemented in contexts that do not promote dialogue among adolescents (for example, in life orientation classes) or where adequate institutional support is absent. Furthermore, several studies have shown no effect of peer education on participants, due largely to poor implementation of the peer education programme or to inadequate research designs (Mukoma *et al.* 2009; Sriranganathan, Jaworsky, Larkin, Flicker, Campbell, Flynn, *et al.* 2012). In the analysis that follows, a key consideration is how our chosen methodology reflects some of these challenges.

Studies using more rigorous designs have found that peer education programmes lead to increased levels of knowledge, testing and

help-seeking with regard to sexually transmitted infections, reports of condom use to prevent HIV infection, delayed sexual debut, and fewer reports of MCPs (Mash & Mash 2012; Sawyer *et al.* 1997; Visser 2007). Other research has found variously that programmes with peer educators are as effective as those taught by adults in changing adolescent knowledge about HIV, beliefs and risk behaviour (Ott, Evens, Halpern-Felsher & Eyre 2003; Sciacca & Black 1996), that adolescents are more likely to engage in interactive discussions after peer-led sessions than they are after sessions led by adults (Rickert, Jay & Gottlieb 1991) and that peer educators themselves receive enhanced health outcomes (Strange, Forrest, Oakley & The Ripple Study Team 2002).

The *Vhutshilo* approach

This article reports on the key findings of an evaluation of a peer education programme entitled *Vhutshilo* (meaning 'Life' in Venda) carried out by the Human Sciences Research Council (HSRC) of South Africa in 2009 and 2010. The focus is on the programme's effects on youth participants, and on the methodology used in the evaluation. The impact of peer education extends from building self-esteem to motivating youth to address challenges, to promoting academic performance and positively influencing behaviour (Damon 1984).

Vhutshilo is a curriculum-based peer education programme for adolescents designed by the Harvard School of Public Health (HSPH) and its South African Centre for the Support of Peer Education (CSPE), with financial backing from the US President's Emergency Plan for AIDS Relief (PEPFAR). The programme serves 14–16-year-olds and is facilitated by 17–19-year-olds. It seeks to encourage learning that could not be achieved in other settings such as the classroom or at home to develop the knowledge, attitudes, beliefs and life skills required for youth to engage in healthy behaviours. The programme consists of 13 one-hour sessions, with sequential learning objectives and participatory methods specifically developed for peer delivery in after-school settings. Illustrations and real-life scenarios encourage participants to think and talk with each other: *Vhutshilo* follows a cast of characters and a storyline that is sustained throughout the sessions, using visual cartoon characters.

The programme helps adolescent participants to express and cope with feelings of loss and grief, and to identify services, people and places in their community that provide help. In emphasising age-appropriate prevention strategies, *Vhutshilo* stresses healthy adolescent development, healthy relationships, awareness of the threats posed by inter-generational and transactional sex, and the dangers of MCPs. *Vhutshilo* was designed to be a practical intervention that could be implemented at scale under real-world conditions. It relies on effective adult supervision through appropriate selection, training and support of on-site supervisors from partner organisations, who in turn recruit, train and supervise peer educators.

The approach informing the *Vhutshilo* curriculum was derived through a national consultative process begun in 2000, which developed rigorous field standards and a comprehensive training and support strategy for South African peer education

programmes. These are described at length in the *Rutanang* documents that emerged from this process (Deutsch & Swartz 2002a, 2002b, 2002c, 2002d, 2002e). *Rutanang* (meaning 'Learning from one another') provides multiple standards that require peer education programmes to devote adequate attention to:

1. planning and mobilising a system in which peer education occurs, with linkages for follow-up and referral;
2. developing an adult infrastructure of training and support, alongside a cohort of trained and supported peer educators;
3. devising a learning programme and pedagogical frame;
4. managing and rewarding performance; and
5. monitoring and evaluating inputs and impact (Deutsch & Swartz 2002e).

Furthermore, *Rutanang* posits four roles for peer educators, who are trained and assisted by adult supervisors. These are to:

1. educate their peers in a structured manner;
2. informally role-model healthy behaviour;
3. recognise youth in need of additional help and refer them for assistance; and
4. advocate for resources and services for themselves and their peers (Deutsch & Swartz 2002e:37).

Rutanang standards were integral to both the design of *Vhutshilo* and its evaluation by the HSRC. While the broader study reported on a range of programme outcomes, this article reports on the changes in beneficiaries, and critically evaluates the overall research design.

