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Online Psychoeducation with Parent Management Training:

Examining the Contribution of Peer Support

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Abstract

Psychoeducation is an empirically based intervention that is increasingly delivered online to individuals and groups. Low participation has been a problem for online designs that include peer support. New technology designs have been called for and, in response, we developed a model that synchronized the delivery of individual and group-based psychoeducational activities for parent management training. We used a problem-based learning strategy delivered to caregivers of youth demonstrating oppositional behaviors to encourage the development of helping processes and peer support. This mixed methods intervention study had high rates of participant retention and positive measurable changes for two of its three psychoeducational outcome measures. When we merged the study data, we observed that mutual aid—a frequently sought goal of group-based interventions—contributed to participant outcomes.

Keywords: groupwork, online psychoeducation, oppositional defiant disorder, online parent management training, peer support, problem-based learning

Online Psychoeducation with Parent Management Training: Examining the Contribution of Peer Support

Parent management training, including on-the-ground and online programs, provides psychoeducation for parents or other caregivers experiencing persistent youth defiance and noncompliance. Meta-analysis demonstrates youth adjustment is 62% to 76% better when parents participate in parent management training (Maughan, Christiansen, Jenson, Olympia, & Clark, 2005). Training results in moderate effects for increased parenting skill effectiveness, increased youth behavioral compliance, and large effects for parenting skills acquisition (Lundahl, Risser, & Lovejoy, 2006). Individual and group-based delivery have similar effectiveness (Fossum et al., 2014; Wymbs et al., 2016). Group-based psychoeducation also enables peer support and its therapeutic benefit of shared experience (Rains & Young, 2009; Yalom, 1995). Shared experience was of central importance to child welfare parents participating in a peer mentor program (Berrick, Young, Cohen, & Anthony 2010).

The importance of parent management training's outcomes derives from Coercion theory (Patterson, Reid, & Dishion, 1992). Coercion theory has demonstrated that when parent-youth conflict consists of persistent, mutually reinforcing cycles of coercion (Shaw & Bell, 1993), a process is set in motion that results in higher levels of adolescent aggression; delinquency; and alcohol, tobacco, and drug use; as well as school failure (Patterson, Reid, & Eddy, 2002). However, participation and retention to on-the-ground parent management training has been limited by logistical barriers like program setting and location (Cunningham, Bremner, & Boyle, 1995), time and day of delivery (Buchanan, 2006), and availability of childcare (Katz et al., 2001). Logistical barriers are further highlighted in the United States by the fact that more than 55 percent of rural areas have no social workers, psychologists or psychiatrists (U.S. Department of Health and Human Services, Health Resources and Services Administration, 2013). Aiken,

Johnson-Motoyama, Davis, Paceley, and Brook (2018) found overcoming logistical barriers was central to engaging child welfare parents in a strengthening-families program.

Overcoming logistical barriers has also been a factor in the growth of online mental health interventions and services (Barak & Grohol, 2011), which—despite its advantages—also creates barriers to participation (Tsai, 2014). Online parent management training and psychoeducation programs that segment peer support from group work can diminish the potential contribution of peer support to the intervention [Anonymous, 2016]. We investigated the contribution of peer support in an online parent management training intervention that included group work delivered through asynchronous discussions. The intervention synchronized facilitator-paced group discussions and individual, web-based, psychoeducation training to influence the emergence of mutual aid in peer-to-peer discussions.

Online social and peer support

Receiving and perceiving oneself to have sufficient social support can improve mental and physical health in the face of stressors (Uchino, 2006). When support is obtained through peers facing similar challenges, shared experience activates social learning responses like self-efficacy appraisals to improve coping (Bandura, 1997). Consequently, peer support has been central to achieving training outcomes in on-the-ground psychoeducation programs (Furr, 2000).

However, when interventions are delivered online, user technology self-efficacy, perceived ease of use, and perceived usefulness limit group participation (Tsai, 2014). For example, videoconferencing technology provides a higher quality of "live" experience but is costlier for users, introduces greater privacy concerns, and requires coordination of synchronous time schedules. Based on a study of participation in a strengthening-families program (Aiken et al., 2018), these delivery characteristics would be barriers to engaging child welfare parents,

Asynchronous social media discussion platforms have proliferated, in part, due to their ability to overcome user technology constraints (Hamm et al., 2013; Whitaker, Stevelink, & Fear, 2017). In addition to 24/7 accessibility, discussion forums are simple and inexpensive to administer and to participate in, and have been especially useful when in-person opportunities are unavailable due to logistical barriers (Barak, Boniel-Nissim, & Suler, 2008a; Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004; O'Leary, Bhattacharya, Munson, Wobbrock, & Pratt, 2017). They are also popular because they are voluntary and participation can be anonymous (Barak, Boniel-Nissim, & Suler, 2008). The fear of social stigma resulting from in-person help-seeking has been associated with user preference for online support groups (DeAndrea, 2015).

Although popular and easy to use, the effectiveness of asynchronous peer support platforms remains inconclusive. For example, a systematic review of parent support groups using asynchronous discussion forums (Niela-Vilén, Axelin, Salanterä, & Melender, 2014) demonstrated satisfaction with the logistical advantages and anonymity offered by the platform, however there was limited evidence for improved parenting skills, self-efficacy, or mental health outcomes (Niela-Vilén et al., 2014). Similarly, a systematic review of online health communities (Eysenbach et al, 2004) found inconclusive evidence for the effectiveness of peer support via asynchronous discussion forums on health outcomes.

