Effectiveness of Facebook Groups to Boost Participation in a Parenting Intervention

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Abstract

Although family-based prevention programs have been shown to be effective at reducing adolescent substance use, it is often difficult and costly to recruit and retain parents in programs administered in person. The current study tested whether program engagement and parenting practices could be improved by offering parents in a self-directed family program access to a private Facebook group. Parents of middle school children ($N = 103$) were recruited through paid Facebook ads to a 5-week self-directed teen substance use prevention program to be completed at home together by parents and their children. Two thirds of parents ($N = 72$) were randomly assigned to a moderated private Facebook group that provided a forum for parents in the study to interact with each other, and one third ($N = 31$) were randomized to use the intervention materials without additional support. Relatively few parents participated in the Facebook group and most did not find the experience useful. However, satisfaction with the program assessed 3 months after program completion was high among all parents and most parents engaged with the materials, irrespective of Facebook group assignment. Overall, parents reported significantly lower conflict and more household rules 6 months post-intervention compared to baseline. Parenting practices did not change more among those assigned to the Facebook group than among parents who used the materials on their own. The current findings suggest that providing opportunities for parents to interact online while participating in a self-directed family intervention may not help to increase engagement or improvements in parenting practices, particularly when few parents engage with each other.

Keywords Parenting intervention · Facebook recruiting · Parenting practices · Facebook groups

Family-based preventive programs have been shown to be effective tools in reducing adolescent substance use and other problem behavior (Haggerty et al. 2013; Mason et al. 2003; Spoth et al. 2004; Stormshak and Dishion 2009). It remains difficult, however, to recruit parents to family programs and retain them long enough to complete the required sessions (Axford et al. 2012; Baker et al. 2011; Haggerty et al. 2002; Haggerty et al. 2006) or to maintain retention rates of at least 60% of required sessions and activities to achieve implementation fidelity and maximize the public health impact of parenting programs (Dusenbury et al. 2005; Fagan et al. 2009). In the past decade, as Internet and social media use has become more widespread (Doty and Dworkin 2014; Duggan et al. 2015; Smith and Anderson 2018; Zickuhr and Smith 2012),

online social networking technology has gained potential to improve recruitment for and administration of prevention programs. The current study examined the utility and acceptability of using a private Facebook group to support parents' participation in a self-directed family program to prevent teen drug use and other problem behavior.

Family-focused prevention programs are commonly delivered through a series of meetings or "classes" involving presentation of material by a trained instructor. This group-administered format provides opportunities for questions and answers, problem solving among participants, as well as role play and coaching. However, it is easier to recruit parents to self-directed programs that they can complete at home, in their own time, and on their own schedule (Haggerty et al. 2006; Whittaker and Cowley 2012). For example, in a focus group study of parents of young children, Metzler et al. (2012) found that parents preferred receiving parenting information in a self-guided format, such as written materials, online content, or on television, over in-home visits by a coach or participating in multiweek parenting classes.

Self-directed programs greatly reduce logistical barriers associated with group-administered programs (e.g.,

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transportation, child care, and rigid scheduling; Gross et al. 2001) are inexpensive, flexible, and convenient (Haggerty et al. 2015) and help reduce perceptions of stigma associated with participation in face-to-face prevention (Baggett et al. 2010). Self-directed programs, including those that use printed materials, have been shown to be effective (Bauman et al. 2001; Haggerty et al. 2007). For example, a self-directed version of the Positive Parenting Program (Triple P) showed improvements in child behavior, parent over-reactivity to child conduct problems, and parenting satisfaction after a 10-week intervention delivered via a booklet (Markie-Dadds and Sanders 2006). However, such programs lack the advantages derived from group process and facilitation (e.g., interactive problem solving, role play, peer coaching, and question and answer sessions). Contact with other parents is a commonly cited reason why parents participate in a parenting program (Haggerty et al. 2002; Harachi et al. 1997; Metzler et al. 2012) and may improve parents' experience, which leads to an increase in implementation fidelity, including higher retention, greater participation and satisfaction, and, ultimately, greater improvements in parenting practices, the hypothesized mechanism that creates better youth outcomes. Offering the opportunity to interact online to parents who are using a self-directed family program may provide parents with the benefits of the group process while retaining the convenience, flexibility, and low cost of home administration.