Research design and methods

The research design for the evaluation was a mixed-method (qualitative and quantitative), longitudinal, quasi-experimental evaluation. Tools used included a quantitative survey questionnaire ($n = 183$) and semi-structured interviews ($n = 32$) for beneficiaries of peer education, along with observations of structured peer-led lesson delivery, focus groups, peer educators, community members and supervisors of sites. Only the survey questionnaire and the interviews are reported on in this article. The questionnaire consisted of Likert-type responses used to measure young people's changes in behaviour, attitudes and knowledge over time. These responses were further elaborated by asking a randomly selected sub-sample of adolescents to respond to semi-structured interview questions about the changes in their lives since participating in the *Vhutshilo* programme. Interviews were recorded and later transcribed, and analysed thematically using ATLAS.ti. Observation sheets documented the delivery of the curriculum during programme sessions by the peer educators (noting their strengths and weaknesses, facilitation abilities and the venue and capacity of the site). This study made use of a triangulation of methods to corroborate findings. Quantitative methods explored the overall impact of peer education on beneficiaries, qualitative methods highlighted their personal experiences and narratives, and observations verified the delivery of the programme as envisaged by its designers.

The study was longitudinal in the sense that it was not a once-off engagement with beneficiaries; rather, data were collected on several occasions over a period of time (Van der Riet *et al.* 2005). Intervention group data were collected twice: immediately after the programme was delivered (post-test) and 4 months later (delayed post-test). It was quasi-experimental in that it made use of a matched control group in order to compare outcomes with the intervention group. A quasi-experimental design uses either multiple groups or multiple waves of measurement across a time-series analysis (Agha 2002). In our case, both were used to strengthen the design. Due to practical limitations, however, it was not possible to conduct pre-tests, since all but three sites had begun *Vhutshilo* sessions before we were ready to enter the field. Thus, the control group test was used in lieu of a pre-test in our three-point design. A four-point measurement (including a pre-test for the intervention group) would have been stronger. Without measuring how much adolescents knew before the programme, there is no effective way to assess any real, long-lasting behaviour change that may have been attributed to the contents of the programme. Instead, we relied on our matched control group to provide the basis for comparison.

Ethical considerations

This study was approved by the ethics committee of the HSRC in South Africa and the Human Subjects Committee at the HSPH in the USA. All researchers undertook Harvard-certified ethics training and additional training on working with vulnerable youth. Written informed-consent procedures (administered verbally, but with written support documents) were used to obtain informed consent from adolescents' guardians/caregivers, and assent was obtained from youth beneficiaries, with the study being explained to them and their participation being invited. All participants were able to hand in signed consent and assent forms. Steps were taken to ensure anonymity and confidentiality in order to protect vulnerable adolescents from stigma. In this article, all names are pseudonyms. Youth were cautioned, in addition, about how confidences might still be betrayed, for example by other members of their groups.

Beneficiaries were given the choice of not answering items in the questionnaire or interview that made them feel uncomfortable, although researchers encouraged them to answer, and referrals were offered if participants showed distress. Some adolescents who completed the questionnaire left multiple items in the sexual behaviour section unanswered. So, while this opt-out addressed the ethics of our study, it did limit our ability to evaluate adolescent's actual sexual behaviours quantitatively. This was mitigated to some extent by qualitative interviews with participants.

Survey questionnaires were administered in respondents' language of choice, although most chose to complete the English version, using the vernacular versions as a reference. A fieldworker was in the room during survey completion, and answered questions of clarity. In the event, these were few; most had been resolved during extensive piloting of the instrument. Language remained, however, a key methodological challenge, since both sexual terms and nuanced responses (for example, 'sometimes', 'often' and 'almost always') can be difficult to

differentiate in translation. The practice of single-language surveying has been raised by Harzing, Maznevski and Country Collaborators (2002). Our approach of offering multiple languages addressed this issue, but was also time consuming – both in offering translations and in youth navigating multiple surveys.

Selection and sampling

The primary population of the study consisted of youth aged between 14 and 16 years (some were 17 but in the same grades as younger peers), who were beneficiaries of peer education delivered by supervised older youth aged 17–19 years. These participants consisted of mostly black youth living in impoverished conditions in townships and rural communities. During 2009/2010, *Vhutshilo* programmes for this age group were implemented at 11 sites in Gauteng and Limpopo. We selected eight sites for inclusion in the evaluation; the selection was determined by financial considerations, starting times of the programme, an even spread between implementing partners across sites, a desire for balance between peri-urban (township) and rural sites, and inclusion of sites that had participated in the pilot test of *Vhutshilo* for 10–13-year-olds in 2007/2008. For practical and logistical reasons, two sites dropped out along the way and were excluded from the evaluation. The result was 73 participants (43 girls and 30 boys) in the intervention group of a *Vhutshilo* programme, and 110 (75 girls and 35 boys) who were selected by implementing partners using the same criteria as employed to select *Vhutshilo* participants in the control group. It was envisaged that control group members would begin *Vhutshilo* programmes once the evaluation was completed.