Peer support in online psychoeducation

When peer support is included in online psychoeducation programs, delivery often mimics the peer support designs of online health communities, where asynchronous peer-to-peer discussions are voluntary and self-directed. The use of this design for peer support in online psychoeducation programs has had limited effectiveness, in part, due to low participation. For example, Taylor et al. (2008) investigated a hybrid parent management training program that

included individual web-based learning modules integrated with in-person coaching and a voluntary, asynchronous discussion forum. The goal of the discussion forum was "…to approximate the opportunities for interaction that are offered by the group experience" (p. 9). Only a few participants used the discussion forum.

Similar results have been seen in online psychoeducation interventions for alcohol misuse, anxiety, depression, and smoking cessation — usage analytics over a period of more than ten years demonstrated that 90% of peer group participants lurked, rather than contributing to discussions (Mierlo, 2014). Minimal participation in online psychoeducation programs using voluntary, self-directed peer discussion forums was also demonstrated by Cristancho-Lacroix et al. (2015) in an investigation of Alzheimer's caregivers; by Geense et al. (2018) in an investigation of caregivers of children with chronic kidney disease; and by Steed (2005) in an investigation of parenting attachment issues.

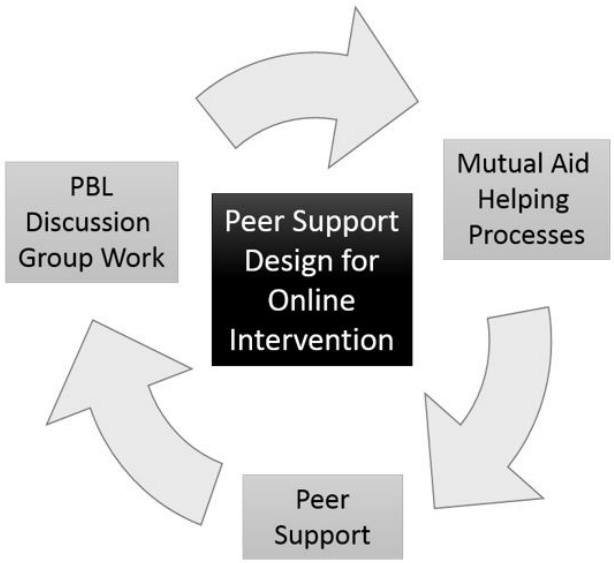
Rethinking the use of asynchronous discussions

O'Leary et al. (2017) identified a lag in the development of technology designs that enable peer support to emerge in online interventions. In the case of voluntary, asynchronous discussion forums, designs must overcome barriers like lurking (van Mierlo, 2014). In contrast, on-the-ground psychoeducation contributes numerous peer support outcomes when helping processes emerge through group interaction. These outcomes include "social learning", "expansion of support and cooperation", "network building", and "normalizing experience" (Lukens & McFarlane, 2004, p. 206). An important consideration from this discussion is how helping processes emerge. Helping processes have been variously identified in on-the-ground interventions as curative factors, such as "universality" in therapeutic groups (Yalom, 1995, p. 5), and mutual aid processes in peer support groups (Gitterman & Schulman, 2005). Examples

of mutual aid helping processes include mutual support, sharing data, advice-giving, advice-seeking, demand for work, and all in the same boat (Steinberg, 2004).

In our view, technology designs for group-based psychoeducation can encourage the emergence of helping processes by facilitating participant discussion via group work. Skills training is a central activity of group-based psychoeducation programs (Furr, 2000), including parent management training (Kaminski, Valle, Filene, & Boyle, 2008). Delivering group work through asynchronous discussions can sequence the presentation of skills training content and organize discussion around central themes. We assume that adopting group work as a design for discussion can support the emergence of mutual aid helping processes where individuals sharing a common problem can improve their coping through an interactive process that includes helping others (Borkman, 1999). This design can be visualized as a cycle that begins with discussion-based group work followed by the emergence of mutual aid helping processes and peer support (Figure 1).

Figure 1. *Peer Support Design for Online Intervention*



Examining the contribution of peer support

Our mixed methods research examined the contribution of peer support for an online parent management training intervention. Group work was delivered through asynchronous discussions. Facilitator-paced peer discussion forums replaced voluntary, self-directed peer discussion forums. A problem-based learning approach, in which participants work together to discover solutions to authentic problems, sequenced group work discussions with individual web-based training. Training addressed parenting self-efficacy, over-reactive or coercive parenting style, and lax parenting style variables. The research tested the following hypotheses:

Hypothesis 1: Caregivers will increase parenting self-efficacy from pretest to posttest.

Hypothesis 2: Caregivers will reduce over-reactive and lax parenting behaviors from pretest to posttest.

Hypothesis 3: Youth will reduce oppositional and defiant behaviors based on caregiver observations from pretest to posttest.

The following exploratory question considered the contribution of the peer support design for online intervention:

Do peer discussions demonstrate characteristics that differ between participants who increase their parenting self-efficacy and those who do not?