A few intervention studies have utilized social media to boost the effectiveness of prevention programs by providing opportunities for participants to interact with intervention staff or other participants (Laranjo et al. 2014; Love et al. 2016; Maher et al. 2014; Yang 2017), and the evidence is mixed. For example, Cheung et al. (2015) randomized recent tobacco quitters into three groups: groups A and B were able to interact with each other and group moderators on social media platforms WhatsApp and Facebook, respectively; group C received access to cessation counselors with no added social media interaction. Although groups A and B were designed to be equivalent, analyses showed that participants were exposed to more interaction with the moderators and posted more frequently in Group A, and subsequently reported fewer relapses than groups B or C. The authors theorize that greater levels of interactions observed in the WhatsApp groups increased effectiveness of the program, suggesting that the added opportunity to interact with others on social media can be an important booster for prevention programs. Two other intervention studies, however, showed that being enrolled in a Facebook group did not lead to better physical health outcomes compared to the control group (Cavallo et al. 2012; Napolitano et al. 2013), except when combined with booster text messages from staff, again suggesting that higher levels of interaction with other participants and program staff are necessary to boost effectiveness. Other studies, such as an implementation of Triple P Online (TPOL) offered

participants opportunities to interact and report positive feedback but did not explicitly test efficacy of the networking component (Love et al. 2016). Overall, little is yet known about the effectiveness of providing participants with the opportunity to connect to others through social media (Tate et al. 2015). This is particularly true for interventions involving parents. Apart from one small feasibility study where women used an app to connect with others in order to promote physical activity among mothers of young children (Kernot et al. 2014), we are aware of no intervention studies of social networks that involved parents.

To address this gap, the present study tested the feasibility and acceptability of private Facebook groups to support parents who were recruited via Facebook advertisements to use a self-directed family program to reduce teen drug use. The parent curriculum was part of the multicomponent Raising Healthy Children (RHC) intervention previously shown to be effective (Catalano et al. 2003). An advantage of using Facebook (versus creating a new, program-specific platform) is that it is free, ubiquitous, and highly integrated into modern life via access on mobile phones. Almost all parents in the USA use the Internet today and 74% of all Internet-using parents have a Facebook account and most (75%) of them use it daily (Duggan et al. 2015). Facebook groups allow Facebook users to interact with each other online around a shared topic or interest. Facebook groups are useful for research because they can be moderated and made private and confidential by allowing membership by invitation only.

The present pilot study examined the extent to which participation in a study-provided Facebook group was associated with greater improvements in parenting practices than using the intervention materials without additional support. Parenting practices are the proximal mechanisms of the intervention expected to, ultimately, lead to reduced teen drug use. We hypothesized that online social interactions in the Facebook group with other parents using the program materials in a self-guided way would increase engagement (e.g., completion of the chapters, number of activities completed) with the program and lead to greater satisfaction, both of which would enhance the curriculum's ability to improve parenting practices compared to parents who did not have the opportunity to interact online with other parents using the program.

Methods

Participants

Participants were 103 parents of middle school children (grades 6–8) recruited in Washington State and Colorado through paid Facebook ads and peer referrals to participate in a self-directed family program to prevent teen drug use (Oesterle et al. 2018). Almost all (102) were female and all but one lived in Washington State. Most participants were

White ($N = 91$; 3 were Asian American; 9 Native American). Seven participants were Latino or Hispanic. The majority (64%) had completed a 4-year degree, and most lived in a small or medium-size city (58%) or in a large or very large city (29%). All parents completed a baseline survey; 82% ($N = 84$) completed the 3-month and 83% ($N = 85$) the 6-month follow-up survey.

Procedures

Recruitment Participants were recruited in 2015 using paid Facebook ads. To be eligible for the study, participants had to be over age 18, have a child in middle school, live in Washington State or Colorado, and have a Facebook account (for more details on the recruitment process, see Oesterle et al. 2018). Regardless of eligibility, participants were invited to recruit other parents of middle schoolers into the study and were offered $15 if a referred parent agreed to participate. Based on these two recruitment methods, 56 parents were recruited via Facebook ads and 47 were recruited through referrals.

