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Mixed Methods Community-Engaged Evaluation: Integrating Interventionist and Action Research Frameworks to Understand a Community-Building Violence Prevention Program

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Abstract

While mixed methods research can enhance studies of intervention outcomes and projects where research itself transforms communities through participatory approaches, methodologists need explicit examples. As the field of interpersonal violence prevention increasingly embraces community-level prevention strategies, it may benefit from research methods that mirror community-building prevention processes. A multiphase mixed methods study with sequential and convergent components assessed the feasibility, and impact of a prevention program to change social norms and increase collective efficacy in towns. Joint display analysis created a nuanced picture of the acceptability, feasibility, and impact of the program. This article contributes to the field of mixed methods research by bridging discussions of "interventionist" studies with models of community-based participatory mixed methods research into a combined community-engaged method.

Keywords

interventionist research; sexual violence; prevention; multi-phase mixed methods

A number of recent theoretical discussions have pointed to the importance of mixed methods research (MMR) for "interventionist evaluation" and "dissemination and implementation"

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of health related programs (Fetters & Molina-Azorin, 2020; Palinkas & Cooper, 2017). Arguments have also been made about the utility of MMR for community-based work, particularly a focus on work with communities that have been traditionally under-resourced and marginalized (Badiee et al., 2012; Campbell et al., 2017; DeJonckheere et al., 2019). Both lines of discussion can be grounded in the paradigm of "dialectical pluralism" that highlights the new synthesis of ideas that emerge from many viewpoints on an issue (Johnson & Schoonenboom, 2016). To date these two areas of applied MMR have mainly been separate lines of discussion and both have been described as in need of more detailed discussions of how MMR was implemented (DeJonckheere et al., 2019). One purpose of the current study was to bring these strands together to illustrate how an integration of design principles of intervention research with MMR methods from community-based action science can create an important additional area of MMR for community-engaged projects. These projects focus on program evaluation of community-level programs that may not be well suited to intervention designs like randomized controlled trials (Goodman et al., 2018) and that may be more researcher-driven than traditional participatory action methods.

The field of interpersonal violence prevention evaluation is a good location for illustrating a community-engaged MMR approach. Sexual violence (SV) (defined as sexual activity, including contact or intercourse, that takes place without consent) and intimate partner violence (IPV) (including physical, psychological, sexual, and stalking violence by a current or former partner) are pervasive public health issues in the United States (Smith et al., 2018). These forms of violence lead to multiple long-term negative health effects and are costly to society (Peterson et al., 2018). Despite increased research on sexual and relationship violence prevention over the past few decades, to date, very few strategies have led to long-term reductions in these problems (DeGue et al., 2014). One reason could be that the vast majority of prevention strategies focus on changing individual attitudes (DeGue et al., 2012) rather than on changing modifiable risk and protective factors at the relationship and community levels of the social ecology (Kim, 2020; McCauley et al., 2019). Evaluation of community-level work requires new methods, and a mixed methods approach has much to offer (Creswell & Clark, 2017). A multi-phase mixed methods evaluation design studied the feasibility and impact of Green Dot Community (GDC), a sexual and relationship violence prevention approach. The purpose was to fill a gap in discussions of the use of mixed methods research for program evaluation by integrating methodological/theoretical discussions of "interventionist evaluations" (Fetters & Molina-Azorin, 2020) like randomized control trials with discussions of community-based participatory action research (DeJonckheere et al., 2019). An aim was also to introduce MMR researchers more broadly to interpersonal violence as an area of study that can benefit from MMR methodologies.

Bringing Together Interventionist and Community Action MMR Designs

Recently, a growing number of methodological discussions have described the importance of MMR for evaluating interventions in content areas like health and prevention (Drabble & O'Cathain, 2015; Fetters & Molina-Azorin, 2020; Palinkas & Cooper, 2017). Intervention studies use MMR to enhance randomized control trial methods (Drabble & O'Cathain, 2015; Fetters & Molina-Azorin, 2020; Newton-Levinson, et al., 2020). Another group of MMR researchers discuss community-based or action research (DeJonckheere et al., 2019;

Ivankova & Wingo, 2018). This work more clearly centers partnerships with community members as coresearchers and research designs that are less research team driven than the interventionist studies described above. For example, Badiee et al. (2012) present a revised model for community-based MMR to study community problems that includes beginning projects with methods that connect with community to understand how community members see an issue—what they term "connecting and diagnosing." This is followed by "prescribing and implementing," an aspect of collaborative research that resembles the process evaluation MMR models described above. For example, organizational variables, including key agencies' (i.e., crisis centers, schools) motivation, capacity, and perceived needs all affect implementation of interventions that are grounded in community engagement (Kim, 2020). A mixed methodology approach can help capture this complexity. Community-based MMR work can also include an "evaluating" stage that may also draw from interventionist research. Importantly, the revised model captures a stage that is often less discussed in the interventionist discussions, the stage of "disseminating" (Badiee et al., 2012). Action research requires that findings be returned to the community and used to create change. The integrated and often contextually rich data from MMR may facilitate this dissemination process which itself is part of supporting the sustainability of programs (Palinkas & Cooper, 2017).

In the current paper a blending of interventionist and community action MMR research frameworks is described using Badiee et al.'s (2012) revised conceptual framework and applied to evaluation of a community program in an approach that was more researcher driven (and thus not participatory action research) and yet community engaged. Badiee et al.'s (2012) revised model centers how MMR can integrate all of these phases and purposes which overcomes the ways in which prevention evaluation typically describes process evaluation (which often includes qualitative methods) separately from impact evaluation (typically quantitative). In this way the MMR design allowed us to mirror the community-building approach of the prevention strategy itself in the design of the evaluation. The study then also serves to introduce MMR researchers to its application in the violence prevention field.

