



Warm Handoffs for Improving Client Receipt of Services: A Systematic Review

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Abstract

Introduction Warm handoffs intend to improve receipt of services by clients who receive referrals to services that are stigmatized or not easily accessible. Such strategies are characterized as the handoff or transfer of an individual between two service providers through a face-to-face, phone, or technology-assisted interaction. This approach may be useful for maternal and child health home visitors who provide direct services and facilitate connections to community resources for client families. However, little is known about the effectiveness of warm handoffs.

Methods A systematic review of the literature on warm handoffs was conducted with studies identified in four databases. Full text was reviewed for studies for which abstracts met inclusion criteria or for which abstracts were not available. Evidence tables summarizing study characteristics, outcome measures and data sources, intervention descriptions, intervention components, and study results were constructed.

Results Of the 42,816 unique articles identified, 32,163 titles/abstracts were screened, 227 qualified for full text review, and five comprised the study sample. Three studies examined referrals from substance use treatment centers to self-help groups, one from federally qualified health centers to community mental health clinics, and one from a mobile needle exchange program to substance use treatment/intake. Three studies showed increases in receipt of services by clients following referral between the warm handoff intervention and control group.

Discussion Current evidence regarding the effectiveness of warm handoffs is limited. An examination of the effectiveness of warm handoffs in the context of home visits is needed to assess whether they facilitate client referrals.

Keywords Referral and consultation · Systematic review

Significance

What is already known on this subject? Warm handoffs are an effective tool for reducing medical errors and increasing patient engagement in hospital settings. Although warm handoffs were designed to enhance patient safety, they are used more broadly in outpatient care settings to improve provider communication and patient engagement during referrals.

What this study adds? While service providers advocate for warm handoffs in a variety of practice settings, there has been no synthesis of evidence of their effectiveness. Our

findings suggest that while warm handoffs may be effective in some settings, further examination is necessary to recommend their use.

Introduction

A warm handoff is an approach to improve linkages between clients and service providers, especially when services are stigmatized or are not easily accessible (Manoleas 2008; Pace et al. 2018). Hospitals popularized warm handoffs as an intervention to improve patient safety and streamline communication during shift changes. Warm handoffs recently have been evaluated as a quality improvement tool for physician-to-physician end-of-rotation handovers, and shown to be a safer means of transitioning care (Saag et al. 2017). Although designed to enhance patient safety, warm handoffs now are being used to support transitions

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between hospital-based clinicians and outpatient providers, and between providers in outpatient integrated care settings (Campbell Britton et al. 2019; Davis et al. 2015). Warm handoffs are hypothesized to improve client receipt of services by familiarizing clients with new providers or services that may be stigmatized or difficult to access due to competing priorities of clients and service providers and other barriers.

Many families served by maternal and child health home visiting programs have complex social, economic, and health needs. Seventy percent of families served by the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program in 2019 had household incomes at or below 100% of the federal poverty line (MCHB 2020). As reported in the Mother and Infant Home Visiting Program Evaluation (MIHOPE), 20% moved more than once in the previous year, and 38% screened positive for maternal depression (Duggan et al. 2018). Families with a history of household substance use are considered a priority group for MIECHV; in MIHOPE, 31% of women reported binge drinking or use of illegal drugs in the month prior to pregnancy (Duggan et al. 2018). More than one fourth (26%) of women reported that they experienced or perpetrated intimate partner violence in the past year, and 21% reported moderate or severe anxiety symptoms (Duggan et al. 2018). To address these varied needs, home visitors are expected not only to provide direct services, but also to link families with needed services in community settings outside of home visiting (Michalopoulos et al. 2019).

Home visiting clients frequently do not complete service appointments following linkages made by home visitors despite continued need for those services. For example, a recent study found that only 21% of referrals made for 65 clients from five home visiting program sites resulted in connections to services (Goldberg et al. 2018). While most communities have resources in place for clients, they may be difficult to access or ineffective. MIHOPE found that more than 80% of home visiting programs reported available service providers across nine relevant service sectors; however, less than two thirds of local programs reported that these services were accessible and effective for their client families (Duggan et al. 2018). While failed service connections are not inherently fruitless, as client families may become further educated about available services, these families may never receive services from which they could benefit (Goldberg et al. 2018).

