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Intervention Fidelity in Psychosocial Oncology

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Intervention fidelity refers to strategies that practitioners and researchers use to monitor, enhance, or evaluate the accuracy and consistency of the delivery of an intervention to ensure that it is implemented according to how it was planned. The purpose of the authors in this article was to evaluate intervention fidelity in the psychosocial oncology intervention effectiveness research. Twenty-eight studies located in a previous systematic review on psychosocial oncology intervention effectiveness comprised the sample for this research. A treatment fidelity checklist was applied to each study independently by each author (MP & PB). Percent agreement between raters ranged from 68% to 100% (M = 89%). Overall, the mean proportion of adherence was 0.57 (SD 0.12), which may be considered to be moderate fidelity. Critical examination and applicability of the checklist in examining and assessing intervention fidelity were highlighted and discussed. Overall, intervention fidelity was adequately addressed in the psychosocial oncology intervention effectiveness research, and integrity was confirmed in the majority of studies reviewed. Suggestions for future psychosocial oncology effectiveness research were made.

KEYWORDS Psychosocial oncology, intervention fidelity, supportive care, cancer

Intervention fidelity has been referred to as a set of methodological practices that are used to monitor and improve the reliability and validity of psychosocial or behavioral interventions (Bellg et al., 2004). In its earliest conceptualization, the term integrity was used to describe the extent to which the intervention was implemented as it was originally intended. The concept of intervention fidelity has since evolved. Several important elements have

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been added to the intervention fidelity repertoire as researchers acknowledge the importance of intervention fidelity in psychosocial health research. These concepts include intervention differentiation (assessing whether distinct intervention conditions may be appropriately differentiated from one another; Moncher & Prinz, 1991), intervention receipt (examining patient understanding of skills and strategies learned in intervention), and intervention enactment (patient's ability to implement learned skills outside of the actual intervention setting; Lichstein, Riedel, & Grieve, 1994). These components of intervention integrity have been highlighted by Bellg and colleagues (2004) and have been refined and further developed in a comprehensive framework for use in intervention research. This framework incorporates elements that are not only useful for assessing the intervention fidelity of completed research, but the measure also highlights practical considerations when initially designing and developing an intervention effectiveness study (Borrelli et al., 2005). According to this framework, each of the five identified components—intervention design, training of intervention providers, delivery of intervention, receipt of intervention, and enactment of intervention skills—are important in evaluating intervention fidelity.

Intervention fidelity is critical for determining the validity and reliability of results in psychosocial oncology research, and may facilitate knowledge translation. Relatively little attention has been paid to reporting intervention fidelity practices and procedures. Inadequate reporting and inattention to dissemination capabilities have recently been highlighted as two among several barriers to the uptake of evidence-based psychosocial care for cancer patients (Jacobsen, 2009). Furthermore, in an assessment of general health behavior intervention research (i.e., not specific to cancer) published in five major journals, only 15.5% of the studies were considered to have 'high intervention fidelity' according to Borrelli and colleagues criteria (2005). Improved reporting of intervention fidelity may enhance dissemination capabilities of psychosocial intervention in cancer care.

Ensuring high intervention fidelity is important not only because it enhances internal reliability by improving the replicability of the study findings but also because it strengthens external validity by improving the generalizability of the research results to applied settings (Borrelli et al., 2005). Agencies and organizations invest substantial time and resources in order to provide psychosocial intervention services to vulnerable patients. If fidelity is not adequately evaluated, there is less confidence that reported significant results of an intervention's effectiveness reflect the true merits of the intervention. An intervention study revealing positive effects on patients that has not adequately addressed intervention fidelity issues may not be as beneficial to patients as the results may suggest. Intervention fidelity is therefore an important element of intervention research because it enhances a researcher's ability to make strong conclusions about the efficacy or effectiveness of an intervention.