Table 1 provides a summary of demographic characteristics of intervention participants in the *Vhutshilo* evaluation, including their socio-economic status (SES), obtained from the survey and analysed on a comparative scale. SES scores were derived from the assets youth had in their home, namely television, electricity, bicycle, car, tap water, and telephone (mobile or landline); the type of house each youth lived in, namely shack, informal settlement, backyard dwelling, traditional house, hut, flat and house with an inside toilet; and whether there was enough, too little or more than enough money in their household for food, clothes and other items.

So, for example, site 3B participants were the least poor, with an average score of 10.9, while site 1A was the poorest, with an average of 4.6 points. In order to arrive at these SES ratings, we considered a score of between 10 and 14 as indicating that youth were likely to be living above the poverty line, and that those scoring below 6 and 9 lived below the poverty line and were economically vulnerable, while those scoring below 5 were likely to be seriously vulnerable. For the purposes of this study, the poverty line is taken as being less than R593 *per capita* per month, as defined by Statistics South Africa in 2008 and reported in Armstrong, Lekezwa and Siebrits (2008).

Table 2 provides a comparison between the control group and *Vhutshilo* intervention group participants, with the latter separated into those who participated in the immediate post-test survey and those who participated in the delayed post-test

Table 1. Demographic summary of Vhutshilo participants included in the evaluation.

Variable	Organisation 1 (N = 25)		Organisation 2 (N = 23)		Organisation 3 (N = 25)	
	Site A	Site B	Site A	Site B	Site A	Site B
N	15	10	12	11	11	14
Age	14.3	14.4	15.3	14.2	16.6	15.9
Sex						
Girls	85%	50%	33%	18%	45%	100%
Boys	15%	50%	67%	82%	55%	0%
Grade	7.5	7.2	9.4	8.0	10.0	10.0
SES	4.6	7.0	7.0	9.0	7.7	10.9
Language	sePedi	xiTsonga	seSotho	seSotho and isiZulu	isiZulu and sePedi	seTswana

Table 2. Demographic summary of control and intervention groups.

Variable	Control group average (n = 69)	Vhutshilo intervention group post-test average (n = 68)	Vhutshilo intervention group delayed post-test average (n = 40)
Age	15.6	15.3	15.8
Sex			
Girls	68%	61%	60%
Boys	32%	39%	40%
Grade	9.3	8.8	9.4
SES	7.7	7.7	7.7
Language	seSotho	seSotho	xiTsonga and seSotho

survey. As can be seen, there was some attrition of intervention participants who completed the post-test survey (68 from a possible 73) and those who completed the delayed post-test survey (40 from a possible 73). In addition, in order to match the sample, the control group was reduced from 110 to 69 through a series of *post hoc* matching measures to exclude from the analyses the participants who did not demographically match the intervention group in terms of age, SES and involvement with the implementing organisation.

It is also important to note that since control members were already involved in sites of implementing partners in some way (although not in *Vhutshilo* groups), they could be expected to have higher social competencies than their peers who had no NGO or youth development involvement. As a result, it was expected that control group members were likely to perform at a higher level than a randomly chosen control group. Choosing control group members who had experienced some form of intervention constitutes good practice in terms of comparing the effects of an intervention (Fisher & Klepp 2009). Consequently, the differences encountered can be attributed confidently to effects of the *Vhutshilo* intervention.

Measuring behaviour change – developing indicators

Indicators were developed as measures of lasting behaviour change, and ultimately encompassed changes in help-seeking and supportive behaviour, decision-making skills, HIV knowledge, sexual and relationship health behaviours, attitudes and intentions (see Table 3). These indicators were derived from collaborative meetings with CSPE, from a close evaluation of the curriculum and from existing literature.

The survey questionnaire

To measure the impact of peer education on youth, questionnaires were designed by incorporating individual questions from existing scales and from previous peer education evaluations. During analysis, scores were compared to ascertain the difference, if any, between the control and intervention groups. Statistical analyses were restricted to those who completed the questionnaire (a response rate of 79%).