Enhancing the handoff between home visitor and service provider may increase the likelihood that families receive the services they need. If warm handoffs result in more efficient and frequent connections to services provided outside of home visiting programs, home visitors may be able to spend more time implementing their program model and achieving other model goals. Additionally, families may be better

situated to benefit from home visiting direct services, such as services to promote positive parent–child interaction, when needs beyond the scope of home visiting programs are met through other community resources.

Objective

The purpose of this review was to assess the evidence on the effectiveness of warm handoffs. Given lack of literature specific to use of warm handoffs by home visiting staff, this review analyzes literature from diverse health care settings.

Methods

Information Sources and Search Strategy

This review adhered to the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines (Moher et al. 2009). Studies were identified for review by searching PubMed, CINAHL Plus, Cochrane Library, and PsycINFO databases in October 2018. Table 1 provides the detailed search strategies used for each database. Search terms comprised: patient or client handoff; referral and consultation; relevant fields and providers; and program evaluation. Patient handoff terminology included words that could be used to describe warm handoffs such as “intensive referral” or “facilitated referral.” Relevant fields and providers terminology included relevant fields of literature such as “mental health,” “substance-related disorders,” “smoking cessation,” and “home visit.” Program evaluation terminology included study designs and methods used for empirical research such as “randomized.” The search logic was as follows:

1. Patient or client handoff concept.
2. Referral and consultation concept AND relevant fields and providers concept AND program evaluation concept.
3. #1 OR #2

A library specialist at Welch Medical Library informed database and terminology selection, and ensured adequacy of the search strategy. Duplicate articles were removed prior to title and abstract screening using Endnote X9™. Titles were reviewed in Covidence™, and the associated abstracts were screened if the title appeared relevant to warm handoffs.

Review of references from relevant articles did not yield additional records. Additionally, outreach to thought leaders on the Home Visiting Applied Research Collaborative’s (HARC) National Advisory Council (NAC) and to members of the HARC network through the quarterly newsletter did

Table 1 Detailed search strategies (peer reviewed literature)

Database	Search strategies
PubMed	#1 "Patient Handoff"[Mesh] OR patient handoff*[tw] OR patient hand off*[tw] OR warm handoff*[tw] OR warm hand off*[tw] OR patient handover*[tw] OR patient hand over*[tw] OR warm handover*[tw] OR warm hand over*[tw] OR intensive referral*[tw] OR multidisciplinary handover*[tw] OR "facilitated referral" [tw]
	#2 "referral and consultation"[Mesh] OR referral*[tw] OR consultation*[tw] OR consult [tw] OR consults [tw]
	#3 "tobacco use cessation"[Mesh] OR "smoking cessation"[Mesh] OR "substance-related disorders"[Mesh] OR "substance abuse treatment centers"[Mesh] OR "mental health"[Mesh] OR "opioid related disorders"[Mesh] OR "child welfare"[Mesh] OR "mental health"[Mesh] OR "child behavior disorders"[Mesh] OR "behavioral medicine"[Mesh] OR "Physicians, Primary Care"[Mesh] OR "Primary Health Care"[Mesh] OR "Physicians, Family"[Mesh] OR case manager*[tw] OR case worker*[tw] OR "collaborative care"[tw] OR "integrated behavioral health" [tw] OR "integrated health" [tw] OR quitline*[tw] OR quit line*[tw] OR collocat*[tw] OR colocat*[tw] OR "co-location" [tw] OR primary care physician*[tw] OR primary care doctor*[tw] OR "primary health care" [tw] OR family physician*[tw] OR "mental health" [tw] OR home visit * [tw] OR homevisit*[tw] OR "SBIRT" [tw] OR "screening brief intervention and referral to treatment" [tw]
	#4 "Program Evaluation"[Mesh] OR "Quality of Health Care"[Mesh:NoExp] OR "Quality Improvement"[Mesh] OR "Quality Assurance, Health Care"[Mesh:NoExp] OR "Utilization Review"[Mesh] OR "Evaluation Studies as Topic"[Mesh] OR "Evaluation Studies" [Publication Type] OR "Evidence-Based Medicine"[Mesh] OR "Guideline Adherence"[Mesh] OR "Guidelines as Topic"[Mesh] OR "Surveys and Questionnaires"[Mesh:NoExp] OR evaluat*[tw] OR "evidence based"[tw] OR assessment*[tw] OR effectiveness[tw] OR campaign*[tw] OR strateg*[tw] OR "outcome assessment" [tw]
	#5 #2 AND #3 AND #4
	#6 #1 OR #5
CINAHL Plus	S1 (MH "Hand Off (Patient Safety) + ") OR TI (((patient* OR warm OR multidisciplinary) N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*)) OR AB (((patient* OR warm OR multidisciplinary) N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*)) OR SU (((patient* OR warm OR multidisciplinary)N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*))
	S2 (MH "Referral and Consultation + ") OR TI (referral* OR consultation* OR consult OR consults) OR AB (referral* OR consultation* OR consult OR consults) OR SU (referral* OR consultation* OR consult OR consults)
	S3 (MH "Smoking Cessation") OR (MH "Smoking Cessation Programs") OR (MH "Substance Use Disorders + ") OR (MH "Substance Use Rehabilitation Programs + ") OR (MH "Mental Health") OR (MH "Mental Health Services + ") OR (MH "Child Welfare + ") OR (MH "Maternal-Child Welfare") OR (MH "Primary Health Care") OR (MH "Physicians, Family") OR (MH "Child Behavior Disorders + ") OR (MH "Behavioral Sciences + ") OR TI ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*) OR AB ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*) OR SU ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*)
	S4 (MH "Program Evaluation") OR (MH "Quality of Health Care") OR (MH "Quality Improvement") OR (MH "Quality Assurance") OR (MH "Evaluation Research") OR (MH "Utilization Review") OR (MH "Medical Practice, Evidence-Based") OR (MH "Guideline Adherence") OR strateg* OR campaign* OR (MH "Surveys") OR (MH "Questionnaires") OR TI (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment") OR AB (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment") OR SU (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment")
	S5 S2 AND S3 AND S4
	S6 S1 OR S5