Methods

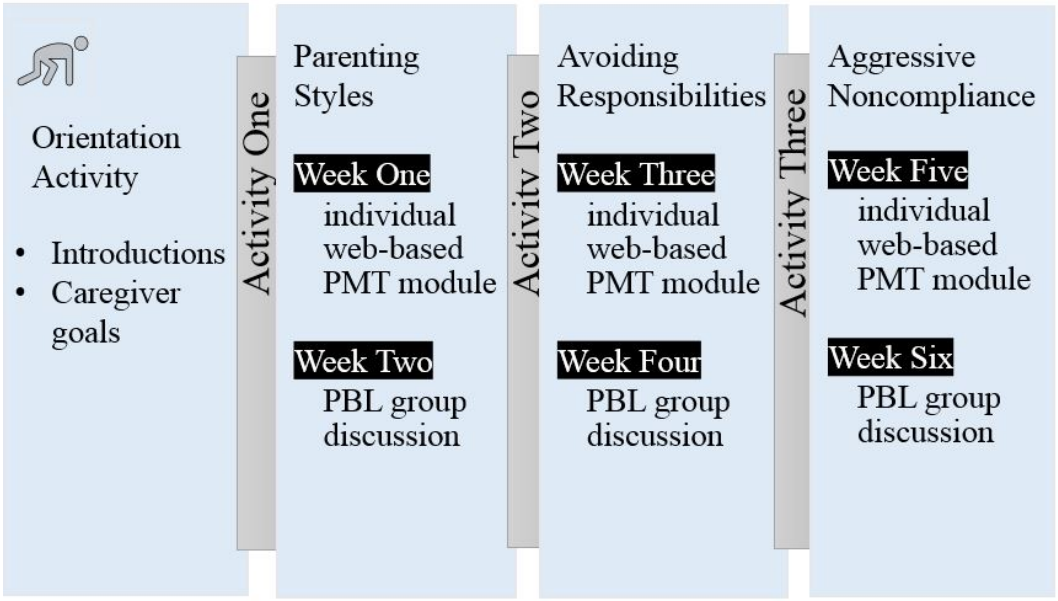
Our research used an intervention mixed methods design (Creswell, 2014) with pretest-posttest data collection. Four groups received the six-week intervention in the following phases (Figure 2):

1) Pre-intervention phase: We contacted participants by telephone; they then viewed an online orientation module and completed an online informed consent, a demographic survey, and intervention pretests.
2) Six-week intervention phase: Participants completed three week-long parent management training modules, alternated with three week-long group discussions.
3) Post-intervention phase: Participants completed intervention posttests.

Intervention

The parent management training intervention delivered during phase 2 consisted of a web-based orientation module, group introductions, three individualized parent management training modules, and three group discussion forums facilitated through a problem-based learning strategy. Participants alternated between reviewing individual web-based parent management training modules and participating in problem-based learning group discussion forums (Figure 2).

Figure 2. *Six-Week Parent Management Training Intervention*



Web-based individual training modules

We used operant conditioning and social learning principles to develop the intervention's web-based training content; multimedia presentations to chunk content into learning objects within the modules to demonstrate principles and strategies; and an assessment activity to introduce each module.

In module one, participants identified their parenting style. We introduced the parenting style construct to participants with an initial self-assessment survey that used a simple parenting style typology that termed authoritative parenting as "balanced", authoritarian parenting as "task-centered" (TC), and permissive parenting as "relationship-focused" (RF). We chose these common-place terms to support participant discussion and prevent embarrassment. The conceptualization identified "balanced" parenting as the joining of task-centered goals of "regulation" with relationship-focused goals of "connection".

In module two, participants assessed their child's level of noncompliance. We used an assessment activity to introduce the module, and participants interacted with a learning object that calculated youth percentage of daily noncompliance. In module three, participants assessed dyadic communication patterns during coercive parent-child interactions.

Each module's learning environment had a consistent appearance and navigation (Conceicao & Lehman, 2013). Interactive multimedia presentations and quizzes provided opportunities for participants to receive feedback and practice and evaluate their understanding of the training concepts. The design aligned learning outcomes, user self-assessments, and instructional materials (Wiggins & McTighe, 2011). Open and end dates were used to facilitate module participation. Module completion led participants to a peer discussion forum. Individual

emails also facilitated participant movement between individual parent management training modules and group discussions.

Facilitated peer discussion forums

Discussion forums used Simple Machines (2017), an open source program that provides password-protected forums for hosting asynchronous discussions. Participants created usernames to maintain their anonymity. A problem-based learning strategy adapted from the Community Parent Education program (COPE) (Cunningham et al., 1998) structured group discussions. In this strategy, participants completed each of the web-based training modules then entered the discussion forum and viewed a brief video vignette of ineffective parenting in response to challenging youth behavior. Participants responded to questions constructed to stimulate critical thinking and the use of information delivered in the web-based training modules to facilitate education and problem-solving.

Data collection

Recruitment

The university's institutional review board approved the research through expedited review. Participants were parents and legal guardians caring for youth between the ages of 10 to 16 years. All participants resided in a midwestern, metropolitan region of the United States whose size and economy rank it as a global city. Recruitment occurred in two stages. The first stage of recruitment was completed through a workplace employee assistance program, which provided assistance, counseling, and benefits to reduce stressors that could interfere with employee work performance. We initiated the second stage of recruitment when the workplace employee assistance program became unavailable. For this stage, we posted fliers in adolescent health clinics and advertisements in a university newsletter.