An Illustrative Community-Level Violence Prevention Program

Green Dot Community is a form of primary sexual and relationship violence prevention that encourages prevention activities that reach variables outside of an individual's attitudes to engage community building (Lazarus et al., 2017) The approach trains individuals but also considers the mesosystem, a "relational level" in which connections exist between individuals (like peers) in different immediate environments (microsystems) in which an individual spends time (e.g., school or work) (Bronfenbrenner, 1992). The Green Dot Community prevention approach focuses on catalyzing relationships between individuals at the relationship layer and building interconnections or "interdependence" between community organizations (communities, government structures) (Chan et al., 2016). The program uses capacity building trainings of key individual community leaders, builds relationships among town individuals and organizations through community action events, and brings members of organizations together to implement social marketing campaigns to promote community engagement and coalition building linkages (Flood et al., 2015;

Townsend, 2018). The program aims to build two community social processes that are critical pieces of the social ecological model—collective efficacy (people working together to support one another and solve problems) and social norms (perceptions of what others in town do or think should be done about prevention that support everyone's role in prevention and decrease tolerance of violence)—in the service of reducing violence. The program also promoted third parties (active bystanders) taking prevention actions to reduce violence when risk is present (Banyard et al., 2017).

Methodological Aims

The purpose of the current research study was to expand on work by mixed methodologists on the value of mixed methods for "interventional evaluations" (Fetters & Molina-Azorin, 2020) including illustrating how several frameworks related to evaluation can be integrated through the example of an evaluation of a community-based violence prevention program. In particular, the current study aims to illustrate an integrated approach that can help de-silo the MMR conversations about evaluation research, discussions that seem to focus either on heavily researcher-initiated designs like RCTs or participatory designs such as CBPR that are participant-led. The current study integrated two frameworks described by Drabble and O'Cathain (2015)—the temporal and process evaluation approaches and also used elements of community-based MMR (Badiee et al., 2012; Campbell et al., 2017; DeJonckheere et al., 2019) but without being fully participatory action research. The study illustrates what might be gained by blending these approaches particularly for evaluating community-engaged programs. This article also aims to introduce the audience of the *Journal of Mixed Methods Research* to the field of violence prevention evaluation research that could benefit from mixed methods research but has remained largely siloed from it.

Empirical Aims

The empirical research aims were to assess feasibility/acceptability, diffusion, and impact of Green Dot Community on attitudes and behaviors of the primary prevention audience, adults in two towns. Impact was investigated longitudinally and cross-sectionally.

Methodological Overview of the Current Study

The current study was a multi-phase mixed method design that included sequential and convergent components (See Table 1 and Figure 1). The study followed Badiee et al.'s (2012) revision of Stoecker's model for community-based MMR through four phases: (1) connecting and diagnosing; (2) prescribing and implementing; (3) evaluating; and (4) disseminating. The last phase was particularly important given research that shows that dissemination is understudied in community-based MMR research articles (DeJonckheere et al., 2019).

This work is grounded in the paradigm of "dialectical pluralism" (Johnson & Schoonenboom, 2016) which highlights the importance of incorporating many viewpoints. This is particularly important in research on community-level programs as there are many voices in communities related to prevention impact and implementation. In this study, mixed methods were used to capture different perspectives—those of community leaders,

prevention implementers, and citizens who were the intended audience for the prevention program (Douglas et al., 2010; Flick et al., 2012)—over several phases of implementation of Green Dot Community. This is also consistent with a critical realism paradigm in MMR that contextualizes program outcomes through "generative logic" and recognizes that key explanations for program effects may not be captured in narrowly defined empirical outcomes (Allana & Clark, 2018, p. 3).

In the connecting and diagnosing phase, key stakeholder interviews were used to better understand how community leaders thought about violence prevention and the current readiness of their community for new prevention work. The community readiness model uses interviews as a foundation for prevention implementation (Edwards et al., 2000). Narratives help assess how towns or neighborhoods differ in their levels of awareness, motivation, and capacity for prevention (Edwards et al., 2000). Multiple stakeholders (adults, youth, town leaders, prevention professionals) may connect with prevention in different ways and offer different insights into successes and challenges that affect program implementation. A baseline survey of adults in the community was also included in this phase (see below).

Monthly check-in interviews with the central agency involved in implementation occurred throughout the prescribing and implementing phase to better capture the process of prevention (Drabble & O'Cathain, 2015; Steckler et al., 2002). These were followed sequentially by a phase of exit evaluation interviews with members of the community prevention implementation committee to provide data on factors that might explain implementation and individual attitude and behavior outcomes.

The evaluation phase brought in quantitative data using a quasi-experimental design that matched prevention communities to control towns similar demographically. This quantitative matched comparison community panel method included three surveys; one before (described above as part of the connecting and diagnosing phase), one during, and one after implementation. Surveys examined diffusion and whether key outcome attitudes and behaviors changed among adults in GDC-exposed towns compared to matched comparison towns (see Table 1 for overall view of data collection and Figure 1 that shows the analysis process). A second set of community leader interviews provided a sample of views about prevention after Green Dot Community, parallel to the third survey. Finally, dissemination activities are described. The parallel sets of data in each phase provided rich data that was returned to community organizations at each phase of the research. A more integrated set of reports were prepared along with broader dissemination through a researcher-practitioner partnered activities.

Data Analysis Framework

Independent analyses were done of each phase and type of data. These data analyses aims or hypotheses are described in more detail individually below. It was an equivalently driven project with both qualitative and quantitative data informing the analytic framework and conclusions (Bronstein & Kovacs, 2013; Fetters, 2019) (see Figure 1). Key themes in the findings from each time point and data source were compared and contrasted to find areas of convergence and divergence or "fit." These were presented in a joint display including

meta-inferences (Fetters, 2019). Negative case analysis and member checking (discussing findings and themes with community partners) were strategies used to enhance the analysis (Patton, 2015). All components of the study were approved and overseen by a Human Subjects Review Board.

Connecting and Diagnosing.—The single aim of this phase was to use content coding of key informant/community leader interviews before and after implementation of GDC to reveal variations in community readiness as expressed in leaders' narratives of how and where prevention happens in their community. All communities were expected to be similar in levels of community readiness (Edwards et al., 2000), with most prevention originating from crisis centers, and more focus on tertiary prevention and response than primary prevention that engages all community members. Researchers examined what leaders' answers revealed about norms at baseline.

Planning and Implementation: Feasibility and Acceptability.—The first aim was to complete exploratory interviews with prevention implementers to describe how prevention efforts to change social processes in medium-sized communities unfolded (including barriers to change). Specifically, perceptions of the feasibility and acceptability of GDC were elicited. The perspective of preventionists helped us better understand findings from the direct mail survey. The second aim was to complete key informant follow-up interviews with community leaders to examine their views of acceptability and potential changes in community readiness.