Participants who agreed to participate in the study were emailed a link to the baseline survey hosted on a secure server by the University of Washington. The email link included a personal identification code that linked the baseline and follow-up surveys. Completion of the baseline survey constituted successful recruitment, and once recruited, participants were then mailed a copy of the program booklet to their home. In order to achieve a sufficiently large group size, about two thirds ($N = 72$) of recruited participants were randomized to be invited to join a private Facebook group. The remaining ($N = 31$) did not receive any support from the study to complete the family program. As recruitment occurred on a rolling basis, parents were assigned to a condition when they joined the study based on pre-randomized slots. Approximately 3 and 6 months after the anticipated completion of the program, participants were emailed links to online follow-up surveys. Participants were paid $15 for each completed survey, and an additional $15 if they completed all three. All aspects of the study were approved by the University of Washington Institutional Review Board.

Family Program The *Parenting in the Middle School Years (PIMSY)* program used in the current study was based on the *Stepping up to High School* parenting module of the multi-component *Raising Healthy Children* (RHC) program (Catalano et al. 2003) that has been demonstrated to reduce teen substance use (Hawkins et al. 1999; Hawkins et al. 1992; O'Donnell et al. 1995). The theoretical framework for the program is the social development model (SDM). The SDM posits that individuals are socialized to engage in prosocial (e.g., volunteering) and antisocial behaviors (e.g., drug use and delinquency) by opportunities for prosocial or antisocial interaction in various life domains, including, the family, peers, school, and the community. Opportunities lead to involvement with prosocial or antisocial others, and, if they are rewarding, to social bonding and the adoption of the beliefs of the socializing context. PIMSY encourages parents to monitor their children's whereabouts and interactions, set clear guidelines for behavior, and use consistent discipline to promote healthy prosocial development and prevent teen drug use. PIMSY is a component of an evidence-based program though it has not been tested as a standalone product.

For the current study, we updated images and language in the program manual and added information based on the latest research and concerns regarding the consequences of teen use of marijuana. The resulting PIMSY booklet contained five short chapters and an activity packet, a similar approach to other self-directed interventions (Bauman et al. 2001). The first chapter introduced parents to the social development strategy; the second chapter focused on adolescent development. Chapters 3 through 5 guided parents through maintaining strong bonds with their child, setting clear guidelines for behavior, and solving problems. Each chapter was accompanied by three activities, some of which the parent and child completed together. Activities included watching educational videos on child brain development and completing worksheets to identify values, set goals, and resolve conflict. Parents were encouraged to read one chapter a week and to complete at least one activity per chapter.

Facebook Group A private Facebook group was set up to facilitate completion of the program and allow parents to connect to other parents in the study. The group was monitored by two study staff, one of whom was also the group facilitator who added a new post two to three times a week. The posts included reminders to complete that week's chapter, asking questions such as "What has been your favorite activity or lesson learned so far in the program and why?" and invited conversation by asking how parents approached parenting situations. Parents could comment on the facilitator's posts or create posts of their own. Neither Facebook group assignment nor whether parents joined the Facebook group were related to parent or child demographic characteristics such as education, child age, child gender, or living environment (rural vs. urban), or to parenting behaviors, attitudes toward marijuana, or knowledge of the law. Acceptability of the group was measured through (a) uptake among those who were invited to join and (b) activity in the group once joined.

A moderator and an additional study team member monitored posts in the Facebook group. The moderator initiated conversation by posting open-ended questions (e.g., "Why do you think it's important to show understanding even when you don't agree with your child?"), commented on posts by parents ("I hear you," "good feedback," etc.), and encouraged completion of the program (e.g., "Have you filled out the

Parent Support Check-in on page 18 of your parenting guide?"). In addition, the research team held two live question-and-answer chat sessions on Facebook. Sessions were held about a month apart, during a weekday evening. Chats were advertised about a week ahead via Facebook invites and on the Facebook group page.

Measures

Program Engagement The 3-month follow-up assessed program engagement and satisfaction (Table 2). Parents indicated whether they read or completed each chapter and activity. To measure satisfaction, parents were asked: "Overall, how satisfied were you with the Parenting in the Middle School Years program?" ("very satisfied," "satisfied," "not very satisfied," "not satisfied at all"). Parents were asked whether they would recommend the program to other parents (yes/no) and if they had used the materials since program completion (yes/no).