In addition to access to internet communication, study inclusion criteria included 1) caregiving for youth between 10 to 16 years of age and 2) desire to gain help for behavioral problems of noncompliance. Exclusion criteria included: 1) youth demonstrates risk for harm to themselves or others, 2) youth demonstrates active substance abuse, 3) caregiver seeks training to comply with a court order, and 4) caregiver is participating in another parent management training program.

We used telephone interviews to screen potential participants. Eligible participants followed a link to the research intervention site and viewed a brief presentation of the nature of the research intervention. Participants next viewed the informed consent, which was available for download. Those who wanted to continue in the study completed an online pre-intervention survey. The survey included demographic information and three standardized scales. Upon completing the pre-intervention survey, participants received a link and password to access an initial discussion forum for introductions and identification of individual goals for participation.

Measurement

Three pretest and posttest measures were used: the Parenting Scale Adolescent Version (PS-AV) (Irvine, Biglan, Smolkowski, & Ary, 1999), the Parenting Self-Agency Measure (PSAM) (Dumka, Stoerzinger, Jackson, & Roosa, 1996), and the Evidence-Based Questions for Assessing Likelihood of Meeting DSM-IV Criteria for Oppositional Defiant Disorder (ODD) (Angold & Costello, 1996).

Parenting Scale-Adolescent Version (PS-AV)

The PS-AV has psychometric properties, which support its validity and reliability (Irvine et al., 1999). Exploratory factor analysis of the PS-AV provided two factors, “over-reactivity” and “laxness”, which had factorial validity that was supported by the scree plot, eigenvalues, and

factor loadings. Consequently, the PS-AV includes two subscales that measure parenting style: 1) over-reactive/coercive parenting (OVER, 6 items) and 2) inconsistent parenting (LAX, 6 items). Evidence of convergent construct validity for the OVER subscale was found via moderate, statistically significant, positive correlations with externalizing, attention problems, aggressive behavior, and other measures. Likewise, the LAX factor also showed evidence of convergent construct validity by weak, positive correlations with depression and other relevant variables. Based on the study's sample, we calculated Cronbach's alphas and found them to be adequate: total scale (pretest= 0.83; posttest= 0.86), OVER (pretest= 0.71; posttest= 0.69), LAX (pretest= .85; posttest= 0.89). We calculated a summary score for each subscale for use in analysis.

Parenting Self-Agency Measure (PSAM)

The PSAM measures general sense parenting self-efficacy that is not specific to parenting tasks (e.g., helping with schoolwork). We chose this domain-general measure because scale items are more appropriate for parents of early adolescents, whereas many domain-specific, task-based questions are more specific to children. We also selected the PSAM for its psychometric properties (Dumka et al., 1996). Confirmatory factor analysis has supported the cross-cultural (Caucasians and Mexican immigrants) factorial validity of the PSAM via adequate comparative fit index statistics and factor loadings. Likewise, Cronbach's alphas for Caucasians and Latino immigrants were 0.70 and 0.68, respectively. The PSAM included five items, and participants rated their level of agreement on a 7-point scale (1= rarely to 7= almost always). Cronbach's alpha for the present study indicated good internal consistency reliability: 0.77 (pretest) and 0.86 (posttest).

Oppositional Defiant Disorder (ODD)

The ODD survey is used to rate youth behavior to measure the likelihood of a diagnosis for Oppositional Defiant Disorder (American Psychiatric Association, 1994). It includes eight items that meet the criteria for ODD diagnostic likelihood dependent upon their duration and frequency of occurrence. We selected this measure because of its theoretical relevance and face validity, as well as empirical support regarding cutoff scores for the ODD diagnosis (Angold & Costello, 1996).

Problem-based learning discussion forum posts

Qualitative data was comprised of discussion posts from the orientation forum and the three problem-based learning group discussion forums. The forums alternated with the individual web-based training modules for each of the four intervention groups. Textual data from participants' contributions to the forums displayed their application of individual web-based content and their engagement in helping processes with group members.

Analysis

We concurrently analyzed quantitative and qualitative data (Creswell, 2014) using SPSS24 and NVivo, respectively. We organized qualitative data analysis with two predetermined main themes to guide coding: 1) participant application of web-based parent management training content and 2) participant demonstration of mutual aid helping processes. Qualitative data familiarization occurred during the intervention through daily reading of participant posting content for the purposes of forum facilitation. After the four group interventions were complete, we reread discussion posts to aggregate ideas, concepts, phrases, and memorable quotes into codes developed from the predetermined main themes (Creswell, 2014).

Merged quantitative and qualitative data analysis

Several methods informed the strategy used to merge data for this study, including extreme case sampling (Caracelli & Greene, 1993; Lee & Greene, 2007), extreme case analysis (Kemper, Stringfield, & Teddie, 2003), and maximum variation (Patton, 1990). Each of these methods compare the upper and lower extremes of a phenomenon to identify commonalities and differences. Patton (1990) recommended maximum variation for analysis with small samples where heterogeneity can be a problem. "Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and [the] central, shared aspects or impacts of a program" (p. 172). Based on these methods, we compared the thematic content of participants demonstrating extremes in PSAM pre- and post-change data during the intervention. We chose the PSAM because it measures parenting self-efficacy, which has been associated with recovery and other positive mental health outcomes in mutual aid groups (Cheung & Sun, 2000; Magura, Cleland, Vogel, Knight, & Laudet, 2007). If no differences in thematic content were present in the posts of those at the variable extremes, we did not judge participation to contribute to participant outcomes. If differences were present, we searched commonalities within upper extremes to consider their influences on intervention outcomes.