Evaluation Aims: Impact and Diffusion Assessment.—Three hypotheses were tested in the evaluation. First, surveys were expected to indicate that more than 15% of the sample was aware and engaged with GDC; the survey completion goal was 48% or more (exceeding Rogers' diffusion of innovation threshold for both early adopters (first 15% of a population) and early majority (another 34%)). Second, GDC was expected to lead to increases over time in adults' perceptions of collective efficacy and community readiness, prosocial injunctive and descriptive norms, and bystander action in GDC-exposed towns, compared to comparison towns. Third, adults reporting exposure to GDC within GDC-exposed towns were expected to obtain better scores on positive social processes (collective efficacy and social norms) than adults who did not report any GDC exposure.

Methods and Results

Phase I: Connecting and Diagnosing—Baseline Key Informant Interviews

These aims were investigated mainly through baseline interviews with community leaders. A new sample of leaders were also engaged in phase 3 after prevention implementation.

Procedures.—Key informants were identified using several methods during two phases of the research (baseline and post-implementation, see Data Collection Table 1). Each of the four local crisis centers provided names of key stakeholders who were in leadership positions. Further, the research team created a list of four categories of leadership positions (non-profit/health and human services delivery, local government/law enforcement, education-related, and commercial/business owner). Using websites for each type of

organization, the research team identified leaders and their contact information. A snowball technique was also used, in which each key informant was asked for recommendations of other community leaders. Email and follow-up phone calls were used to invite each participant to take part in a 20-minute semi-structured interview. At baseline, all interviewees volunteered their time. At the second time point, all participants (a mixture of those interviewed before and new leaders in similar roles) were compensated for their time with a US$10 gift card. With the participant's consent, the interviews were audio-recorded and transcribed verbatim. No participants withdrew from the study.

After answering demographic questions, participants were asked to describe prevention such as: "How important are sexual assault and domestic violence as issues to people living in this town?" "What efforts to prevent or address SV/IPV are already going on?" Specific to GDC, participants were asked "Are you aware of GDC in town?" Interviewers used follow-up questions to gain further details and examples from participants.

Sample.—At baseline 53 community leaders across the four towns were invited. Thirty-eight (71.7%) agreed to an interview (9 or 10 from each town). Most participants both worked and lived in town, and average length of residency ranged from 6 months to 40 years. Leaders represented a range of positions (including law enforcement, schools, non-profit leaders, business owners). Seventy-five people were invited to interview during project year 4, and 28 agreed to participate (between six and eight per town) with a similar distribution of age, gender, and position (based on grouping together similar jobs see Table 2).

Data analysis.—Content coding, a closely related method to the thematic analysis, was used to analyze the data (Hsieh & Shannon, 2005; Neuendorf, 2016) across five major areas: how important SV/IPV were as issues to people living in town, where prevention currently happened, whether SV/IPV prevention was on the radar of town leaders, level of community awareness of SV/IPV, and how and where SV/IPV prevention needs to happen in their community. Content coding was selected given the more specific interview questions in this area of the study that were the basis of manifest concepts and categories related to community readiness and that could be applied across time points (Vaismoradi & Snelgrove, 2019). The research team wanted to be able to tally the presence or absence of these categories to compare phase 1 data to that collected in phase 3 after implementation. A pair of researchers conducted initial open coding, and over time more specific codes were grouped into higher-order categories through a discussion and consensus process (similar to the thematic analysis processes). To compare towns over time, an added level of applying all codes to each interview was applied with 90% coding agreement. For a second round of coding, towns were separated according to GDC and comparison and baseline and follow-up, and tallies of coding responses were created and compared descriptively by the first and fourth authors.

Connecting and Diagnosing Results.—Analysis of baseline interviews, and comparison to coding from phase 3 interviews revealed interesting information about variability among towns in aspects of community prevention readiness.

Are Sexual and Intimate Partner Violence Important Issues?.—Around three quarters of participants expressed that sexual and relationship violence are important issues in town at baseline before GDC (73.7% in both GDC towns and comparison towns). At follow-up, interviewees reported issue importance at even higher percentages (85% in GDC towns and 87% in comparison towns). At baseline, between 32 and 37% of comparison and GDC town participants, respectively, believed that there were different "front burner issues" for their community rather than sexual and relationship violence. Participants expressed that this prevention in communities must compete for attention with a variety of other key concerns, especially poverty and substance abuse. As one town leader expressed at follow-up,

> "I think there are a lot of priorities in this community, and while that is an important topic, I'm not sure that it rises to the level of the top priorities in this particular community. I think there are other issues that are probably ahead of that one, of those two."

Where Prevention Currently Happens.—The majority of key informants in both towns and at both time points were aware of prevention work (at year 1, 63% in GDC towns and 68% in comparison towns; at year 4, 54% in GDC towns and 80% in comparison towns). At both baseline and follow-up interviews there was nearly unanimous agreement across all four towns that sexual and relationship violence were talked about in certain professional circles, but that diffusion across the general citizen population was lacking (74% in GDC towns and 84% in comparison towns at baseline; 100% of interviewees in both GDC and comparison towns at follow-up). There was also consistency across time (89% at year 1 and 77% at follow-up in GDC towns; 66% at year 1 and 60% at follow-up in comparison towns) that crisis centers were a key local site for prevention work. Between 40 and 60% of interviewees across towns and time points also noted that there was collaboration on prevention issues across organizations.

Improving Feasibility: Where Does Prevention Need to Happen?.—Key Informant interviews provided data about where prevention should take place. There was consistency across time and towns in feeling that schools were the best location for SV/IPV prevention, although this response decreased for all towns (from 79% in GDC towns and 95% in comparison towns at baseline to 69% in GDC towns and 73% in comparison towns at follow-up). Participants suggested other prevention settings, such as recreational or leisure community spaces, other service agencies (e.g., mental health), crisis centers, or police. For all towns, these percentages increased from baseline to follow-up.

At baseline, a majority of interviewees in all towns suggested that change should be led by a lead organization and to start first with institutions like schools (responses ranged across towns from 53 to 68%), and, to a lesser degree, by members of the community sharing their personal stories (in both cases, 21%). However, at follow-up, percentages for both lead organizations (0–13%) and use of personal stories (0–8%) was much lower in each town and did not reach 50% in any town. At follow-up, interviewees from both GDC and comparison towns pointed out that change should start by offering prevention education at all ages in schools and agencies. There were far more responses in the "other" category across towns

in year four with some differences in these more individualized responses. Matched towns talked more about prosecution and catching perpetrators while GDC towns talked more about interconnected prevention and trainings.