High intervention fidelity can improve the replicability of randomized or clinical trials (Bellg et al., 2004). When intervention fidelity is not carefully maintained and an intervention effectiveness study reveals significant results, it is not entirely clear whether the positive effects are the result of the psychosocial intervention itself or if another variable can account for the positive effects (Bellg et al., 2004). Similarly, if intervention fidelity is not maintained and an intervention effectiveness study revealed non significant results, it is unclear whether or not the intervention itself was ineffective or if the non-significant findings were a result of other factors, such as the improper delivery of the intervention (Ellis, Naar–King, Templin, Frey, & Cunningham, 2007). Although higher levels of therapist fidelity to the intervention model have been associated with positive patient improvements (Torrey et al., 2001), this association has not always been the case (Weisman et al., 2002). While there have been mixed results pertaining to the relevance and importance of intervention fidelity, Perepletchikova and Kazdin (2005) suggested that these inconsistent findings may be a result of inadequate methodological strategies used to assess intervention fidelity. Therefore interventionists, researchers, program developers and planners, and others invested in intervention work may find value in applying an adequate fidelity measure to psychosocial oncology interventions.

A variety of factors may challenge researchers' and clinicians' attempts at ensuring intervention fidelity. One way in which intervention fidelity may be improved is by examining how other factors are associated with intervention effects. Variables such as specific intervention characteristics, practitioner characteristics, and patient characteristics may be contributing substantially to an intervention effect (Perepletchikova & Kazdin, 2005). Intervention characteristics include the complexity of the intervention, the number of intervention providers, the amount of time specifically allocated to the intervention itself, the rate of change in the patient, and the extent to which the intervention deliverer and the patient accept the intervention (Perepletchikova & Kazdin, 2005). Provider characteristics include both the professional experience of the provider, the provider's motivation to work with a particular patient and other personal characteristics, such as personality. Finally, patient characteristics that may influence intervention fidelity include patients' personal characteristics, such as temperament and interactional styles, the severity and duration of the presenting problem, and presence of comorbid problems (Perepletchikova & Kazdin, 2005). In terms of patient characteristics, the presence of difficulty in the form of resistance, defensiveness, anger, and hostility can interfere with intervention effects, while other patient characteristics, such as positive thinking, may enhance intervention effects. These characteristics present some of the challenges inherent in applying the rigorous scientific standards of models of intervention fidelity that are applicable to real-world practice (Leventhal & Friedman, 2004). Careful consideration of these potential confounding

variables is important for conducting sound and convincing intervention research. Others include provider fidelity and intervention delivery.

Various methods have been used to monitor and study provider fidelity throughout the intervention literature. Methods that have been used to ensure appropriate training include videotaped or audiotaped supervision, role playing, and ongoing supervision to minimize deviation from the intervention protocol over time (Kazdin, 2003; Perepletchikova, Treat, & Kazdin, 2007). Bellg et al. (2004) listed goals to help guide and improve intervention delivery. These goals include controlling for provider differences (assessing patient perceptions of provider's warmth and credibility), diminishing differences within intervention (all patients in the same intervention condition are provided with the same intervention), ensuring adherence to the intervention protocol (providers are delivering the specified content and dose outlined in the protocol), and minimizing contamination between intervention conditions, particularly when intervention providers are the same across different conditions. Some advancements have been made in the assessment of the therapeutic alliance (e.g., Godfrey, Chalder, Ridsdale, Seed, & Ogden, 2007), specifically by measuring supportive encouragement, involvement, warmth, rapport, and empathy, among other items related to therapeutic alliance. Further attempts at ensuring fidelity have involved measures of adherence to the intervention protocol such as the development of and reliance on a standardized manual in which the intervention is thoroughly described, and detailed protocol and scripts are provided (Randall & Biggs, 2008). It has been suggested that well-developed standardized manuals are considered the gold standard of measuring intervention fidelity. Implementation of a manualized intervention, however, does not ensure that an intervention is delivered uniformly. Differential intervention effects may be a result of characteristics of the interventionists themselves and not necessarily as a result of standardizing an intervention through the use of a manual.