Results

Study participants

Four groups of 23 caregivers who were parents or legal guardians of youth between the ages of 10 to 16 consented to participate in the study. Nineteen participants completed the study. Non-completers cited external factors as their reason for leaving the study. There were no differences between completers and non-completers in terms of background information or key variables at pretest. Of the 19 completers, eight were recruited through the employee assistance program and 11 were recruited through fliers posted in adolescent health clinics or

advertisements posted in a university newsletter. More than half (52.6%) of the participants were college graduates and the majority (78.9%) were employed (Table 1).

Table 1: *Demographic Data for Participants Caregivers (N = 19)*

	Mean	SD	Range
Age	43.89	6.71	30 - 59
	Frequency	**Percentage**	
Sex			
Female	15	78.9	
Male	4	21.1	
Ethnicity			
Non-Hispanic, White	15	78.9	
African-American	2	10.5	
Asian-American	2	10.5	
Caretaker's Parenting Relationship			
Biological parent	16	84.2	
Step-parent	1	5.3	
Other relative	1	5.3	
Guardian	1	5.3	
Educational Level			
High school graduate	2	10.5	
1-3 years college	7	36.8	
College graduate	10	52.6	
Employment Status			
Employed	15	78.9	
Homemaker	2	10.5	
Unemployed	1	5.3	
Unable to work	1	5.3	

N = 19

Youth descriptive data

The mean age for youth who were the focus of participants' concerns was 14.16 years. Participants identified more males than females (63.2%) and rated nearly half of all youth as demonstrating educational performance that needed improvement or was failing (47.4%).

Participants identified previous psychosocial treatment for 36.9% of youth and previous medication treatment for 21.1% of youth. (Table 2). The descriptive data for the ODD pretest identified ODD diagnostic likelihood for 57.9% of youth with likelihood decreased to 36.8% at posttest (Table 3).

Table 2: *Demographic Data for Children of Participants*

	Mean	SD	Range
Age	14.16	1.98	10-16
	Frequency	Percentage	
Sex			
Female	7	36.8	
Male	12	63.2	
Educational Performance			
Failing	4	21.1	
Needs improvement	5	26.3	
Average	3	15.8	
Above average	6	31.6	
Outstanding	1	5.3	
Youth Received Previous Psychosocial Treatment			
No	11	57.9	
Yes	7	36.8	
Missing	1	5.3	
Youth Received Medication			
No	14	73.7	
Yes	4	21.1	
Missing	1	5.3	

N = 19

Table 3. *Descriptive Data for Oppositional Defiant Disorder Symptoms and ODD Likelihood*

	Pretest		Posttest	
	Frequency	(%)	Frequency	(%)
Duration items				
None	2	10.5	5	26.3
One item	2	10.5	4	21.1
Two items	15	80.0	10	52.6
ODD Likelihood				
ODD not likely	8	42.1	12	63.2
ODD likely	11	57.9	7	36.8

Survey outcomes

Pretest-posttest multivariate analysis of variance (MANOVA)

Using a Bonferroni adjustment, we completed a pretest-posttest MANOVA to control for type I error (Weinfurt, 1995) associated with pairwise comparisons regarding four dependent variables (parenting self-agency, parenting over-reactivity, parenting laxness, and youth ODD). The sample size of 19 was less than the recommended sample size of 30 for repeated measures ANOVA (Abu-Bader, 2011). The observed power of the pretest-posttest MANOVA was 0.66. The assumption of sphericity did not apply because there were only pretest and posttest measures of the dependent variable (Abu-Bader, 2011). The multivariate tests showed a Pillai's Trace of 0.45 ($F = 3.01$, $p = .05$, partial eta squared = 0.45).

There were statistically significant differences from pretest to posttest on the PSAM and ODD measures (Table 4). At pretest the sample ($N = 19$) had a mean score of 22.74 (standard deviation = 4.77) on the PSAM; however, at posttest there was a statistically significant mean increase to 25.21 (standard deviation = 5.54). The statistically significant increase and effect size from pretest to posttest ($p = .03$, pretest-posttest Hedges's $g = -0.54$; $r_{pretest,posttest} = 0.62$, $p < .01$) shows that the participants moderately increased their degree of belief in their parenting self-efficacy. The ODD measure at pretest had a mean of 4.05 (standard deviation = 2.04); however,

this measure significantly decreased to a mean of 2.63 (standard deviation = 2.22) at posttest ($p <$ .01, pretest-posttest Hedges's $g = 0.75$; $r_{pretest,posttest} = 0.61$, $p < .01$). Hedges's g pretest-posttest effect sizes were calculated from a formula provided by Card (2012) (paired-samples *t*/square root of *N*, p. 97). The statistically significant, moderately large reduction in ODD showed a decreased likelihood of having ODD based on the participants' ratings of their children post-intervention.

Table 4. *Pretest-Posttest MANOVA: Pairwise Comparisons*[a]

Measure	(I) PrePost	(J) PrePost	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
Over	1	2	2.474	1.369	0.087	-0.402	5.349
Lax	1	2	1.263	0.908	0.181	-0.644	3.17
PSAM	1	2	-2.474*	1.044	0.029	-4.667	-0.28
ODD	1	2	1.421*	0.435	0.004	0.508	2.334

Based on estimated marginal means

* The mean difference is significant at the .05 level.