The qualitative component

The qualitative design component of the evaluation was intended to be more youth friendly and participatory, to offer deeper insight into findings arising from the questionnaires, and to provide contextual meanings to beneficiaries' experiences. Van der Riet *et al.* (2005:79) argue that participatory research techniques stress 'ways of assessing local and situated understandings' and 'local categories and frameworks for understanding and experience', whereas the quantitative component of research usually defines the way in which data are extracted from participants.

Primarily, individual interviews were used for in-depth assessment of the impact of the programme on youth beneficiaries of peer education. Questions focusing on difficult scenarios and problems youth face in everyday life were key to uncovering youth experiences with regard to the indicators we sought to measure (see Table 4).

Data were transcribed verbatim and deductively coded using indicators to compile themes. Multiple researchers used ATLAS.ti computer software to code collaboratively, with frequent meetings for discussion and refinement of codes. Researchers also wrote analytical memos as they coded. These procedures helped to

Table 3. Overview of indicators for *Vhutshilo*.

Indicator	Description	Sample questions for indicators
Help-seeking	Can <i>Vhutshilo</i> members identify places and people they can go to for help? Do members report coping skills and self-care? Do they know how to form appropriate, trusting relationships? Do they feel connected to their community, or is there a sense of hopelessness?	Q79 I have friends I can depend on Q62 When I share personal things with friends, it makes me feel uncomfortable Q70 My friends are good at helping me solve problems
Supportive behaviour	Do they know how to identify people in need of help? Do they demonstrate willingness and ability to help friends and be supportive to others generally?	Q12 Friends come to me when they have problems Q28 I have a deep (close) sharing relationship with at least one friend
Emotional intelligence	Are <i>Vhutshilo</i> members better able to recognise, name and appropriately express their feelings/emotions? Are members able to process grief, and recognise emotional consequences to actions?	Q18 I know why I feel differently at different times Q47 I have control over my emotions Q67 I know when to speak about my personal problems to others Q69 I like to tell other people what I'm feeling
Decision-making	Do youth demonstrate better decision-making and problem-solving skills, especially in the context of HIV risk?	Q46 When making decisions I like to collect a lot of information Q53 I prefer to leave decisions to others (even if it affects me)
Future orientation	Do members demonstrate goal setting and optimism about the future? Can they identify their goals and make plans or changes to reach them?	Q13 There's no use in really trying to get something I want, because I probably won't get it Q34 I will have more good times than bad times
Gender orientation	How do youth perceive gender roles and attitudes?	Q14 If a boy gives a girl presents, she must have sex with him
HIV, sexual and relationship health – knowledge	Are youth able to demonstrate accurate HIV prevention knowledge, and are they able to dispel HIV-related myths?	Q48 A pregnant woman who is HIV-positive can transmit HIV to her unborn baby Q16 A person can get infected with HIV by holding hands with an HIV-positive person
HIV, sexual and relationship health – attitudes	What are the attitudes and beliefs surrounding HIV-related information? Are these attitudes conducive to either a healthy or a risky belief structure?	Q36 My friends believe it's OK for people my age to have sex with several different people in the same month
HIV, sexual and relationship health – Behaviour and Intentions	Do youth plan on behaving in a manner conducive to HIV prevention? Is their current behaviour placing them at increased risk of HIV infection?	Q84 Do you think you will be able to make sure that your partner goes for an HIV test before having sex with you?

produce a reliable understanding of adolescents' knowledge, attitudes and behaviours, and also ensured that illustrative incidents and narratives were captured and incorporated into the evaluation.

Findings

Our initial analysis of the quantitative data investigated differences by indicator between the control, post-test and delayed post-test groups. A second analysis was done, this time by individual questions rather than by indicator. Finally, the data were analysed for each indicator by implementing organisation and site, highlighting how the differences, especially SES differences, between the sites may have influenced the effectiveness of *Vhutshilo*. Each of these analyses will be considered in turn.

Comparison by indicator

Initial analysis of the quantitative data, using independent two-tailed *t*-tests (see Table 5), showed no significant difference when measuring the impact of *Vhutshilo* on each of the multi-itemed indicators as described across each of the three groups. Although there are some differences between the control group

measurement, the post-intervention measurement and the delayed intervention measurement, they are not significant.

In addition, control group members, in some cases, scored higher than *Vhutshilo* members. However, since these differences were not statistically significant, the changes could simply have been due to chance and not the effect of the *Vhutshilo* programme.