Program Effectiveness Parenting practices were measured at baseline and at the 6-month follow-up in order to assess whether completion of the PIMSY program improved these practices (Table 1). Items measuring monitoring, conflict, rewards, and consistent discipline are based on the social development model (SDM) and have been validated and used in numerous previous etiological studies testing the SDM theory and evaluating the effect of SDM-based interventions (Epstein et al. 2013; Fleming et al. 2002; Guo et al. 2001; Haggerty et al. 2007; Hawkins et al. 1999; Hawkins et al. 1992) even internationally (Beyers et al. 2004; Hemphill et al. 2011; Oxford et al. 2001). Bonding items are also part of the Communities That Care standardized instrument (Arthur et al. 2002). All parenting constructs have been linked to adolescent substance use initiation and regular use (e.g., Epstein et al. 2013; Hawkins et al. 1992; Hemphill et al. 2011). Parent bonding with child was measured through three items (e.g., How close is your relationship with your child?). Two items measured *monitoring* of child activities (e.g., How many of your child's friend's do you know?). Because of differences in response options, the three bonding items and the two monitoring items were each analyzed separately. *Family conflict* was measured using seven items (alpha = .77), including "Members of my family often criticize each other." *Rewards* for following family rules were measured by six items (alpha = .84; e.g., How often do you praise or reward [child] for following family rules?). Parents were asked whether the family had each of 14 *rules* and expectations for the child, such as eating dinner together, when and how much TV to watch, and whether it was OK to use marijuana. Finally, parents were asked three questions about *consistent discipline* (e.g., How often do you discipline [child] for something and at other times not discipline him/her for the same thing?). Responses were averaged into a composite scale (alpha = .74).

Since the PIMSY program was partially focused on helping parents prevent teen marijuana use in the new context of legalized recreational marijuana use for adults, parents were asked two questions about their *attitudes about teen marijuana use* (e.g., I think it is OK for teens to use marijuana) and three items about their *knowledge of the law* in Washington State and Colorado, such as the legal age of marijuana use.

Qualitative Data from the Facebook Groups Activity from the Facebook group was downloaded and examined for the amount and quality of posts, as well as parent response to each other's and the moderator's activity. An activity log from the Facebook group was downloaded from Facebook and blinded for review. A team of media experts reviewed the group activity and provided feedback about ways that researchers could have better utilized the Facebook forum.

Analysis

We used repeated measures ANOVA and chi-square to test whether there were observed pre-post changes in parenting behaviors, attitudes about marijuana, and knowledge about the marijuana legislation from baseline to 6-month follow-up after participating in PIMSY in the full sample. Intent-to-treat analyses then tested whether change from baseline differed by Facebook group assignment (Table 1). Next, analyses examined whether program engagement and satisfaction were related to Facebook group assignment (Table 2).

Eighty-four participants completed the 3-month follow-up survey (83%) and 85 completed the 6-month follow-up (84%). Participants who did not complete the follow-up surveys did not differ from completers on demographic and baseline measures. Item nonresponse was minimal (< 1%).

Results

Facebook Group Participation and Qualitative Analysis

Of those invited to join the Facebook group, 47 (64%) joined. Overall, participation in the group was low: only a few parents commented on the posts by the facilitator and participants rarely initiated conversations. The moderator posted a total of 150 comments over the course of about 11 weeks; 26 parents (55% of joined) engaged in the group in any way, and of these, only 20 (43%) provided at least one comment; 5 parents (11%) provided 10 or more comments. There was a total of 119 posts (six posts per person on average) or comments by parents, and 184 likes (seven likes per person on average). Very few parents logged in for either of the live chats.

At the 3-month follow-up survey, just over half (57%) of the parents in the Facebook group read posts once a week or more

Table 1 Mean Scores for Parenting Practices and Marijuana Attitudes by Facebook Group Status