Table 1 (continued)

Database	Search strategies
Cochrane Library	#1 MeSH descriptor: [Referral and Consultation] explode all trees
	#2 referral* OR consultation* OR consult OR consults
	#3 #1 OR #2
	#4 MeSH descriptor: [Patient Handoff] explode all trees
	#5 ((patient* OR warm OR multidisciplinary) NEAR/2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((Intensive OR facilitated) NEAR/2 referral*)
	#6 #4 OR #5
	#7 MeSH descriptor: [Tobacco Use Cessation] explode all trees
	#8 MeSH descriptor: [Smoking Cessation] explode all trees
	#9 MeSH descriptor: [Substance-Related Disorders] explode all trees
	#10 MeSH descriptor: [Opioid-Related Disorders] explode all trees
	#11 MeSH descriptor: [Child Welfare] explode all trees
	#12 MeSH descriptor: [Behavioral Medicine] explode all trees
	#13 MeSH descriptor: [Physicians, Primary Care] explode all trees
	#14 MeSH descriptor: [Primary Health Care] explode all trees
	#15 MeSH descriptor: [Child Behavior Disorders] explode all trees
	#16 MeSH descriptor: [Physicians, Family] explode all trees
	#17 "SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager" OR "case managers" OR "case worker" OR "case workers" OR "collaborative care" OR "quitline" OR "quitlines" OR "quit line" OR "quit lines" OR collocat* OR colocat* OR "co-location" OR ("primary care" NEAR/2 (physician* OR doctor*)) OR (integrated NEAR/2 health) OR "primary health care" OR family physician* OR "mental health" OR (home NEAR/1 visit*)
	#18 #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17
	#19 MeSH descriptor: [Program Evaluation] explode all trees
	#20 MeSH descriptor: [Quality of Health Care] this term only
	#21 MeSH descriptor: [Quality Improvement] explode all trees
	#22 MeSH descriptor: [Quality Assurance, Health Care] this term only
	#23 MeSH descriptor: [Utilization Review] explode all trees
	#24 MeSH descriptor: [Evaluation Studies as Topic] explode all trees
	#25 MeSH descriptor: [Evaluation Studies] explode all trees
	#26 MeSH descriptor: [Evidence-Based Medicine] explode all trees
	#27 MeSH descriptor: [Guideline Adherence] explode all trees
	#28 MeSH descriptor: [Guidelines as Topic] explode all trees
	#29 MeSH descriptor: [Surveys and Questionnaires] this term only
	#30 Evaluat* OR "evidence based" OR assessment* OR effectiveness OR campaign* OR strateg* OR "outcome assessment"
	#31 #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30
	#32 #3 AND #18 AND #31
	#33 #6 OR #32