Comparison by individual survey question

To further examine results that may have been obscured by indicators comprised of multiple questions, a second series of analyses was conducted using independent *t*-tests (between control and post-test groups, and between control and delayed post-test groups) and related sample *t*-tests (between post-test and delayed post-test groups) on each of the individual questions in the questionnaire. Table 6 presents the differences that meaningfully can be ascribed to *Vhutshilo* influence. Specifically, these questions indicated improved supportive behaviour, future orientation, and both improved knowledge and more positive attitudes about HIV/AIDS and sexual and relationship health.

Table 4. Sample interview questions.

Indicators	Questions
Supportive behaviour	If someone came to school crying, what would you do? (Probe for why that person might have been crying, seek advice, ask what happened, tell an adult, ignore the person?)
Supportive behaviour	What kind of problems do young people have? Can you tell me a story of when you helped someone with a problem?
Help-seeking	Have you ever had a similar problem? Can you tell me a story about a time when you went to find help for this personal problem you had?
Perceived social support	Are there people in your life that you know can help you? How do you react if people offer to help you? (Probe for 'why do you think you react that way?')
Protecting friends	What do young people need to be protected from? What are the ways that you can protect your friends? (Probe for what protection means?)
Emotional intelligence	Has anyone close to you moved away or passed away? What was your relationship like with this person? How did you feel when they left/passed? How does it feel to talk about or remember this someone who has died? What changes when this person leaves?
Diversory activities	What are some of the things you do that put you at harm or in danger? What things do you do to stay out of trouble?
Sexual health	What are some of the things that young people may do that put them at risk of HIV infection? And you?
Gender	How are girls' lives different from boys' lives?
Future orientation	What are some things about your life that you would like to change? What cannot you change? What is your dream for your life? What help do need to achieve your dream?

Supportive behaviour

In terms of supportive behaviour towards friends (Q68), there was a statistical difference between the control group and post-test intervention group ($p = 0.05$) and between the control group and delayed post-test group ($p = 0.02$). Narratives from youth interviews showed that helping others was a prevalent personal experience, and that such supportive behaviour was enhanced as they learnt skills from the *Vhutshilo* programme regarding how to help their peers more effectively. The kind of support friends sought included dealing with multiple vulnerabilities and adverse circumstances – relationship troubles, substance abuse, teenage pregnancy, sexual and physical abuse, abortion and family pro-

blems. Grace, Mashudu and Katlego provide vignettes of supportive behaviour and their experiences of offering help:

She [a friend] wanted help about [pause] having been raped [pause] ... how you can solve that problem. I told her to find a person she trusts, an older person because [the older person] can solve the problem that she has. It can be any person that she trusts. (Grace, female, 18, Gauteng)

It was my old friend ... then this boy slept with this girl ... this girl found out she was pregnant. And he didn't know how to tell his mother. He wanted to raise money to give

Table 5. Overall comparisons per indicator for *Vhutshilo*.

Indicator	Control group ($n = 69$)	<i>Vhutshilo</i> post-test ($n = 68$)	<i>Vhutshilo</i> delayed post-test ($n = 40$)	Control group vs. post-test p	Control group vs. delayed post-test p
Help-seeking	60	58	59	0.53	0.84
Supportive behaviour	57	56	59	0.81	0.58
Emotional intelligence	61	58	58	0.27	0.41
Decision-making	53	51	49	0.56	0.39
Future orientation	48	53	58	0.31	0.14
Gender orientation	54	54	59	0.90	0.13
HIV knowledge	73	66	75	0.06*	0.68
HIV attitudes	59	57	61	0.48	0.37
HIV intentions	44	42	42	0.69	0.80

Note: No statistically different variations between groups were found for these clustered indicators either at the $p \leq 0.05$ 95% or $p < 0.01$ 99% level of confidence.

*Statistically significant at the $p \leq 0.10$ 90% level of confidence.

Table 6. Statistically significant differences between control group and *Vhutshilo* group post-test and delayed post-test on individual survey questions.