Item/Scale	Total (N = 85)		FB group (N = 55)		Materials only (N = 30)		Change from baseline	
	Baseline	6-month follow-up	Baseline	6-month follow-up	Baseline	6-month follow-up	Total	FB vs. Materials only
Bonding								
How close is your relationship with your child?[a]	3.31	3.28	3.38	3.31	3.17	3.23	$F = 0.02$	$F = 0.93$
How well do you get along with your child?[b]	2.72	2.75	2.76	2.78	2.67	2.70	$F = 0.21$	$F = 0.02$
How often does your child share thoughts and feelings with you?[c]	3.96	4.01	4.05	4.04	3.80	3.97	$F = 0.64$	$F = 1.00$
Monitoring								
When your child is away from home, how often do you know where he/she is?[c]	3.46	3.46	3.55	3.49	3.30	3.40	$F = 0.08$	$F = 0.93$
When your child is away from home, how often do you know who he/she is with?[c]	3.89	3.88	3.95	3.89	3.80	3.87	$F = 0.02$	$F = 1.86$
Family conflict								
Conflict scale[d]	1.94	1.84	1.89	1.84	2.02	1.85	$F = 7.28**$	$F = 2.30$
Rewards								
Rewards scale[c]	3.17	3.18	3.24	3.18	3.05	3.18	$F = 0.51$	$F = 3.81+$
Rules								
Number of rules in the family[e]	12.18	12.63	12.27	12.64	12.03	12.63	$F = 4.13*$	$F = 0.25$
Consistent discipline								
Discipline scale[c]	3.98	4.03	4.02	4.06	3.89	3.96	$F = 1.44$	$F = 0.10$
Attitudes about marijuana								
Ok for teens to use marijuana[d]	1.21	1.14	1.18	1.13	1.27	1.17	$F = 1.79$	$F = 0.16$
Teen marijuana use is not harmful[d]	1.39	1.32	1.27	1.29	1.60	1.37	$F = 1.28$	$F = 1.75$
Knowledge of marijuana law								
Number of correct answers[f]	2.13	2.19	2.07	2.25	2.25	2.07	$F = 0.10$	$F = 2.86$

Note: $N = 85$ reflects those of the original sample ($N = 103$) who completed the 6-month follow-up survey. Response options: [a] Extremely close (4) Quite close (3) Somewhat close (2) Not close (1); [b] Very well (3) Moderately well (2) Not well at all (1); [c] Very often (5) Fairly often (4) Sometimes (3) Rarely (2) Never (1); [d] Strongly agree (4) Agree (3) Disagree (2) Strongly disagree (1); [e] Sum of rules in the family (0-14); [f] Sum of correct answers (0-3).

$+ p < .10$

$* p < .05$

$** p < .01$

often and only 10% reported posting something. In open-ended responses, parents expressed that they wished there had been more conversation ("I wish more people would have came and interacted") and more people participating. Parents who did participate seemed to want to discuss topics beyond the program curriculum (e.g., children not getting along with each other), connect with others about everyday issues, and describe their kids. They also expressed concerns about increasing opportunities for their children to engage in problem behaviors (such as spending time with friends who appear to be more knowledgeable about risk taking), especially as they get older, and discussed strategies for enforcing discipline.

The expert team analyzing the qualitative data from the Facebook group posts reported on aspects of the interactions that were successful and found that open-ended questions on specific topics (e.g., discipline) worked best to spur discussion. Other suggestions included setting clear expectations from the beginning of what conversations will be like in the group, allowing for some time at the beginning for parents to get to know one another, taking a temperature of the group when certain moderator posts did not receive a lot of attention, better use of multimedia in posts, supporting and validating posts that raise stigmatizing topics, and ensuring that posts are clear (e.g., no double-headed questions). Experts also noted that the Facebook group may not have been a good forum to hold a chat, which required separate invitations from group membership and was held on a different Facebook page.

Program Engagement and Satisfaction

Overall, engagement with the program was high. Of the 84 participants who completed the 3-month follow-up survey, 62 (76%)

Table 2 Program Completion and Satisfaction by Facebook Group Status

	Total ($N = 84$) N (% within group)	FB group ($N = 47$)	Materials only ($N = 31$)	FB vs. Materials only χ^2 (1)
Program completion				
Completed all five chapters	62 (76%)	39 (71%)	23 (85%)	2.00
Completed all chapters and at least one activity per chapter	51 (61%)	31 (55%)	20 (71%)	2.02
Program satisfaction				
Satisfied with the program	74 (89%)	48 (86%)	26 (96%)	2.13
Would recommend the program materials to other parents	74 (88%)	47 (84%)	27 (96%)	2.78+
Use since program end				
Have used the materials since completion	46 (56%)	30 (55%)	16 (59%)	0.16

$N = 84$ reflects those of the original sample ($n = 103$) who completed the 3-month follow-up survey.

+$p < .10$

read all five chapters of the program booklet and 82 (98%) read at least one chapter. Only two participants (2%) reported that they did not read any of the chapters. Almost all of those who read at least one chapter completed at least one chapter activity (94%); most (82%) completed five or more activities, but few completed all 15 (27%). Fifty-one participants (61%) completed the program as recommended by reading all five chapters and doing at least one activity from each chapter.