Phase 2: Planning and Implementation Including Acceptability and Feasibility

Steering Committee Interviews.—A total of 10 key informants were recruited from lists of contacts provided by the two rape crisis centers that were in the GDC-exposed towns, which included past and present steering committee members and community members who expressed interest but never formally joined the committee. Each SV/IPV crisis center generated between 9 and 15 names of potential participants. Interviews lasted between 30 and 45 minutes. All participants received a US$20 Amazon gift card electronically for their participation and were debriefed about the study and next steps for GDC in their town. Eight participants were from one GDC town; two participants were from the other GDC town (an overall response rate of 42%). While demographic information was not gathered given IRB prohibitions against reporting identifiable information for such small samples, their relationship to GDC throughout the project was noted. Participants were involved for an average of 2.1 years with GDC (SD = 1.2), ranging from 1 month to 4 years. Six participants were still involved with GDC at the time of the interview, and four had stepped back from involvement. The interviews were semi-structured and asked participants about their role with GDC, what made them want to get involved (or challenged their ability to get involved), what they felt the steering committee accomplished, and what advice they would offer to make the committee more successful. All interviews except two were recorded using online meeting software and transcribed using the transcription service rev.com. Due to technical difficulties, two interviews were not recorded; instead, the interviewer took detailed verbatim notes which were used in later analyses.

Monthly Check-in Calls With Implementing Agency.—During program implementation, periodic check-in calls (on average every 2 months) were made to each of the two crisis centers at the center of GDC implementation. Twenty-four check-ins were completed over a 2-year period, starting in November 2016 and ending in October 2018 (N = 14 for Town 1 and N = 10 for Town 2). With the exception of two that were conducted in person, all check-in interviews were conducted over the phone, typically with the paid staff responsible for GDC programming and the crisis center director (no demographics were gathered due to concerns about identifiable data). The interviewer made detailed notes of the conversation and recorded specific GDC activities for each month of implementation. Each check-in call included questions such as specific GDC activities implemented, and details of resources used and descriptions of challenges and benefits encountered.

Data Analysis.—The content from the steering interviews and the check-in calls was analyzed and integrated using a thematic analysis given the descriptive aims and the desire to emphasize context and broader patterns in the data (Vaismoradi et al., 2013; Vaismoradi & Snelgrove, 2019). In the coding process, researchers identified themes derived from the text and analyzed the relationship among the themes to identify patterns both within and across participants' experiences and perspectives with implementing GDC. Initial themes were reviewed and defined with more precision including the identification of key examples

and quotes. Over time, the research team identified repeating key themes, suggesting that saturation in the data was achieved.

Planning and Implementation Results.—Thematic analysis identified two key themes related to positive feasibility and acceptability of the program. Fourteen themes emerged related to challenges to successful implementation outcomes; after further discussion, these were grouped into three different thematic categories: curriculum-related challenges, process-related challenges, and resource-related challenges.

Positive Implementation Outcomes.—Participants described two key positive outcomes and processes of GDC: community partnerships and visibility of and energy for SV/IPV prevention. Participants, particularly in the steering committee interviews, described how the project engaged key influential community members and created new community partnerships between organizations and individuals who did not usually work together. One crisis center member remarked, “Community partnerships is the big thing these past few months. In the short-term without doing any launches or trainings, it is great to see the relationships with the community partners.” Creating these connections is not always easy, but the project created spaces for important dialogues, as a crisis center member noted:

> “Some of those groups were really tough and asked really pointed questions. A lot of these trainings are with people who don’t necessarily already agree with the message of Green Dot and what anti-violence work is about. And we were able to overcome that ignorance and also sometimes disagreement and convince them to think about how important this is and to listen to this work.”

Steering committee members also noted how the project created more visibility for SV/IPV prevention. There were several sub-categories identified, including the reach of prevention messages, the activation of social media, and ways the training created excitement by helping people in town see the possibility and power of taking action. One steering committee member noted,

> “It didn’t take long for people… who were not affiliated with the crisis center, to be mentioning Green Dot in the community. You really had this feeling of the message is getting to where it needs to be. People are learning about this. People are understanding. [I am] starting to see the Green Dot and stickers at area businesses.”

A crisis center member noted, “GD has been really good at capturing people’s interest in the issue and making it seem that it is realistic and in our grasp. This feels different, and it got more people’s attention. It got more people around the table involved. Local businesses, to local service organizations to municipality—a lot of people’s attention.”

Implementation Challenges.—Curriculum-related challenges and solutions included topics that referred to specific technical assistance needs for program implementation, particularly during the start-up phase of the project. Communities wanted more guidance from the program developer, more specific tools for building and sustaining community partnerships, a timeline for community-building actions, and ways to assess and tailor potential volunteer roles (with varying levels of commitment and time required). Indeed,

the time required to become a fully-approved trainer (4-day training followed by 8+ hours of practice to be "approved") was the single most cited challenge to the feasibility and acceptability of GDC. Solutions included recruiting people with specific skills for different roles and better anticipating how much time different activities would take to plan and carry out.

Process-related challenges and solutions included topics that dealt with the underlying theory or approach of the intervention, both on an abstract level and in terms of implementing certain strategies. Many themes that arose are typical of any community mobilization effort, such as a lack of volunteers with necessary skill sets or even a lack of awareness about what sorts of skills are needed as one coordinator mentioned wanting "some kind of org chart or infographic of the types of people and skills that you need to launch Green Dot Community." Low event attendance despite extensive marketing was also a problem, such as when "people register for trainings and then do not actually attend them." Participants also noted the need to start assessing the community earlier to identify how new prevention efforts could best connect with existing locations and events, "[GDC] needs to meet the people of [Town] where they are at. A specific example is that it is a lot to ask a person to go to 5-hour training when they work a full-time job in order to make ends meet. A one-size-fits-all approach is not the best way to work with different kinds of communities." Greater assistance with sustainable community partnership building that does not rely on single champions was also a key frustration, "on the city-front…the level of participation and investment. They lost the champion about this work (the former chief of police who passed away last year) and so far they have not found another insider who has connections and a position within the city government who can champion Green Dot and this work." During the project, participants described pivoting to address challenges by hiring staff with GDC-related skill sets (e.g., oral presentation skills, community organizing skills), flexibly designing and adapting prevention events, and making future plans to extend the GDC work to other regional communities with close ties to the participating towns.