Another strategy has been the completion of checklists by providers to indicate that the components of the intervention were delivered. Intervention provider self-report measures have not been introduced without criticism. It has been suggested that self-reports of intervention fidelity may be subject to distortion and inaccurate perceptions of intervention delivery (Perepletchikova et al., 2007). While potential limitations of the self-report measure exist, intervention developers may gain insight into how the interventionist perceives his or her intervention-delivery skills. Furthermore, this method may benefit the interventionist by (1) increasing one's awareness of his or her intervention delivery skills as well as (2) explicitly outlining the intervention objectives.

Self-report measures may overestimate the level of intervention fidelity and therefore may be less reliable than viewing videotaped sessions (Brandt, Kirsch, Lewis, & Casey, 2004). It has been suggested that the gold standard of assessing intervention delivery is by expert evaluation and coding of intervention sessions, such as evaluating videotaped or audiotaped sessions

(Bellg et al., 2004). For example, Breitbart and colleagues (2009) conducted a randomized controlled trial of meaning-centered group psychotherapy for patients with advanced cancer in which a random sample of audiotaped sessions were rated by the investigators to assess adherence and contamination. Expert evaluation of intervention integrity does require considerable planning and resources (Brandt et al., 2004) and may be viewed as costly and laborious. This limitation may call into question the feasibility of this measure of intervention delivery when real-world issues such as budget constraints and time-intensive coding are considered.

Patient compliance involves the ability of the patient to understand and enact the intervention-related skills and strategies (Bellg et al., 2004). Understanding and enacting the strategies can be measured by administering pre- and posttest knowledge measures, setting achievement-based objectives to facilitate the evaluation of these skills, and reviewing homework assignments depending on the intervention (Bellg et al., 2004). Measures of adherence to intervention may include administering questionnaires and objective measures to test patient acquisition of intervention skills at both pre- and post- intervention to compare changes (Bellg et al., 2004; Ellis et al., 2007). Patient compliance is a component of intervention fidelity that provides researchers and practitioners with insight into the extent to which a patient clearly understands and can execute the intervention strategies. Furthermore, compliance measures provide researchers and practitioners with a means of evaluating the extent to which patients follow through with intervention requirements.

Attention to intervention fidelity in the research process can be viewed as an important process in social work research. Not only is it critical for researchers and practitioners to ensure high intervention fidelity for the purposes of having confidence in study results, but also because high fidelity can facilitate the translation of knowledge from research into practice. The purpose of the authors in the present systematic review was to examine the extent to which intervention fidelity was assessed in recent clinical trials of psychosocial oncology interventions. A recent examination of 319 abstracts from PubMed did not reveal a review of fidelity in psychosocial oncology research. The authors employed the search results (i.e., clinical trials) from a recently completed systematic review of intervention effectiveness of psychosocial oncology interventions in this review (Preyde & Synnott, in press) and the intervention fidelity assessment checklist developed by Borrelli and colleagues (2005) was applied to each clinical trial.

METHOD

In the original systematic review, 27 intervention effectiveness studies published in English from 1999 to 2007 were identified by online search of the MEDLINE, CINAHL, PsycINFO, Social Sciences Citation Index, Social Services

Abstracts, and PubMed databases. Keyword and title search terms included psychosocial, care, intervention, service, support, oncology, effectiveness (effect*) and evaluation (evaluat*). Inclusion criteria were: (a) any type of psychosocial intervention delivered during the medical treatment phase of cancer, (b) primary cancer (i.e., not recurrent) with no restriction on specific cancer characteristics (i.e., patients with cancer of any histological type), (c) randomized controlled trial or quasi-experimental trial (i.e., design included a control or comparison group) (d) adult population, (e) measured one or more intended effects of psychosocial intervention (psychological adjustment, quality of life (QOL), or patient well-being). The two authors of the original systematic review independently identified all trials, and any disagreements were settled by consensus. The search yielded 1,702 titles, of which 1,628 were excluded due to incorrect age group, not during medical treatment phase, or the intervention was not psychosocial oncology; 74 titles and abstracts were examined and 38 studies excluded due to ineligible study design, intervention, or sample; of the 36 remaining journal articles nine were excluded because they were not original studies or the intervention was not during the medical treatment phase. One additional study was located after the original search was completed, and is included in the present review.