Participant satisfaction was also high. Most ($N = 74$; 89%) said they were very satisfied or satisfied with the program, 74 (88%) said they would recommend the materials to other parents, and over half ($N = 46$; 56%) reported using the program in the months after initially completing the program. Almost all agreed ($N = 73$; 91%) that the booklet and activities provided new information, provided an opportunity to spend time with the child ($N = 75$; 93%), gave parents an opportunity to practice new skills ($N = 70$; 88%), brought parent and child closer ($N = 65$; 81%), and educated parents about the marijuana legislation ($N = 68$; 85%) and consequences of marijuana use ($N = 64$; 80%). Fewer agreed that the program helped address a current problem with their child ($N = 39$; 49%) or addressed parents' concerns about drugs and alcohol ($N = 49$; 61%). Over three quarters ($N = 61$; 79%) reported that they enjoyed doing the activities "a lot" or "quite a lot" and all but one participant rated every activity they completed as "very" or "somewhat" useful. Far fewer parents ($N = 29$; 38%) reported that their child enjoyed doing the activities.

Parenting Practices at Baseline

Parents in the study reported high levels of positive parenting practices at baseline (Table 1). For example, 88% of parents ($N = 91$) reported that their relationship with their child was "extremely" or "quite" close. Family conflict was low, with only a quarter ($N = 25$; 24%) of parents reporting that "Members of my family fight a lot." Similarly, parents reported high rates of monitoring, providing rewards for following family rules, and using consistent discipline. When asked about family rules and expectations (e.g., eating dinner together, how much TV to watch), 46 (45%) reported having rules for each of the 14 categories and another 27 (24%) had rules for 12–13 categories.

Parents were disapproving about teens using marijuana at baseline (100% said they "disagree" or "strongly disagree" that it is OK for teens to use marijuana) and believed that even occasional substance use is harmful to teens ($N = 7$; 7% disagreed that occasional marijuana use is harmful). Parents were also quizzed on their knowledge of the marijuana law in their state. Most parents ($N = 82$; 80%) knew the legal age for marijuana use and slightly more than half ($N = 70$; 68%) were able to answer correctly whether homegrown marijuana was legal in their state, and what the legal amount was ($N = 65$; 63%). However, fewer than half ($N = 43$; 42%) were able to answer all three questions correctly.

Change in Parenting Practices at Follow-up

To test the extent to which PIMSY improved parenting practices and marijuana attitudes and knowledge in the short term, baseline levels were compared to levels 6 months later (Table 1). Parents in the full sample reported significantly less family conflict ($p < .01$); the effect size for the change in family conflict was .18 Cohen's d or .06 partial eta squared (Cohen 1969; Richardson 2011; Trusty et al. 2004), indicating

a small to moderate effect. Parents also reported more household rules ($p < .05$), with a small to moderate effect size (partial eta squared = .05, Cohen's $d = .20$). There were no significant changes from baseline in any of the other parenting practices or marijuana attitudes and knowledge.

Program Engagement, Satisfaction, and Change From Baseline in Parenting Practices by Facebook Group Participation

Table 2 compared parents in the Facebook group condition and parents in the materials-only group on program engagement and satisfaction. Parents in the materials-only group were marginally more likely to say that they would recommend the program to other parents than parents in the Facebook group condition ($p < .10$). Comparing the two groups on changes in parenting practices showed that parents in the materials-only group reported a marginal increase in rewards whereas the Facebook group means slightly ($p < .10$) declined from baseline to 6-month follow-up (Table 1).

We conducted a set of secondary analyses to examine whether self-selection into the Facebook group affected changes in parenting practices from baseline. We compared program engagement and change in parenting practices among those who joined the Facebook group, were invited but did not join, and the materials-only group. There were no differences in any of the outcomes when the three groups were compared.

Discussion

Social networking sites like Facebook have the potential to be effective, low-cost tools to support self-delivered implementations of preventive family interventions because social media are free of charge and nearly universally used by today's parents (Duggan et al. 2015; Greenwood et al. 2016). Online discussion forums, such as Facebook groups, may boost the effectiveness of self-delivered programs by adding peer support and peer-learning opportunities. The current study (a) examined the feasibility and acceptability of using a Facebook group to enhance a parenting intervention and (b) tested whether participation in the Facebook group was associated with improved parenting practices compared to self-delivered materials only. Although research suggests that parents would welcome the opportunity to interact with each other (Metzler et al. 2012), a third of parents in this study who were invited to join a Facebook group did not join, and of those who did, only a few participated and none were very actively involved. As a result, we found that Facebook group membership was unrelated to program completion, satisfaction, or effectiveness.