Resource-related challenges focused on themes like a lack of sufficient funding to pay for GDC staff time, turn-over of GDC-trained staff, and technical assistance needs to define various project roles. Volunteer attrition was a challenge to implementation as noted several times in monthly check-ins,

> "It is hard for volunteers to juggle being leaders on this work and also to get their own work done but they are also then being asked to reach out and recruit other people which is labor intensive and takes a lot of work and that is burning people out."

Lack of a central coordinator for all of the GDC endeavors in GDC towns was seen as contributing to both abstract planning frustrations, "a full staff person [would] really make a huge difference. So many moving parts, it is too hard for multiple people to stay on top of it all" and morale frustrations, "a single coordinator, but maybe it would have created more of a base or a stronger relationship network. So maybe the turn-over is something to consider and think about how that impacts the work and the amount of the work that needs to be done." Overall, community-building prevention is a very time- and resource-intensive approach and communities need to anticipate this when allocating resources for prevention.

Phase 3: Evaluation—Impact and Diffusion Assessment

Perceptions of Green Dot Community by Community Leaders at Phase 3.—At follow-up, 85% of GDC town interviewees mentioned that they knew about GDC, with responses indicating a wide variety of knowledge and involvement in the program. Nearly half of the interviewees (45.5%) reported significant involvement, being trainers or taking part in the training; the other half (54.5%) had heard about GDC without being involved in the front line. This latter group was aware of GDC because they worked in an agency that promoted the program, helped with data collection at schools, or had a basic notion about it. Two of these latter cases (33.3%) pointed out that they did not engage in training due to time limitations and not seeing implications to their current work.

The positive impact of GDC implementation obtained in this set of qualitative data (from participants who were not on the steering committee) conveys similar themes about the helpful framing of prevention as a broad community issue, and the linkages between organizations that GDC created. One participant remarked,

> "I've seen real cross-sections of the population… You know people are using the Green Dot on their letterheads and on their signatures on their emails and have it on bumper stickers on their cars, and as more and more people go through the training there's more of this community understanding of what I can do to be proactive in making things better in town."

Key community leaders expressed awareness of GDC and seemed knowledgeable and enthusiastic about its goals, data supporting the acceptability of GDC.

Quantitative data was obtained with and matched comparison community panel study with one survey in each of the three phases of the MMR design.

Surveys.—Participants (N = 1700 at Time 1, N = 1743 at Time 2, and N = 1659 at Time 3) were equally distributed across a sample of four towns. It was a community panel design because at each time point, the communities were the same, but the samples of adults within towns were independent. Leaders of the local crisis centers in two communities volunteered to convene a steering committee of community members to work with the national non-profit that implemented GDC, and the two other communities were approached because they were demographically similar (in terms of population size and income) to the two GDC communities. Only included towns that participated in the CDC's Youth Risk Behavior Survey (YRBS) and had a crisis center interested in partnering with us on the project were approached. None were neighboring communities, though three of them occupied a similar region of northern New England. Using the White House Office of Management and Budget (2010) criteria that defines "rural" as population less than 50,000, all four towns were rural (see Banyard et al. (2020) for more details on recruitment). Table 3 presents sample demographics.

While samples from each town were drawn to be representative of those towns, there were demographic differences between the towns on age and income consistently at each time point (there were not significant demographic differences within town across time points, suggesting consistent independent samples within towns at each of the three survey time

points). Age and income were used as control variables in analyses reported. The samples from the two GDC towns were on average older and of lower income than the comparison towns.

Procedures.—A modified Dillman method was used to direct mail households in four towns (Dillman et al., 2014). A total of five mailings were sent over 3 months to a representative sample of households from each community (N = 7921) (selected using address-based sampling from the US Postal Service's Computerized Delivery Sequence File, excluding traditional PO boxes, highway contract, seasonal, vacant, drops, and educational addresses). The first, second, and fourth mailing waves included a cover letter survey invitation/consent form, a survey packet, and a postage-paid return envelope. The first mailing wave also included a US$1 bill incentive. The third and fifth mailing wave included only a reminder postcard about the survey.

Measures.—All attitude measures used a similar response scale and are described in more detail in the Supplemental Appendix. The survey used the same items across each survey phase, with the exception that surveys 2 and 3 included questions about exposure to Green Dot Community messages and trainings. The constructs measured were collective efficacy, injunctive and descriptive social norms, and bystander prevention actions.

Data Analysis.—After identifying significant differences in both age and income levels within the four towns over time, adjusted regression analyses were performed for treatment-level group comparisons. Perceptions of community-level norms were analyzed using ANCOVAs and multivariable linear regression models with predictors including: town or treatment group indicators, age (as continuous), income level (as five ordinal brackets), follow-up time variables (T2, T3), and interaction terms for each town or treatment group indicator and the specific follow-up time variables. Separate multivariable logistic regression models with the same predictor set were employed to examine the dichotomized bystander opportunities and the proactive and reactive bystander action among those with opportunity. Adjusted odds ratios with corresponding 95% confidence intervals were calculated for these outcomes based on the logistic regression models. To examine the effect of GDC exposure on the outcomes in the treatment towns, additional single time point (T2 and T3) multivariable linear (for collective efficacy and norms) and logistic (for bystander opportunity and action) models were fit that also included a GDC exposure indicator variable in addition to the town indicator (1 or 4 only), age, and income level measures. All statistical analyses were done in R (R Core Team, 2019) using two-sided tests with a p-value threshold of 0.05 to determine statistical significance.

Evaluation Results

Prevention Impact Across Towns (Hypothesis 1).—There were no significant GDC by time interactions across towns (analyzed as two groups representing GDC or comparison) on any of the attitude measures (collective efficacy, injunctive, and descriptive norms). Social norms indicators remained largely steady across towns over time. Logistic regressions also showed no significant interactions of GDC by time for any of the six reactive bystander behaviors.