In the current report the authors (MP and PB) independently coded each of the 28 articles according to the 25-item checklist presented in Borrelli et al. (2005) and Borrelli (B. Borrelli, personal communication, August 4, 2008) as 'present', 'absent' or 'not applicable'. Intercoder reliability was assessed and agreement between raters ranged from 68% to 100% (M = 89%). At a subsequent meeting, coders achieved consensus on all discrepant items.

RESULTS

A summary of the results of the intervention fidelity checklist appear in Table 1. For each item, percent calculations reflected the number of articles for which each item was 'present' (versus 'absent'). Studies that included items that were coded as 'not applicable' were not included in these analyses. The mean proportion of adherence strategies for each of the five intervention fidelity categories appears in Table 2. Mean proportion of adherence values were calculated according to Borrelli and colleagues' (2005) methods for each of the five intervention fidelity strategies. For each article, the total number of items coded as 'present' was divided by the number of applicable items. Across all studies, the mean proportions of adherence were as follows: 0.75 (Design), 0.56 (Enactment), 0.49 (Receipt), 0.43 (Training), and 0.39 (Delivery). None of the studies examined met or exceeded Borrelli et al.'s (2005) *high intervention fidelity* cut off value (mean proportion of adherence greater or equal to 0.80). Study characteristics and total fidelity scores appear in Table 3.

TABLE 1 Percentage of Articles that Included the Intervention Fidelity Components

Intervention fidelity components	Journals examined	
	%	*N*
Intervention Design		
Intervention Dose Information (Intervention Group)		
1. Contact session(s) length	75	21
2. Number of contacts	93	26
3. Intervention content	100	28
4. Duration of contact over time	79	22
Intervention Dose Information (Comparison/Control Group)		
5. Contact session(s) length	42	11
6. Number of contacts	59	16
7. Intervention content	78	21
8. Duration of contact over time	39	11
9. Reference to intervention provider credentials	93	26
10. Reference to theoretical model or clinical guidelines	100	28
Training Providers		
11. Details of intervention provider training	38	10
12. Standardized intervention provider training	67	18
13. Measured provider skill acquisition post-training	8	2
14. Reference to how skills were maintained over time	50	13
Delivery of Intervention		
15. Means of ensuring intervention content delivered as intended	46	13
16. Means of ensuring that intervention dose delivered as intended	33	9
17. Mechanism to assess if provider adhered to the intervention (human providers only)	52	13
18. Addressed non-specific intervention effects	8	2
19. Intervention manual	44	12
Receipt of Intervention		
20. Patient/Client comprehension assessed during intervention period	30	8
21. Strategy included to improve patient/client comprehension beyond what is already included in the intervention	61	17
22. Assessed participant's ability to perform intervention skills during intervention period	39	11
23. Strategy included to improve participant performance during intervention period	64	18
Enactment of Intervention Skills		
24. Assessed participant performance in settings in applied settings	67	18
25. Assessed strategy to improve participant performance of intervention skills in applied settings	44	12

TABLE 2 Adherence to Strategies

Strategies	Mean proportion	*SD*	*N*
Design	.75	.17	28
Training	.43	.34	27
Delivery	.39	.27	28
Receipt	.49	.25	28
Enactment	.56	.42	27
Mean Adherence	.57	.12	28