Table 1 (continued)

Database	Search strategies
PsycINFO	<p>S1 DE "Client Transfer" OR TI (((patient* OR warm OR multidisciplinary) N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*)) OR AB (((patient* OR warm OR multidisciplinary) N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*)) OR SU (((patient* OR warm OR multidisciplinary) N2 (handoff* OR "hand off" OR "hand offs" OR handover* OR "hand over" OR "handovers")) OR ((intensive OR facilitated) N2 referral*))</p> <p>S2 DE "Professional Referral" OR DE "Professional Consultation" OR TI (referral* OR consultation* OR consult OR consults) OR AB (referral* OR consultation* OR consult OR consults) OR SU (referral* OR consultation* OR consult OR consults)</p> <p>S3 DE "Smoking Cessation" OR DE "Substance Use Disorder" OR DE "Support Groups" OR DE "Drug Rehabilitation" OR DE "Mental Health" OR DE "Child Welfare" OR DE "Social Services" OR DE "Behavior Disorders" OR DE "Drug Abuse" OR DE "Behavioral Sciences" OR DE "Behavioral Medicine" OR DE "Primary Health Care" OR DE "Family Physicians" OR DE "Home Visiting Programs" OR TI ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*) OR AB ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*) OR SU ("SBIRT" OR "screening brief intervention and referral to treatment" OR "case manager*" OR "case worker*" OR "collaborative care" OR (integrated N2 health) OR quitline* or "quit line*" OR collocat* OR colocat* OR "co-location" OR ("primary care" N2 (physician* OR doctor*)) OR "primary health care" OR "family physician*" OR "mental health" OR "home N1 visit*" OR homevisit*)</p> <p>S4 DE "Program Evaluation" OR DE "Quality of Care" OR DE "Quality Control" OR DE "Utilization Reviews" OR DE "Evidence Based Practice" OR DE "Surveys" OR DE "Questionnaires" OR TI (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment") OR AB (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment") OR SU (evaluat* OR "evidence based" OR assessment* OR effectiveness OR "outcome assessment")</p> <p>S5 S2 AND S3 AND S4</p> <p>S6 S1 OR S5</p>

not yield additional records. One additional reference published in March 2019 was identified by the study team and added given relevance to the review objective. This review is not based upon clinical study or patient data.

Eligibility Criteria and Study Selection

The following inclusion criteria for peer-reviewed literature were used:

1. The study was empirical and assessed interventions aimed at increasing receipt of services following a referral.
2. The intervention's components and study results were clearly described.
3. The study included:
 - a. A control and intervention group design, a pretest-posttest design, or a quality improvement design to examine effectiveness of the intervention. Only control groups featuring referrals between providers located in separate settings (not co-located) were included.
 - b. A warm handoff defined as two service providers (not necessarily medical providers) interfacing with a client in real time through a face-to-face interaction, phone conversation, or video-assisted interaction. Warm handoffs in settings where the client or patient would be considered a captive audience, such as incarcerated populations were excluded.
4. The study was conducted in the United States or another high-resource country.
5. The study was published in English.
6. The study was published in a peer-reviewed journal.

Two independent reviewers screened titles and abstracts for relevancy. Two percent of titles and abstracts were screened by both reviewers to achieve consensus on inclusion criteria (n = 683). The full text was reviewed for references for which both the title and abstract appeared to meet all inclusion criteria or in instances where the abstract was

not available. Titles and abstracts were screened simultaneously. Full text copies of the articles remaining following title and abstract screening were retrieved and imported into Covidence™ where they were assessed based on the inclusion criteria. Two independent reviewers screened a random sample of 40 full text articles with 90% inter-rater reliability. Reviewers discussed differences and reached agreement by reapplying the inclusion criteria.