Individual questions	Control n = 69	<i>Vhutshilo</i> post-test n = 68	<i>Vhutshilo</i> delayed post-test n = 40	Significant difference		
				Between control and post-test p	Between control and post-test p	Between post- test and delayed post-test p
Supportive behaviour						
Q68 My friends think that I'm good at helping them solve problems (Procidano & Heller 1983)	Percentage who said it is true 74%	90%	96%	0.05*	0.02*	0.31
Future orientation						
Q65 I never get what I want, so it's stupid to want anything (Kazdin, French, Unis, Esveldt-Dawson & Sherick 1983)	Percentage who said it is not true 53%	68%	76%	0.10	0.03*	0.42
HIV knowledge						
Q33 Having sex with a virgin cures AIDS (designed item)	Percentage who said it is not true 82%	71%	93%	0.17	0.18	0.02*
Q49 A pregnant woman who is HIV positive can transmit HIV to her unborn baby (Chandan <i>et al.</i> 2008)	Percentage who said it is true 67%	58%	81%	0.30	0.16	0.03*
HIV attitudes						
Q36 My friends believe it's OK for people my age to have sex with several different people in the same month (Basen-Engquist, Masse, Coyle, Kirby, Parcel, Banspach, <i>et al.</i> 1999)	Percentage who disagreed or strongly disagreed 82%	85%	91%	0.49	0.05*	0.09
Q54 I believe it's OK for people my age to have sex with several people in the same month (Basen-Engquist <i>et al.</i> 1999)	Percentage who disagreed or strongly disagreed 72%	80%	91%	0.13	0.00**	0.05*

*p ≤ 0.05, significant at the 95% level of confidence.
**p < 0.01, significant at the 99% level of confidence.

this girl so that she can do [an] abortion ... I said he must tell them. (Katlego, female, 18, Gauteng)

I tell her [my friend], maybe she was raped two months ago ... I would advise her to accept that it had happened to her. I realised that I won't be too much of help ... [so] I just refer her to my superiors [adults]. (Mashudu, male, 15, Limpopo)

Future orientation

Concerning attitudes or expectations about the future (Q65), a statistical difference was found between the control group and delayed post-test group ($p = 0.03$). In terms of reducing sexual risk behaviour (a principal aim of the intervention), the delayed post-test showed that *Vhutshilo* youth exhibited less risk behaviour than either they or the control group had displayed earlier. Qualitative interviews provided further evidence that positive future orientation was stronger in *Vhutshilo* group members than in their control group peers. Thematically, education was a goal that nearly all participants aspired towards in order to succeed, as was the related aim of escaping the cycle of poverty to be able to pay for a good education. Young people's comments, reflecting this drive towards future achievement, included: 'My dream is to see myself tomorrow being an educated person'

(Simphiwe, male, 17, Gauteng), and 'One should work hard in order to get what he/she wants' (Brian, male, 17, Gauteng). In addition, at a site in Soweto, young people made comments such as: 'Be a responsible person so that you can change'; 'Think for yourself and [about] the consequences'; 'The future depends on an individual and [on] his or her behaviour'; and 'Think before you do anything ... Think for tomorrow'.

HIV knowledge

On certain aspects of HIV information (prevention myths, Q33, and transmission facts, Q49), a statistical difference was found between the post-test and delayed post-test results (Q33 $p = 0.02$ and Q49 $p = 0.03$). It was clear that these young people had retained the information acquired through the *Vhutshilo* sessions. During the qualitative interviews with *Vhutshilo* participants, almost everyone could identify at least two modes of HIV transmission, and multiple risk factors that exist for contracting HIV (such as engaging in sexual intercourse, having MCPs, avoiding condom use, transactional sex and drinking alcohol). They also mentioned susceptibility to peer pressure, not having sufficient information regarding sexual health and lack of education as pertinent factors. Invariably, everyone mentioned abstinence, sticking to one partner and the use of condoms as prevention methods.

Almost all reported that they could demonstrate the proper use of condoms. Some mentioned the awkwardness associated with talking about sex from a cultural perspective, but noted that this was easier to do with peers than with adults.

Qualitative interviews provided many examples of the significance attached to knowledge acquisition by *Vhutshilo* peer education beneficiaries, many of whom spoke about the benefits of individual sessions. This is apparent in the following quotes:

[Session 8] ‘Safe with one or none’, yes because we were all keen to hear what is happening during sex. They want to know what you mean about a healthy sex relationship [Session 9], what do you do and what do you use . . . Like in a healthy relationship there has to be trust, communication, love, you have to be there for each other. (Dipuo, female, 15, Gauteng)

[Session 10] ‘Something for something relationship’ . . . it’s something that happens daily, it happens all the time . . . I have learnt that [I must] love someone for who he is and not because of what he has. (Katlego, female, 18, Gauteng)

[Session 5] ‘Grief and Loss’ . . . We were talking about our emotions . . . We were crying – like the things we were talking about made me appreciate everything I have in life. (Omphile, female, 15, Gauteng)

Because about violence and crime [Session 7] I realised that if you’re involved in crime and violence, it’s not simple, you don’t gain, you don’t get something, you don’t succeed if you are involved in one of those things. (Simphiwe, male, 17, Gauteng).