TABLE 3 Study Characteristics and Fidelity Scores

Lead author	Design	Type of cancer	Intervention	Mean proportion scores					Overall treatment fidelity score (%)[1]
				Design	Training	Delivery	Receipt	Enactment	
Allen (2002)	RCT	Breast	Six sessions over 12 month period with oncology nurse providing problem-solving skills training and informational materials	0.6	0.0	0.2	1.0	1.0	52
Andersen (2004)	RCT	Breast	Weekly sessions over 12-week period with clinical psychologist teaching strategies to reduce stress, improve mood, alter health behaviors, maintain adherence to cancer treatment	0.9	0.5	0.6	0.5	1.0	68
Arving (2007)	RCT	Breast	Individual psychosocial support (e.g., relaxation, distraction, activity scheduling, improving communication provided by trained oncology nurse or psychologist	0.6	0.8	0.0	0.8	0.5	52
Badger (2005)	Pilot RCT	Breast	Six weekly sessions with nurse counselor who provided telephone interpersonal therapy and cancer education; partners received 3 sessions in same time frame	1.0	0.8	0.6	0.5	0.0	72
Beaver (2006)	Pilot: Consecutive (non-randomized)	Breast	Nurse-led telephone intervention aimed to meet information needs of patients; provided at 2 months and 8-12 months post-diagnosis	0.7	1.0	0.6	0.3	0.0	60
Boesen (2005)	RCT	Malignant melanoma	Six weekly sessions of 2.5 hours of psychoeducation led by physicians, nurses, and a psychologist	0.6	0.3	0.2	0.3	1.0	44
Bordeleau (2003)	RCT	Breast	Weekly, 90-minute, therapist-led support group based on supportive-expressive therapy principles; women asked to attend sessions for 1 year or longer	1.0	0.8	0.4	0.3	0.0	64
Boyes (2006)	RCT	Not specified	Feedback consisting of patient psychological well-being information over course of treatment (interpretation and management proposals) provided to medical oncologists	0.8	n/a[2]	1.0	0.3	n/a[2]	63

(*continued*)

TABLE 3 (*Continued*)

Lead author	Design	Type of cancer	Intervention	Mean proportion scores					Overall treatment fidelity score (%)[1]
				Design	Training	Delivery	Receipt	Enactment	
Chan (2005)	RCT	Gynecologic	Individual psychological interventions provided by experienced clinical psychologists once every 2 weeks during active treatment, and once every 6 weeks for 18 months afterward	0.8	0.3	0.4	0.3	0.5	52
Chan (2006)	RCT	Breast	Three psychosocial intervention groups: Body-Mind-Spirit, comprising western psychotherapeutic elements and Chinese philosophical values and health practices, Supportive-Expressive, and Social Support Self-Help	1.0	0.0	0.2	0.3	0.5	50
Christman (2004)	RCT	Gynecologic, Head and Neck, Lung	Concrete objective information and relaxation instruction delivered by tape recordings during first and last week of treatment	0.5	1.0	0.7	0.8	1.0	65
Coward (2003)	Partial randomization (preference; quasi-expt)	Breast	Eight weekly, 90 minute closed support group sessions based on self-transcendence theory; led by an oncology clinical nurse specialist, a breast cancer survivor, and a psychotherapist	0.5	0.0	0.0	0.5	0.5	32
Dalton (2004)	RCT	Breast, Lung, Lymphoma, Colon, Other	Five 50 minute, nurse-led treatment sessions of either profile-tailored cognitive-behavioral therapy or standard cognitive-behavioral therapy	0.8	0.8	0.6	0.8	1.0	76
Edgar (2001)	RCT	Breast, Colon	A short-term psychoeducational coping skills training intervention (Nucare) delivered in five 90 minute sessions; Three intervention groups: Nucare on individual basis, Nucare in group format, non-directive supportive group	1.0	0.3	0.4	0.5	0.0	60
Given (2004)	RCT	Breast, Lung, Colon, Other	Ten sessions, over the course of 20 weeks, of nurse-administered cognitive-behavioral intervention focusing on symptom management	0.5	0.5	0.6	1.0	1.0	64