[a]$N = 19$

[b]Adjustment for multiple comparisons: Bonferroni.

Peer group discussion characteristics

We used predetermined themes to develop six major codes. For the theme *"applies parent management training content"* the major codes were "parenting style", "compliance rate", and "stay calm". Discussions demonstrated active use of instructional training content, as in the example of discussions that centered on participants' identification of their parenting style and goals for reduction of over-reactive parenting behaviors. In addition to "parenting style", NVivo's word query tool identified the words "calm" and "stay calm" as some of the most frequently used words or phrases in discussion posts. The code "compliance rate" was also

developed based on posting data that contained participant assessment of behavior challenges, goals, and actions needed to manage those challenges.

For the theme *"mutual aid"* the major codes were "all in the same boat", "mutual support", and "sharing data". Within the context of this intervention, these helping processes operated similarly as in on-the-ground groups and reflected important aspects of shared experience: "I'm not alone —others are like me—we can help each other—it's safe to let others know what I experience". For example, a participant from the third intervention group stated "*It's nice to know that I am at least on the right track. My son makes me question that sometimes*". Table 5 displays exemplar posts for each predetermined theme and major code.

Table 5. *Discussion Themes, Major Codes, and Exemplar Posts*

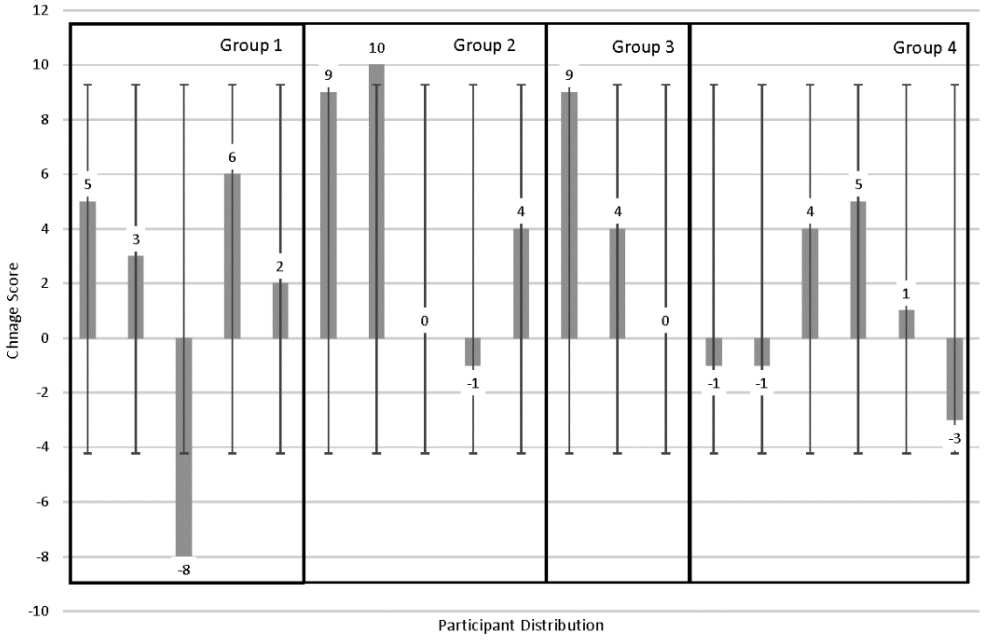
Themes	Major Codes	Exemplar Posts
Applies PMT Content	Parenting Style	My goal is to work on my parenting style to become more balanced. Also, to understand where my emotional trip points are so that I can remain in control. I would rate my parenting style change [goals] an 8 or 9 [on a scale from 1 to 10] (Participant 1st intervention group).
	Compliance Rate	My compliance rate was 33% which is upsetting. My parenting style is TC which is also upsetting. I don't want to think that all I'm doing is wanting my son to complete a task. I want to parent him (Participant 4th intervention group).
	Stay Calm	I also like the idea of speaking softly, yet convincingly. He doesn't usually hear what I'm saying when I'm angry and yelling, anyway. I can almost see him shut down, turn away, and build walls when I'm offensive. On the other hand, when I take the time to acknowledge and compliment his successes (compliant behavior), he lights up and usually seems more invested in being compliant (Participant 3rd intervention group).
Mutual Aid	All-in-the Same-Boat	It's reassuring that other parents are also taking a step back to look at their parenting style with a new awareness of vocal and physical cues they give when confronting their kids. I'm glad I'm not alone! (Participant 3rd intervention group).
	Mutual Support	I really liked the suggestions, and corresponding reflection points, for allowing natural consequences and presenting logical consequences. It makes so much sense, and it seems like a great way to reduce some of

		the stress and reactivity that has become too prominent in my parenting approach (Participant 2nd intervention group).
	Sharing Data	I think…I expect too much and ask for too many things to be fixed at once, instead of putting some kind of order to it. My daughter never really has a chance to do what I shouted for her to do (Participant 3rd intervention group).

Merged qualitative and quantitative data matrix

Plano Clark, Garrett, and Leslie-Pelecky (2010) recommended the use of a matrix as one of three strategies for merging quantitative and qualitative data. The matrix used in this study (Table 6) displays four participants, whose change scores were at extremes above or below the mean change score for the variable of self-agency (PSAM) at post-intervention ($M = 2.52$; $SD = 4.50$).