HIV attitudes – MCPs

With regard to attitudes towards MCPs, a statistically significant difference was found between the control group and delayed post-test group for two questions (Q36 $p = 0.05$ and Q54 $p = 0.00$), and between post-test and delayed post-test groups for Q54 ($p = 0.05$). These signify a change in attitude among participants, both personally and in what they think their friends believe, as a result of the *Vhutshilo* intervention. During qualitative interviews, these opinions about MCPs were confirmed. Dipuo and Grace reflected many others’ views about the risk of MCPs:

Others drink . . . maybe a person [goes] to a club or a tavern . . . they drink and then meet strangers and have one night stands . . . not knowing the person’s status, you can be infected. (Dipuo, female, 15, Gauteng)

It’s having sex and not using a condom . . . It’s walking at night with boys . . . It’s being with many boys at once . . . Yah, it’s agreeing when a boy says he wants to sleep with me . . . If I agree that I want to sleep with him, it will put me in danger. (Grace, female, 18, Gauteng)

Site differences

Further analysis explored the relationship between demographic markers such as age, sex, grade, SES and recreational profiles,

Table 7. Site comparisons per indicator and SES.

Site	Overall indicator score (post-test) (%)	Site rank on indicator score	SES score	SES score rank
Organisation 1 Site A (Limpopo)	42	6	4.6	6
Organisation 1 Site B (Limpopo)	60	2	7.0	4
Organisation 2 Site A (Gauteng)	56	3	7.0	4
Organisation 2 Site B (Gauteng)	48	5	9.0	2
Organisation 3 Site A (Gauteng)	54	4	7.7	3
Organisation 3 Site B (Gauteng)	68	1	10.9	1

on the one hand, and performance on psychosocial indicators, on the other. In order to make the comparisons meaningful, all indicator scores were summed per participant and compared to demographics using Pearson’s correlation co-efficient (r). Medium correlations were found between indicator scores and age ($r = 0.33$), educational grade ($r = 0.38$) and SES ($r = 0.44$).

Expanding on this analysis, we compared individual sites’ (post-test) psychosocial indicator scores with their SES scores. Here our comparison is descriptive, showing relative rank (see Table 7).

Not surprisingly, the sites with a relatively higher SES also did better on psychosocial indicators. Thus, Site 3B, situated in a peri-urban township in Gauteng, had an average SES score of 10.9 out of 14.0, and achieved the best results as a group on the indicator scores (68%). Correspondingly, site 1A in rural Limpopo, with an SES score of 4.6 out of 14, had the poorest performance on indicator scores (42%).

Discussion

SES and peer education

Results regarding the relationship between SES and peer education tentatively indicate that extremely low SES may weaken the effectiveness of peer education, while marginally higher SES may promote the effectiveness of peer education. Site 1B in Limpopo provides a case study of how this may occur.

Site 1B was located in a deep rural setting, and group members scored an average of 7.0 out of 14.0 on the SES scale. None had a father present in their household and all were taken care of by a mother, excepting one member who was under the care of a grandmother. All lived in shacks in the village and reported

having electricity and a TV (except for one), while none had inside toilets or taps, although these were a short walk away. Most reported having 'enough money for food but not clothing'. None of these factors is unique in South Africa, but, despite significant disadvantage, these participants managed to do remarkably well in terms of psychosocial indicators. The site 1B group did not perform the best in terms of *Vhutshilo* impact. Other sites that were better supported, that had fewer extremely poor youth and that had experience of a previous *Vhutshilo* programme (for 10–13-year-olds) performed better. However, Site 1B provides an example of what is possible in a resource-constrained context.

Generally, peer education beneficiaries from Site 1B performed second-best of all sites with regard to the nine overall indicators. Supportive behaviour; HIV, sexual and relationship health knowledge; future orientation; and emotional intelligence were amongst the highest. Site 1B adolescents did not score well on decision-making abilities, which could be attributed to their environmental context of poverty. However, they did remarkably well on gender orientation and HIV attitudes, given their conservative rural context (confirmed by community members' responses in focus groups). Furthermore, as was the case with other groups, site 1B beneficiaries' scores increased in the delayed post-test survey.