Program completion and satisfaction were universally high. Six months after program completion, program participants reported small to moderate effect sizes in the reduction in family conflict and increasing the number of household rules, both among those who participated in the Facebook group and those who did not. With our sample ($N = 85$ for follow-up analyses), we had 80% power to detect moderate effects (Cohen's $d = .40$ or greater). It would have required a sample of 475 or larger to have 80% power to detect an effect of .20 or smaller. Thus, it is possible that there were other changes in parenting practices that we were not able to detect.

It is worth noting that the current study was not designed as a rigorous test of the program efficacy and did not include a control group and other factors may have explained our findings, including seasonality, as most participants completed the baseline survey in the spring and follow-up in the summer and fall. In addition, the sample was largely made up of educated White mothers living in urban or suburban areas of Washington State and was not representative of Washington State, which is 79% White and 16% rural in population. The high-resource sample may explain the already high levels of family functioning, limiting analyses of change. Finally, it is possible that self-reported measures of engagement are subject to social desirability bias, and other ways of assessing engagement (e.g., content quiz) would better reflect engagement.

The results of this study suggest that further work is needed to understand barriers to joining an online group designed to support the self-delivery of a family program and identify effective strategies for creating online communities in which parents are more actively involved. Although some participants in this study suggested that a larger group, i.e., more than 47 members, would have helped, larger groups may, in fact, not be beneficial as it is easier to remain silent and it can be more difficult to connect. Overall, it may be very difficult to achieve natural engagement using social media with participants who are unfamiliar with each other or are not linked by a strong mutual interest (Duncan et al. 2014; Selby et al. 2010). The challenge for the online group facilitator then is to create opportunities for engagement, model desired behavior, and provide social rewards for involvement, such as by "liking" participants' posts and acknowledging specific contributions, in order to increase group members' skills, trust, and sense of attachment to the group.

Based on the experience gained from the current work and other studies in the field, we suggest the following ways for researchers to increase uptake and participation in social media among participants. First, since a number of participants will not accept a request to join a Facebook group or exhibit little to no engagement once joined (e.g., Merchant et al. 2014), it is important to maximize the delivery of the intervention through an opt-out approach enrolling every participant in the social media condition to a group, instead of waiting for them to accept a request. Second, engagement of

participants by the moderator or other staff has been shown to be important to improve efficacy of social media approaches (Cavallo et al. 2014; Love et al. 2016; Yang 2017). A facilitator can (a) introduce topics for discussion, introduce polls, and ask participants to "like" or comment on the topic; (b) support and validate participation when stigmatizing topics (e.g., parent fears about their children's behavior, difficulties with discipline) are raised; (c) remind participants about confidentiality; and (d) keep encouraging participants to complete the program (Dahl et al. 2016; Hales et al. 2014; Merchant et al. 2014; Pagoto et al. 2016). Third, the use of multimedia, such as sharing photos, cartoons, or videos may also increase engagement and stimulate participation in social media (Pagoto et al. 2016; Stelzner 2017). Gamification of intervention steps, such as earning badges and gold stars for participation can also enhance motivation (Love et al. 2016). Finally, it is important to be thoughtful when "translating" traditional face-to-face approaches into online forms to be consistent with the culture of the particular social media platform and be mindful about how participants use that social media on a regular basis (Pagoto et al. 2016; Vandelanotte and Maher 2015). For example, translating focus group questions to a Facebook online chat format requires consideration of Facebook etiquette, where discussions happening on an appointed day and time are rare. For example, a comment thread that occurs over several days may allow more participants to join the discussion.

The practice of using online tools for intervention recruitment, delivery, and enhancement is still in its infancy. It is possible that in their current forms, many of the approaches to using social media to increase participant engagement do not meet the threshold needed to provide a meaningful experience, because of either low uptake, low-quality interaction, or lack of connectedness sometimes associated with non-face-to-face interactions. As more time is spent online, it is important to continue to explore the Internet's potential for intervention researchers; however, it must be incorporated in a thoughtful way that best reflects the needs of the particular intervention population. Further, online intervention boosters, such as opportunities for study participants to connect with each other online, are effective only to the degree that they are utilized by participants. Overall, internet tools and social media continue to be promising tools for delivery of interventions, although the degree to which social media can indeed boost the effectiveness of programs remains underexplored.

Compliance with Ethical Standards

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