(*continued*)

TABLE 3 (*Continued*)

Lead author	Design	Type of cancer	Intervention	Mean proportion scores					Overall treatment fidelity score (%)[1]
				Design	Training	Delivery	Receipt	Enactment	
Hoff (2005)	RCT	Breast, Prostate, Other	Education/orientation program provided by investigator for patients and their families	0.9	0.0	0.2	0.5	1.0	56
Jacobsen (2002)	RCT	Breast, Gynecologic, Lung, Lymphoma, Colon, Prostate	Stress management training that was either professionally administered during a 60 minute session with a mental health professional, or self-administered using a package of instructional resources	0.7	0.5	0.2	0.5	1.0	56
Katz (2004)	Pilot RCT	Oral	Psychoeducational intervention involving individual 60–90 minute, pre- and post-operative, nurse-led presentations of the content of a psychoeducational booklet developed by a multi-disciplinary team	0.9	0.3	0.0	0.5	0.5	52
Kuijer (2004)	RCT	Breast, Lung, Intestinal, Brain, Hodgkin disease	Five 90 minute, biweekly sessions led by a psychologist based on equity theory Placement on a waiting-list for two months before intervention started	0.6	0.0	0.0	0.8	1.0	44
Lee (2006)	RCT	Breast, Colon	Up to four individualized sessions (of up to 120 minutes) delivered in patient's home or clinic	1.0	0.0	0.8	0.3	0.0	60
Lev (2001)	RCT	Breast	Five efficacy-enhancing counseling sessions based on Bandura's (1997) principles of therapy and led by nursing students on monthly basis; intervention also included viewing of video and receiving a booklet	0.6	0.8	0.2	0.3	0.0	44
Lev (2000)	RCT	Breast	Five efficacy-enhancing counseling sessions based on Bandura's (1997) principles of therapy and led by nursing students on monthly basis; intervention also included viewing of video and receiving a booklet	0.6	0.8	0.4	0.8	1.0	64

(*continued*)

TABLE 3 (*Continued*)

Lead author	Design	Type of cancer	Intervention	Mean proportion scores					Overall treatment fidelity score (%)[1]
				Design	Training	Delivery	Receipt	Enactment	
Nolte (2006)	RCT	Gynecologic	Videotape on makeup techniques and suggestions regarding chemotherapy-induced hair loss and the use of headpieces could be watched at home or in the clinic	0.6	0.3	0.3	0.0	0.5	39
Rawl (2002)	RCT	Breast, Lung, Colon	Nine visits (5 in-person, 4 by telephone) over 18 weeks with an oncology nurse; Computer-based intervention for patients and family caregivers, designed to focus attention on objective sequence of coping	0.8	0.8	0.6	0.5	1.0	72
Ritz (2000)	RCT	Breast	Advanced practice nurses' interventions (e.g., assessment, planning education); number of contacts based on individual need	0.6	0.0	0.2	0.5	0.5	43
Samarel (2002)	RCT	Breast	Weekly telephone social support and education (Phase I); weekly in-person social support and education (Phase II); bi-monthly and monthly telephone social support and education (Phase III)	0.1	0.5	0.8	0.8	0.5	79
Sandgren (2003)	RCT	Breast	Six individual, oncology nurse-led phone therapy sessions of 30 minutes based on either breast cancer health education or emotional expression	0.7	0.8	0.6	0.3	0.0	56
Scura (2004)	Pilot RCT	Prostate	Telephone support and education led by oncology research assistant over the course of 12 months	0.8	0.3	0.2	0.3	0.0	44

Note. [1]Number of items present divided by the number applicable items × 100.
[2]None of the items for this category were applicable for the study under consideration.
RCT = Randomized Controlled Trial.