Table 6. *Participant PSAM Change Score Distribution by Group*



Of the four extreme scores, only one of the four participants represented the lower extreme with a change score of -8. This participant's pre-intervention PSAM score was 17 and the post-

intervention score was 9, indicating a decline in self-efficacy. There was only one instance of thematic content related to the category of mutual aid in this participant's posts. That post identified a hope for the potential for mutual support as a participation outcome. However, unlike participants at the upper extreme, the lower extreme participant did not post any messages that reflected mutual aid processes like "all in the same boat" or "sharing data". In addition, unlike the upper extreme participants, no comments were directed to other group members reflecting application of module content.

Upper extreme participants were more detailed regarding individual parent management training content that included "stay calm" via the use of authoritative communication skills and coping persistence. The upper extreme participants also engaged in more mutual aid posting behaviors, including "all in the same boat", "mutual support", and "sharing data". Their discussion posts included combined themes of *"applies parent management training content"* and *"mutual aid"* (Table 7).

Table 7. *Matrix for Characteristics of Participant Discussion Post Themes at Parenting Self-Agency Upper and Lower Extremes*

Self-Agency Change Scores	Content Analysis Themes	
(M = 2.52) (SD = 4.50)	<u>Applies PMT Module Content</u> *Theme major codes:* Parenting Style Compliance Rate Stay Calm	<u>Mutual Aid</u> *Theme major codes:* All in the Same Boat Mutual Support Sharing Data
Lower Extreme Participant in the 4th group CS = -8	*Parenting Style*: I discovered I use relationship style parenting and that is not working very well. My daughter needs more structure and I need to work on that. *Stay Calm:* Mom was clearly upset and reacted [PBL video vignette]. I love the idea of sending them to their room for both [parent and child] to stop and plan what they are going to say.	*Mutual Support:* I think [program] will help me connect with other parents that are going through the same sort of thing. *No other examples of Mutual Aid processes for participant* *No examples of Combined Themes for participant*
Upper Extreme Participant in the 1st group CS = +10	*Parenting Style:* My goal is to work on my parenting styles to become more balanced. Also, to understand where my emotional trip points are, so that I can remain in control. *Stay Calm:* [a parent] …threatening to break her CD, I believe that only reinforced her destructive behavior [PBL video vignette]. He needed to confront her about her destructive behavior, but not by yelling. I do believe that some form of punishment is appropriate. Something like revoking an allowance until there is enough money to pay for the item that she destroyed.	*All in the Same Boat:* I can see that I am not the only parent having these struggles with my child and the parenting style that I have been using isn't working. We are all having difficulties with our child even though our situations may be different from each other. It helps to see what each parent is struggling with and what they are doing to help resolve the problem.

	Combined Themes - Parenting Style and Sharing Data: I need to remain consistent and continue to work at this because the child/parent relationship isn't going to get any better by giving up!	
Upper Extreme Participant in the 2nd group CS = +9	*Parenting Style:* In fact, I completely agree with [participant's name] point "a good punishment was whatever prevented them from repeating the action." We all knew that punishments are not the goal and they're nothing more than solutions to reach the goal. *Stay Calm*: Staying calm is the first thing we should always keep it in mind. But how can we stay calm when negative things happen and cause negative moods coming from the bottom of our heart?	*Sharing Data:* I am relationship-oriented father. Unfortunately, I am still not getting along with my 16-year-old son. Even though his behavior and grades are not acceptable, but I am not blaming him. I think that something is wrong with me or our parenting. *All in the Same Boat:* As parents, even bad parents, we all wish our kids would become good men/women. We all have the same goal we're trying to reach.
	Combined Themes - Parenting Style and Sharing Data: I really wish my wife and I would do some things the way you guys are doing. Because having kids involved in discussing the punishments is not only making kids really understand what he/she did was wrong but also making the relationship even closer.	
Upper Extreme Participant in the 3rd group CS = +9	*Parenting Style:* My parenting style is "balanced," and I am a low-key, calm parent. I've always tried to respect my son for who he is, but I want him to learn how to become a responsible, self-efficient adult. I'm afraid my "balanced" style of parenting may actually be out of kilter and needs some adjustments! *Compliance Rate:* My compliance rate is right about 50%. I think that's mostly because I am not firm enough with my directions.	*Sharing Data:* To [participant name] - I particularly like your wording "...begin our interactions from a calm, centered place." Somehow that brings it all together for me! *Mutual Support:* I have learned a lot from this last training session and from the suggestions provided by our little forum.
	Combined Themes – Parenting Style, Stay Calm, and All in the Same Boat: It's reassuring that other parents are also taking a step back to look at their parenting style with a new awareness of vocal and physical cues they give when confronting their kids. I'm glad I'm not alone.	

Discussion

This mixed methods intervention study addresses a gap in the development of technology designs that enable peer support to develop and contribute to the outcomes of online psychoeducation interventions. We assumed that a design employing an online problem-based learning strategy to guide discussion could encourage the emergence for the helping processes of mutual aid. These, in turn, would support further critical thinking, reflection, and problem-solving application of training. We predicted our design would result in positive, measurable changes in parenting style, parent self-efficacy, and youth ODD behaviors.