Prevention Impact Within Towns (Hypothesis 2).—Consistent with previous work, quantitative data were used to examine differences between community members who were exposed to GDC versus those who were not (Coker et al., 2011). This is one indicator of adoption of innovation and implementation impact (Rogers, 2002). In Town 1 (an intervention town), 31.1% of participants in the time 2 panel indicated GDC awareness, as did 28.6% of participants in the time 3 panel. Participants in town 4 (the second intervention town) reported 19.4% aware and exposed to GDC at time 2 and 17.2% at time 3.

Taken together, participants from GDC towns who said they knew about GDC initiatives self-reported significantly better community social process attitudes compared to those who did not (see Table 4). Participants who were aware of GDC reported significantly higher scores on perceptions of collective efficacy and three social norms measures (all small effect sizes based on R^2/Cohen's f^2), and the proactive bystander behaviors (a large effect). There were no differences for the reactive bystander behavior measures and thus they are not presented here.

Key Informant Interviews—Does Community Readiness Change?.—The key informant interviews also contained some information about impact and diffusion.

Is Prevention on the Radar of Town Leaders?.—In GDC towns, 32% of interviewees at baseline said that sexual and relationship violence prevention was not really on the radar of town leadership. This declined to 23% of interviewees at follow-up. In comparison towns, 16% at baseline said these issues were not on leadership's radar; this increased to 27% at follow-up. Given that different key informants did interviews at baseline and follow-up, declines for GDC towns may reflect individual differences; however, this decrease for GDC towns is consistent with GDC prevention-related activities. Further, many interviewees (between 33 and 68% across the four towns) indicated that community leaders showed support for SV/IPV prevention through working with organizations to support their initiatives and financial support. These percentages were consistent across time and towns but did show a wide range of perceptions that might benefit from future research.

Level of Community Awareness of Sexual/Intimate Partner Violence.—Regarding participants' perceptions of whether people talk somewhat more about SV/IPV, interviewees from GDC towns showed an increase across time (21% at baseline and 69% at follow-up), while for comparison towns a slight decrease was obtained (53% at baseline to 47% at follow-up). One GDC town interviewee remarked,

> "I think there's far more communication and talk about it. There's more community group meetings where it's part of the conversation. The agencies that are very invested in this and have connected and have collaborations with other community agencies and the school systems. I think they put it as a top priority."

Regarding lack of awareness, at baseline, 63% of participants from GDC towns perceived that people from their town were overall unaware of services and prevention activities, in comparison with 42% of interviewed leaders in comparison towns. However, at follow-up, fewer leaders in GDC towns perceived a lack of awareness among town citizens, while the percentage of comparison town leaders who saw problems with awareness slightly

increased (23% and 47%, respectively). Across all four towns, participants shared examples of prevention awareness, including work in schools, fundraisers and public events, and news and social media. Interestingly, perceptions of reports in the news and social media increased from 37% at baseline to 46% at follow-up for interviewees in GDC towns. By contrast, in comparison towns, mention of this form of awareness decreased from 68% at baseline to 47% at follow-up.

Phase 4: Dissemination

The data produced by MMR in this project provided a rich source of information and findings to bring back to the community. After each phase of data collection, a series of brief community reports were prepared and provided to the community. At the end of the project, another series of reports were produced and placed on the project website. These were more integrative reports that could be accessed by any community member interested in the results of the project. Further, members of the research team and the practice implementation team worked together to produce a white paper and a podcast of lessons learned. The integration of qualitative and quantitative findings gave GDC communities a sense of the challenges and limitations of the program as it was implemented but also showcased its promise and communities indicated their intent to revise the program and keep trying to sustain it.

Results Integration and Dissemination

Table 5 presents a joint display of the integrated mixed methods findings used in the current study. We assessed fit by comparing themes related to feasibility and impact across the phases and methods used (see Figure 1). There were several important areas of convergence and divergence regarding the three study aims: feasibility, diffusion, and impact on attitudes and behaviors. The integration of these insights illustrates the importance of community-engaged MMR that blends interventionist with community-based designs.

In terms of impact, there was data convergence across several methods. Quantitative survey analyses for hypothesis 1, the overall outcome by town, did not show changes on key attitudes or prevention behaviors over time among individual adults in prevention towns compared to matched comparison towns. This converged with the qualitative process note evaluation which demonstrated challenges of prevention implementation, and the key informant interviews, which documented variability within as well as between towns in how leaders frame prevention priorities and spaces. Qualitative data sources converged with the null survey findings by painting a picture of communities as settings with limited resources for addressing many competing prevention and response needs. The qualitative data helped unpack potential reasons for the null overall quantitative findings by describing multiple implementation barriers, including staff resources and the need for more foundational community assessment, as well as a longer timeline to show potential prevention effects. On the other hand, findings diverged in the more preliminary level of impact assessment (hypothesis 2 from survey data). In this case, Green Dot Community-exposed adults compared to non-exposed adults within just the prevention towns perceived community social processes more positively.

In terms of feasibility, the mixed methods findings diverged. The quantitative data showed that awareness and engagement with the program went beyond innovators and early adopters and into the early majority (Rogers, 2002), with 25–33% of participants in prevention towns reporting exposure. This suggests feasible diffusion during the two implementation years. Qualitative interviews with implementers, however, stressed many challenges that interfered with feasibility, including the need for more resources, more time for community-building, and the need to rely so much on volunteer time for the project. The use of mixed methods helped paint a contrasting picture of both the promise of community-building prevention, and specific challenges that communities will need to plan for and overcome to be successful.

In terms of adoption and diffusion, there were important areas of convergence. The quantitative data showed better attitudes among those who were aware of GDC within the prevention towns, though the cross-sectional nature of the data prohibits causal inferences. The qualitative data converged with this; key informants in prevention towns noted that GDC was a helpful community approach, and steering interviews and process check-ins described many program strengths and a desire to keep moving forward with its implementation. Community leaders noted ways they felt GDC benefitted their town. The rich variety of data resulted in several avenues for dissemination jointly between the research team and community partners.