DISCUSSION

In this sample of psychosocial oncology intervention effectiveness studies, the original authors of the clinical trials partially assessed fidelity to intervention. Investigators appear to be reporting thorough details of the experimental condition including intervention provider credentials and training. Many investigators also reported the use of appropriate strategies to improve participant comprehension and performance. Improvements could be made in the use and reporting of strategies for ensuring appropriate delivery of the intervention including content, dose, and provider adherence.

In terms of intervention design, analyses of the studies revealed that while the intervention of interest was well described, the control or comparison condition was not. Oftentimes, control or comparison groups were provided with interventions that were usually offered. Little information about the usual psychosocial oncology care was provided. In addition, it is likely that the usual care groups were quite different from one study to another. For example, the control condition in one study was the usual psychosocial care that is provided to all patients in that hospital (Jacobsen et al., 2002). This usual care involved standardized screening by an oncology social worker who then arranged for services as dictated by the patients' needs (e.g., providing information to the patient or referral to psychiatry if needed). This level of screening and addressing patients' needs did not appear to be available for any other usual care conditions across the studies analysed in this review.

Although there may be some conceptual similarities in terms of general techniques potentially included in standard care psychosocial interventions for cancer patients, it is also just as likely the case that these techniques may have different influences depending on particular characteristics of the sample under study. For instance, techniques in a usual care group that may be considered standard care for distressed female patients with breast cancer may be distinctively different from a conceptually similar usual care group for distressed male patients with colon cancer. A question, therefore, may be: what does a standard care group as a control or comparison group actually mean and what can we conclude about the effectiveness of an intervention that includes this type of group as a comparison?

Another relevant issue with respect to control or comparison groups is the implication of patients knowingly receiving intervention compared to those patients who are knowingly receiving no form of intervention to specifically alleviate their distress. Relevant threats to internal validity include diffusion of intervention effects and differential attrition across groups. Patients who are receiving psychosocial interventions may communicate with patients at the same intervention location who may have been allocated to the control or comparison group. This form of contamination may negatively influence patients in the control/comparison group. Furthermore, researcher effects

may also threaten the internal validity of the research study. It is possible that researchers who are facilitating both the intervention and control/comparison groups may be at risk of implementing intervention techniques with patients in the control condition, even if this was done unintentionally. In the intervention fidelity checklist, adherence to the delivery of intervention and assessment of receipt of intervention only applied to the experimental condition; however, adherence to the control condition should be evaluated.

In terms of training providers, the acquisition of provider skills post-training was not well-reported. Some improvement could also be made with respect to reporting how the skills were to be maintained over time. The majority of studies incorporated a standardized approach to training intervention providers; though, few reported details in most studies. Provider training is important; however, assessing the delivery of the intervention over time can also reflect the adequacy of training.

Delivery of the intervention as it was intended is an important component of intervention fidelity. Analyses revealed that the assessment and reporting of the delivery of intervention was the weakest component of fidelity in this sample of studies. While ensuring that an intervention is delivered as intended is a critical aspect of assessing the outcomes of an intervention, it is also important to acknowledge the potential difficulties for clinicians and intervention providers to allocate additional time to complete supplementary assessment measures. Although, if intervention developers are cognizant of the busy schedules of clinicians, easy and efficient means of assessing intervention delivery may be streamlined and integrated into a clinician's regular schedule.

There were few instances when non-specific intervention effects were evaluated in these psychosocial oncology studies. For example, characteristics of service providers from the perspective of the patients such as perceived warmth and credibility of the intervention providers may be particularly important to patients with cancer who may be quite distressed and feel vulnerable. A strong and positive therapeutic alliance may be critical, if not central, to the success of the intervention outcome. Therefore, in future studies inclusion of measures of non-specific intervention effects may prove useful when assessing intervention delivery.