Quality Assessment

The Effective Public Health Practice Project's quality assessment tool for quantitative studies was used to categorize risk of bias for individual studies in six domains: (1) selection bias; (2) study design; (3) confounders; (4) blinding of participants and outcome assessors; (5) data collection methods; and (6) withdrawals and drop-outs (Armijo-Olivo et al. 2012). Two independent reviewers (RT, CM) assigned categorical ratings of strong, moderate, or weak within each domain for the five studies. The reviewers also assigned studies a global rating based on the number of weak ratings received across the six domains. Studies were rated strong if they received no weak ratings, moderate if they received one weak rating, or weak if they received more than one weak rating. Reviewers discussed differences in ratings and reached agreement by reapplying the criteria for those domains.

Data Synthesis

One reviewer (RT) abstracted data from five selected studies using predefined tables (Garcia et al. 2018). The study team met regularly to discuss and resolve concerns.

Results

Study Selection

The study team identified 42,816 articles. The searches yielded 21,511 articles in PubMed, 1932 in Cochrane Library, 12,156 in CINAHL Plus, and 7216 in PsycINFO. Title and abstract screening were performed for 32,163 records following removal of 10,653 duplicates from the total 42,816 records. Title and abstract screening eliminated 31,936 records. Full text review of 227 articles led to the exclusion of 221 articles which did not meet all inclusion criteria. Two articles reported outcomes from the same study and were collapsed into one record. Thus, the review focused on five studies of warm handoff interventions. The review process is detailed in Fig. 1.

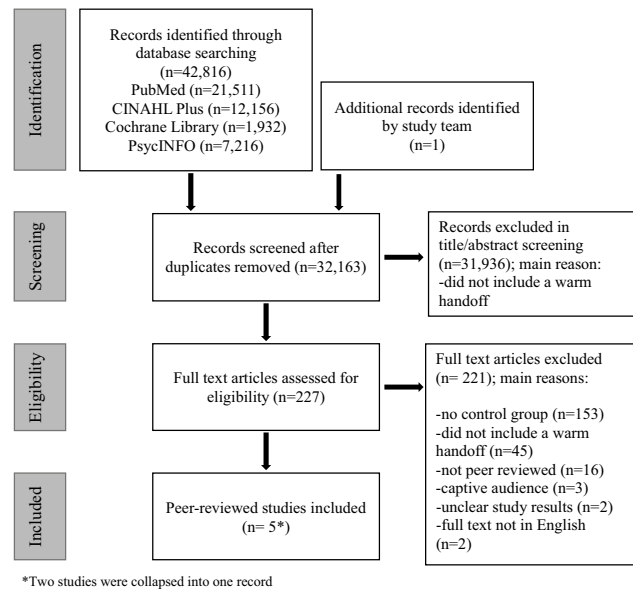


Fig. 1 Flow of Review Process

Study Quality

Table 2 provides results from the quality assessment of individual studies. Of the five included studies, one was assigned a strong global rating (Timko et al. 2006, 2007), three were assigned a moderate global rating (Coker et al. 2019; Strathdee et al. 2006; Timko et al. 2011), and one was assigned a weak global rating (Grant et al. 2018). Blinding of participants and outcome assessors proved challenging in all five studies, with three weak ratings (Coker et al. 2019; Grant et al. 2018; Strathdee et al. 2006) and two moderate ratings (Timko et al. 2006, 2007; Timko et al. 2011).

Study Characteristics

Table 3 includes main characteristics of the five studies. Three were randomized control trials, one used a pre-test–posttest quasi-experimental design, and one used a cohort cyclical turnover design. All five studies were conducted in the United States. Three studies examined referrals from substance use treatment centers to self- and mutual-help groups (Grant et al. 2018; Timko et al. 2006, 2007; Timko et al. 2011), one from federally qualified health centers (FQHC) to community mental health centers (Coker et al. 2019), and one from a mobile needle exchange program to substance use treatment/intake (Strathdee et al. 2006). One study involved referrals for pediatric patients (Coker et al. 2019).