Discussion

Empirical Findings

The mixed methods approach using critical realism and dialectical pluralism frameworks helped us to move beyond a solely outcome-focused quantitative evaluation of the program to understand processes—or why GDC unfolded as it did in towns. This allowed us to capture key contextual factors rather than seeing evaluation as linear (including examining different perspectives and relationships) (Allana & Clark, 2018; Shannon-Baker, 2016). The question “does it work?” was not the most important aspect of the project. This lens produced results that failed to support the hypothesis that Green Dot Community would change adult community members’ perceptions of collective efficacy, social norms, and bystander behavior compared to adults in comparison towns. However, within the prevention towns, those exposed to Green Dot Community perceived more supportive norms and collective efficacy than those not exposed (though the cross sectional nature of this data prohibited drawing conclusions on causality). The collection of mixed methodological data allowed us to start to answer these implementation questions related to feasibility, acceptability, and diffusion simultaneous to the outcome questions.

Indeed, mixed methods findings from the current study provide important insights and lessons for the implementation of community-building SV/IPV prevention strategies such as GDC. GDC may be an approach that could complement other prevention efforts that focus more on schools and youth. To actualize its potential, more attention needs to be paid to both professional and volunteer resources that are necessary for implementation and to building in a longer timeline for community assessment and coalition building between systems and organizations within towns. This is particularly important given that community engagement

around violence prevention can spark a myriad of complicated conversations and potential challenges that may require additional attention and support (e.g., addressing harmful myths about violence, responding to disclosures of violence that could increase vulnerability to labeling and stigmatization, managing diverse viewpoints, and social norms related to dating and sexuality).

Further, moving from bounded spaces of schools to the larger and more populated spaces of towns, future research is needed to document the time that it takes for messaging associated with Green Dot and similar prevention programs to spread so that prevention continues to diffuse over time. Diffusion is likely much quicker in schools, in which you may have 500–2000 students, compared to communities with 13,000–25,000 citizens and may also require less prevention messaging/events than in community spaces which include individuals who are diverse in variables like age. Chan et al. (2016) describe it as "succession" and discuss the importance of seeing violence prevention less as one-time strategies and more longitudinally. This is particularly important for trying to change community-level processes, where mesosystem relationships (e.g., how well the crisis center director knows faith-based or business leaders) may be needed to build the exosystem linkages (e.g., links between banks or the chamber of commerce and the crisis center) for meaningful change (i.e., violence reductions) to occur. Across all towns, there was a relatively high level of expressed community readiness to address SV/IPV in the qualitative data. There were also many other competing social problems. The mixed methods research approach helped us better understand that community readiness itself may not be the best model for framing community-based prevention. Rather, models of implementation science that describe the needed technical assistance and resources for overcoming barriers may be more helpful (Wandersman et al., 2008).

Contributions to the Field of Mixed Methods Research Methodology

Current discussions in MMR agree on the importance of MMR for program evaluation (Fetters & Molina-Azorin, 2020). However, within the MMR field there seem to be relatively separate lines of discussion of the use of MMR for more researcher driven intervention studies (augmenting designs such as randomized controlled trials) and community-based work which is more participatory action in nature. Both of these forms of design are important. However, the current study shows how they may be integrated, to produce a community-engaged design that is more researcher driven than participatory action methods and yet uses mixed methods to include and capture community voices and returns findings to the community. The current study used Badiee et al.'s (2012) adaptation of Stoecker's model for community-based MMR in a multi-phase design that captured qualitative and quantitative data across three phases of implementation of a community-level prevention program. The study illustrated how community-engaged MMR that combines strengths of both researcher-driven methods and community-based participatory designs. The design produced findings that could readily be disseminated back to community partners. Findings did not just show that the program did not have intended outcomes but provided an enhanced view of why that might be the case and highlighted prevention program strengths and community strengths and challenges that better explained the

evaluation findings. The study provides evidence for the importance of integrating different lanes of MMR evaluation research.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix

Abbreviation Glossary

GDC	Green Dot Community, the prevention strategy being evaluated.
SV/IPV	sexual violence/intimate partner violence, the two forms of violence that were the prevention focus.

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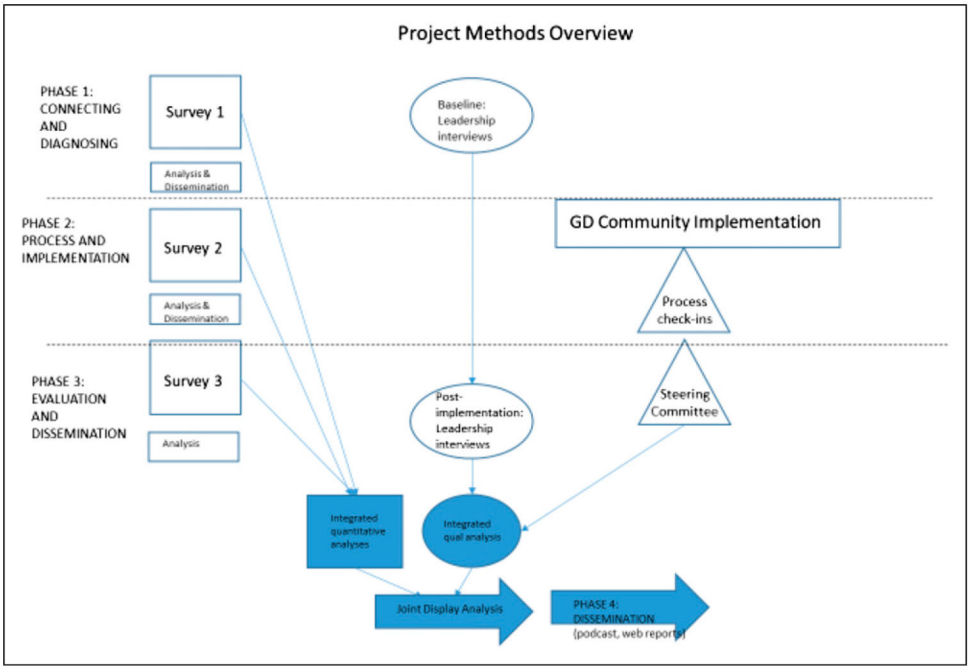

Figure 1.
Multi-phase convergent evaluation design.

Table 1.

Data Collection Across the Multi-Phase Mixed Methods Evaluation Study.

—	Baseline (before)		Implementation (During)		Impact (after)		
Constructs	**Survey 1**	**Interviews**	**Survey 2**	**Monthly check-ins**	**Survey 3**	**Interviews**	**Steering cmt**
Community readiness		X				X	
Collective efficacy	X		X		X		
Social norms	X		X		X		
Bystander action	X		X		X		
Diffusion			X	X	X	X	X
Acceptability					X	X	X
Feasibility				X			X

Table 2.