In this sample, assessment of the Receipt and Enactment of Intervention were done moderately well. Clearly, improvements could be made in assessing participant comprehension of the intervention and performance of skills to be acquired during the intervention. Improvements could also be made in the use of assessment strategies of participant performance of skills in the settings in which they would normally be applied. While many studies did not include such an assessment, it would have been interesting to have a measure of the extent to which patients employed the strategies that were taught in the context of the hospital, clinic, or other location in which the intervention took place to other areas in the patients' lives outside

of the intervention locations. Contextualizing the current study samples and recognizing that oncology patients may be overwhelmed with day-to-day tasks, side effects, and fatigue, it may be too onerous to place further demands on these patients. Patients with cancer who are offering their time and expending energy to participate in research may find it difficult to complete the extensive battery of tests needed to ensure the long-term acquisition and actual use of skills. A request from researchers or interventionists to complete additional measures beyond those central to the intervention, such as regular self-reports of one's ability to perform the skills during the intervention period, may be too demanding. This may be seen as an unrealistic request since they may already be feeling burdened with the illness itself and fatigued by the tasks they may have to do to manage the illness. However, patients' uses of strategies outside the intervention context could be assessed with the addition of one, or at most, two items. The selection of measures, then, requires careful consideration.

Limitations

One limitation of this review was that the investigators of the primary studies may have adhered to more items on the checklist than were reported. It is possible that items coded as 'absent' were actually included in the intervention, but because it was not explicitly reported in the journal article, it may have incorrectly been coded as absent. This limitation may be related to the page constraints for journal submission. Other limitations concern the ease of use and accuracy of the checklist. A small number of the items in the Treatment Fidelity Checklist (B. Borrelli, personal communication, August 4, 2008; Borrelli et al., 2005) were ambiguous or unfounded and therefore, difficult to apply. For example, the training of intervention providers together was considered one indication of standardization of provider training; however, equal and appropriate uptake of training might be considered a better assessment of standardization.

On occasion, it was difficult to tease apart certain aspects of the questions to make a decision regarding an item's *presence* or *absence* in a particular study. For example, the item referring to the inclusion of a strategy to improve participants' comprehension above and beyond what was included in the intervention was difficult to answer at times. In some of the studies, it was questionable whether or not to consider a manual provided to participants as a reference guide (i.e., a supplement to the intervention) or if the manual was to be considered a central feature of the intervention itself. Furthermore, inclusion of a strategy does not ensure that patients will *utilize* the strategy to enhance patients' commitment or participation in carrying out the intervention as anticipated by service providers.

Similarly, in many studies the details (e.g., length of contact, number of contacts, etc.) of the care as usual condition were not reported. For this

checklist, the content of the usual care need not be described as long as it is indicated that participants received usual care; however, usual care can change drastically from one hospital site to the next. Despite these limitations, the checklist permitted good comparison across studies.

In the present study the authors highlighted the extent of intervention fidelity of the sampled studies, and areas that could be improved in future intervention effectiveness studies. The results of the current study point to the usefulness of the Treatment Fidelity Checklist developed by Borrelli and colleagues (2005) in psychosocial oncology research. Not only does this checklist appear to have potential benefits for researchers assessing intervention fidelity, but it also appears to be a promising tool for the development and implementation of psychosocial oncology interventions. Even if items may not be included for particular reasons related to the associated feasibility, applicability, or logistics of adhering to certain items, the checklist may still allow intervention developers to *consider* the items when designing an intervention.

Overall, intervention fidelity was adequately assessed in the psychosocial oncology intervention effectiveness research, and integrity was confirmed in the majority of studies. In future research, improvements could be made in assessing and substantiating the delivery of the intervention and control conditions, particularly that the content and dose were delivered as intended. Similarly, improvements could be in evaluating non-specific intervention effects. Attention to intervention fidelity may ultimately lead to improved psychosocial outcomes for patients with cancer. The transfer of knowledge from high quality clinical trials with high intervention fidelity can enhance evidence-based practice.

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