The pretest-posttest MANOVA provides a first dimension for this discussion and supports two of the three hypotheses. There were favorable, moderate, and moderately large changes for increased parent self-efficacy and decreased likelihood of ODD, respectively. The decreased likelihood of ODD behaviors speaks to the clinical significance associated with the intervention, although we caution that these are not necessarily caused by the intervention given the pre-experimental quantitative component of the research design. It is also noteworthy that while null hypotheses for self-efficacy and ODD were rejected, they were not rejected for parenting styles of over-reactivity and laxness, which were specific foci of the individual web-based training content. The null findings could be attributable to a type II error. The small sample size and lack of statistical power were definite limitations that can contribute to type II error. Based on our outcomes, we plan to use an adequately powered, randomized, controlled trial in future research to control threats to internal validity and detect statistically significant differences that can be achieved with this design for increasing the contribution of peer support to online

psychoeducation intervention outcomes. However, qualitative data provide other important dimensions to this discussion.

Qualitative themes and their major codes demonstrated the way participants applied parent management training principles throughout their group work discussions in each of the intervention groups. The major codes of "parenting style", "stay calm", and "compliance rate" illustrate what participants found most important in the theme of "*applies parent management training principles"*. These codes illustrate participants' struggle to overcome coercive practices like "negative reciprocity" (Forgatch & Martinez, 1999, p. 926) and "punishment traps" (Kazdin, 2005, p. 105). Coercion is reinforced when over-reactive parenting behaviors temporarily halt noncompliance, but ultimately worsen youth behavior because they fail to provide consistent reinforcement and model the use of aggression. An exemplar post from a participant in the fourth intervention group illustrated the struggle with negative reciprocity:

> *...lately, I feel that I've been leaning more towards TC* ["task-centered" indicating the presence of harsh parenting behaviors] *because of my stress load. In fact, I've found myself in a bit of a vicious cycle. The more my approach is TC-heavy, the lower the compliance rate is and the lower my compliance rate, the more likely I am to lean towards the TC approach.*

A participant in the third intervention group summarized a similar struggle with punishment traps: *"We create our own problems many times. It pays to take a step back and think before you react to a situation or we are all creating the next generation of screamers."*

Taken together, these posts emphasize participant focus on over-reactivity. This can also be observed in the major codes that emerged from the theme "*applies parent management training principles"*. In addition, there was greater web-based content on managing over-

reactivity in the training modules, and—in retrospect—this may also account for the fact that overcoming coercive parenting practices held greater focus than overcoming laxness for participants in this study. There was also a corresponding greater statistical change in over-reactivity compared to laxness.

A further dimension for this discussion is the merged quantitative and qualitative findings. A matrix compared participants at the extremes of parenting self-agency change scores to discover commonalities and differences in peer support discussions. The matrix demonstrated that participants with the greatest improvements in self-efficacy were more deeply engaged in group work discussions that were designed for problem-based learning. Their posts demonstrated each of the *"applies parent management training principles"* theme's major codes, as well as the *"mutual aid"* theme's major codes: "mutual support", "sharing data", and "all in the same boat". The *"mutual aid"* theme's codes illustrate the helping processes participants preferred for joining in discussions and that corresponded with greater parent self-efficacy changes. The upper extreme participants' discussion posts also demonstrated the combination of major codes from both themes, which suggest their deeper engagement with the intervention. In particular, the use of the major code "all in the same boat" provides evidence of the ongoing use of social comparisons by group members for the purposes of self-efficacy appraisals—of great importance for motivation and persistence in the face of stressors.

Finally, we can also interpret enhanced self-efficacy as a necessary precursor to the clinically significant reduction in youth ODD behaviors in this intervention. We would not necessarily expect statistically significant parenting style changes during the brief intervention period of six weeks, although we could expect moderate changes in self-efficacy that could contribute to the moderately large reduction in youth ODD behaviors.

Conclusions

Overall, results suggest that peer support can contribute to psychoeducational outcomes when individual and group-based activities are synchronized with a problem-based learning strategy that facilitates group work. The problem-based learning strategy provided participants with opportunities to critically think, reflect, and apply parent management training principles. Group interaction in applying training principles lead to the emergence of mutual aid helping processes.

These results can have implications for the field of child and family social work, specifically in work with child welfare parents in need of childrearing interventions. Recruitment and retention of participants for parent management training has been limited for parents of lower socioeconomic status (Buchanan, 2006, Gross, Julion, & Fogg, 2001; Peters, Calam, & Harrington, 2005), lower educational attainment (Cunningham, Bremner, & Boyle, 1995), single-parent-headed households (Katz, et al., 2001), ethnic minority parents (Martinez & Eddy, 2005), younger parents (Reyno & McGrath, 2006), socially isolated parents (McCurdy, & Daro, 2001), and parents exhibiting problems for psychopathology or substance abuse and dependence (Barkley, et al., 1999).

Aiken et al. (2018) found client, therapeutic relationship, and program barriers to be particularly problematic for engaging child welfare parents in intervention. In our study, the online intervention design had high levels of engagement. It eliminated client barriers, like stigma, by preserving anonymity in group discussions. Relationship barriers were reduced in group discussions through the noncoercive nature of the intervention's problem-based learning strategy. Programmatic barriers were eliminated with an asynchronous online platform that overcame logistical barriers. Further research using this intervention design with child welfare

parents is recommended to determine whether their engagement would also increase by leveraging technology in similar ways to overcome client, therapeutic relationship, and program barriers.

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