Interviewees' Demographics for Time 1 and 2.

	Time 1 Towns						Time 2 Towns					
	Baseline Interviews						Follow-up Interviews					
Status	**GDC (*n* = 19)**		**Comparison (*n* = 19)**		**Total (*n* = 38)**		**GDC (*n* = 13)**		**Comparison (*n* = 15)**		**Total (*n* = 28)**	
Gender (*n*, %)												
Male	9	47.4	8	42.1	17	44.7	5	38.5	6	40.0	11	39.3
Female	10	52.6	11	57.9	21	55.3	8	61.5	9	60.0	17	60.7
Age (*M, SD*)	49.4	10.9	48.5	12.9	48.9	11.8	52.9	9.3	54.1	9.8	53.5	9.4
Years worked/lived in town[a] (yrs) (*M, SD*)	10.6	11.9	14.8	12.9	12.6	12.3	23.1	23.9	27.3	16.3	25.3	19.7
Years in job position (*M, SD*)	7.9	7.6	5.5	3.6	6.7	6.0	9.3	6.8	8.5	5.6	8.9	6.1

[a]At Baseline 31 out of 38 both lived and worked in town, at Follow-up only half (13 out of 24) did.

Table 3.

Sample Demographics for Adult Mail Survey at Three Time Points.

	Time 1	Time 2	Time 3	Time 4
Demographic	**%**	**%**	**%**	**%**
Biological sex				
Male	37.2	35.7	36	36.3
Female	61.9	63.5	63.2	62.9
Missing	0.9	0.9	0.8	0.8
Hispanic/Latino				
No	93	90	91.5	91.5
Yes	1.6	2.6	1.9	2.1
Missing	5.4	7.3	6.6	6.4
Race				
American Indian or Native American	0.4	0.6	0.5	0.5
Asian	1.8	0.6	0.5	0.5
Black or African American	0.6	0.9	0.2	0.6
White	93.9	88.9	91	91.3
More than one race	2.4	3.2	3	2.8
Missing	0.9	4.5	3.6	3
Yearly household income				
Less than US$10,000	4.4	4.9	5.5	4.9
US$10,000–20,999	11	8.5	9.5	9.7
US$21,000–30,999	9.8	9.8	9.7	9.8
US$31,000–40,999	8.4	9.5	8.7	8.9
US$41,000–50,999	8.6	7.4	9.5	8.5
US$51,000–75,999	19.8	18	16	18
US$76,000–100,999	12.1	12.9	13.5	12.8
US$101,000–150,999	14.3	12.4	13	13.2
US$151,000 or more	7.6	9	7.9	8.2
Missing	3.9	7.7	6.7	6.1
Age groups				
18–29 years	10.7	10.4	9.8	10.3
30–44 years	15.6	18.4	16.2	16.7
45–64 years	37.4	34.4	32.7	34.8
65+ years	34.9	35	40	36.6
Missing	1.4	1.8	1.4	1.5
Total (*n*)	1700	1743	1659	5102

Table 4.

Self-Reported Green Dot Exposed Versus Not Within Prevention Towns at Time 3 Controlling for Town, Age, and Income (Linear and Logistic Regression) (N = 855).

	B	Se	T Value or OR	P value and 95% CI[12]
Collective efficacy[1] R^2 = .17	.09	.04	2.30	s
Green dot = 1				
Descriptive norms: Community-oriented action[2] R^2 = .08	.23	.05	4.87	<.001
Green dot = 1				
Descriptive norms: Individual-oriented action[3] R^2 = .08	.07	.04	1.60	.11
Green dot = 1				
Injunctive norms: Community public norms[4] R^2 = .04	.13	.05	2.89	.004
Green dot = 1				
Injunctive norms: Community personal norms[5] R^2 = .07	.09	.04	2.22	.03
Green dot = 1				
Did you use social media or texting to show that DV/SA[6] are not Okay?[7]	.62	.19	1.85	.001 [1.27, 2.70]
Green dot = 1				
Did you talk with friends/Family about things you all could do that might help stop DV/SA?[8]	.46	.18	1.58	.012 [1.11, 2.25]
Green dot = 1				
Did you talk with a spiritual or community or educational leader about the importance of violence Prevention?[9]	.54	.22	1.72	.014 [1.11, 2.63]
Green dot = 1				
Did you show your support in some way for the work of a DV/SA crisis Center?[10]	.88	.18	2.40	.00 [1.69, 3.43]
Green dot = 1				
Did you organize or attend an event related to DV/SA awareness, education, or Prevention?[11]	.63	.21	1.88	.003 [1.23, 2.85]
Green dot = 1				

[1] N = 779

[2] N = 761.

[3] N = 757.

[4] N = 780.

[5] N = 780.

[6] Domestic violence/sexual assault.

[7] N = 772.

[8] N = 773.

[9] N = 771.

[10] N = 772.

[11] N = 771.

[12] 95% Confidence Intervals provided only for logistic regression analyses

Table 5.

Integrated Empirical Outcomes of a Multi-Phase Mixed Method Evaluation of Green Dot Community.

Evaluation Question	Quantitative	Qualitative	Meta-inferences
Acceptability	Significant % of sample exposed	Interviews identified key program strengths	Surveys and interviews at time 3 converged to show that GDC was an important prevention innovation for the communities. It promoted community engagement and new prevention partnerships and showed signed of reaching the target prevention audiences (adults in town)
Feasibility and diffusion	25–30% of participants exposed to GDC and those exposed had better prevention attitudes	Interviews identified many barriers and challenges	A set of adults consistent with a level needed for early adopters to diffuse a prevention attitudes innovation was achieved and those adults had better collective efficacy and social norms than those who were not part of GDC. But significant feasibility barriers existed including sustaining volunteers, resourcing leadership roles, and long training length
Attitude and behavior change	No significant time by town effect on key attitudes or behaviors overall	Suggested reasons why hypothesized outcomes were not found	Over time GDC did not seem to change adult prevention behaviors which may be due to not enough time for full GDC implementation and more initial training/resources to promote full community engagement and mobilization was needed. Overall there were preliminary signs that GDC provided benefit to the community and raised awareness and discussions about interpersonal violence. Future studies of a larger number of towns including more implementation resources are needed to better assess GDC impact