Knowledge, attitude and behaviour change

While the six statistically significant findings we have reported are by no means conclusive, they do point towards peer education's potential to intervene in HIV infection rates amongst youth, and to bolster the psychosocial capabilities required to cope with HIV's antecedents and sequelae. While both adult and peer-led interventions have been shown to have moderate effects on youth behaviour (Maticka-Tyndale & Barnett 2010), peer education's influence on peer norms, and its ability to create dialogue on issues pertaining to sexual health risk and behaviour, is unique and especially useful in reaching vulnerable youth.

Since we know that young people's positive future orientation is often associated with decreased risk-taking behaviour, and increased agency and care in taking positive decisions (Swartz 2009), peer education's role in increasing future orientation is of importance. Similarly, since MCPs are a current driver in the pandemic (Mmbaga, Helleve, Leyna, Masatu, Onya & Klepp 2011), changing young people's attitudes, and their perceptions about their peers' attitudes, is a step towards mitigating the phenomenon. The view of young people that it is inappropriate and risky to have MCPs in the same month is a particularly strong finding.

Participants' knowledge concerning HIV and AIDS increased between the survey immediately following the intervention and the delayed survey 4 months later. While it is possible to assume that there may have been other interventions that contributed to this increase in knowledge, the sample covered six sites and it is unlikely that all would have experienced similar interventions. It is, therefore, reasonable to conclude that *Vhutshilo* not merely raised knowledge levels, but encouraged participants to actively seek out knowledge concerning HIV and sexual health over time after the programme had ended. Thus, it may be

argued that *Vhutshilo* increased young people's sense of agency. These findings are in keeping with those recorded with regard to MCPs (Mash & Mash 2012), changes in HIV attitudes and knowledge (Ott *et al.* 2003), and young people's proclivity to engage more actively in discussion after peer-led sessions (Rickert *et al.* 1991).

Methodological limitations

However, given the methodological limitations of the study, these results are at best pointers to potential impact and need to be verified in further studies. To sum up, there were three main methodological limitations in this study. First, the study made use of a once-off control group assessment as the baseline for comparison against the post-test and delayed post-test intervention group assessments to measure the impact of peer education. A pre-test evaluation (in addition to a control arm) would have provided a more reliable basis for comparison between groups. Second, the study was limited by its small sample size, which reduced the statistical power of the evaluation. Third, the unavailability of existing survey questions to measure the impact of peer education and its role in behaviour change, and the lack of resources required to design new questions, was a final limitation. Mash and Mash (2012) have also noted the need for more effective peer education evaluations. However, research will always be constrained by available resources.

Conclusion

This article has examined the impact of a peer education programme on adolescents. The evaluation offers a number of important conclusions about the effects of peer education, and how to measure these appropriately. Beneficiaries seemed to outperform the control group with regard to specific questions measuring supportive behaviour, future orientation, and knowledge and attitudes about HIV, AIDS and sexual and relationship health. A key finding concerned peer education's possible effect on youth agency, knowledge and help-seeking behaviours, since scores increased among *Vhutshilo* members in the 4 months after the conclusion of the intervention. A particularly meaningful finding concerned these *Vhutshilo* members' negative attitudes towards MCPs and positive attitudes about the future; both are key to reducing rates of HIV infection in sub-Saharan Africa.

Finally, *Vhutshilo* contributes to our understanding of peer education and of the recipients to whom it might be most valuable, namely under-resourced, impoverished and rural or peri-urban youth. These youth, who struggle with poor quality education and live in economically fraught contexts with little social support, nonetheless, showed evidence of improved knowledge of support networks and an expanded emotional repertoire by the end of the programme, and 4 months later. At both an individual and group level, many with low SES showed great improvement with regard to programme indicator scores. Site 1B (described above) further demonstrated how effective peer education can be, even under the most challenging conditions. In a context of scarce resources and limited social services, peer education has the potential to fill a large gap in the socialisation of youth. When well organised and properly supported, peer

education programmes (and the *Vhutshilo* curriculum, in particular) provide vulnerable youth with otherwise unavailable opportunities to develop psychosocial skills and informational resources that contribute to the changing of norms, attitudes and behaviours. Peer education programmes, such as *Vhutshilo*, therefore, can contribute towards HIV/AIDS-prevention efforts by providing essential support and positive role-modelling to youth, which can be elusive in the disruptive context of poverty. The evaluation of these efforts, however, requires further and ongoing attention before increased roll-out of peer education programmes can occur.

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