Table 4 details data sources and outcome measures for each study. Data sources included client interviews in three studies (Grant et al. 2018; Timko et al. 2006, 2007;

Table 2 Quality assessment of individual studies (N = 5)

Source	Selection bias	Study design	Confounders	Blinding	Data collection	Withdrawals and drop outs	Global rating
Coker et al. 2019	Strong	Strong	Strong	Weak	Strong	Moderate	Moderate
Grant et al. 2018	Weak	Moderate	Weak	Weak	Strong	Moderate	Weak
Strathdee et al. 2006	Strong	Strong	Strong	Weak	Strong	Strong	Moderate
Timko et al. 2006/2007	Strong	Strong	Strong	Moderate	Strong	Strong	Strong
Timko et al. 2011	Strong	Weak	Strong	Moderate	Strong	Moderate	Moderate

Table 3 Main characteristics of included studies (N = 5)

Study	Country	Setting	Study sample		Study design
			Target sample	Sample size	
Coker et al. 2019	US	6 Federally qualified health clinics and 2 community mental health clinics	Parents of children ages 5–12 years who are publicly insured	n = 342 Intervention: (n = 164) Control: (n = 178)	RCT
Grant et al. 2018	US	3 Veterans Affairs intensive SUD ^a treatment sites in rural and urban Nebraska	Veterans 19 years and older	n = 140 Intervention: (n = 77) Control: (n = 63)	QE: pretest–posttest
Strathdee et al. 2006	US	Mobile needle exchange program in Baltimore, Maryland	Clients who sought drug use treatment	n = 245 Intervention: (n = 128) Control: (n = 117)	RCT
Timko et al. 2006/2007	US	Department of Veterans Affairs programs in California	Patients entering outpatient SUD treatment at a Department of Veterans Affairs Program	2006 n = 281 Intervention: (n = 126) Control: (n = 155) 2007 n = 307 Intervention: (n = 161) Control: (n = 146)	RCT
Timko et al. 2011	US	Department of Veterans Affairs programs in Northern California	Patients entering outpatient treatment who were identified as having dual substance use and psychiatric disorders	n = 287 Intervention: (n = 142) Control: (n = 145)	Cohort Cyclical turnover design

^a = Substance Use Disorder

Table 4 Study data sources and outcome measures

Study	Data source	Outcome measure
Coker et al. 2019	CMHC visit logs	Percentage of clients who completed the intake meeting
Grant et al. 2018	Patient interview	Mean number of mutual-help group meetings attended in 6 months
Strathdee et al. 2006	Baltimore Substance Abuse Systems Inc	Percentage of clients entering treatment by seven days post baseline
Timko et al. 2006/2007	Patient interview	Percentage of clients attending at least one 12-step group meeting at six-months post baseline Percentage of patients attending at least one 12-step group meeting at one-year post baseline
Timko et al. 2011	Patient interview	Percentage of patients who attended a dual-focused group meeting by six-month follow-up Percentage of patients who attended a substance-focused group meeting by six-months follow-up

Timko et al. 2011) and admissions and discharge data or visit logs in two studies (Coker et al. 2019; Strathdee et al. 2006).

Table 5 describes the study interventions and control groups. All studies included a standard referral to services as the comparison group. A standard referral to services could include fax referrals, appointment scheduling, or informational handouts. Table 6 identifies the intervention components for each study. Intervention components were categorized as “referring staff activities” or “volunteer/case manager activities.” Providers who initiated the referral process performed referring staff activities while providers who mediated the warm handoff performed volunteer/case manager activities.

Three studies implemented a warm handoff using an intensive referral to self- and mutual-help groups (Grant et al. 2018; Timko et al. 2006, 2007; Timko et al. 2011). Timko et al. 2006/2007 implemented an intensive referral to self-help groups for veterans in outpatient treatment centers. The intensive referral included the following: counseling sessions with treatment center staff; a real-time connection with a self-help group volunteer; and scheduling meetings for the client to attend with the self-help group volunteer. Timko et al. 2011 enhanced the intensive referral from Timko et al. 2006/2007 to include referrals to dual-focused groups for persons with both substance use disorders and mental health diagnoses. The study team also implemented mock dual-focused groups prior to referral. Grant et al. adapted the intensive referral from Timko et al. 2006/2007 for rural veterans. Adaptions included connecting clients to “buddies” from mutual-help groups local to the substance use treatment center and facilitating additional buddy contacts upon completion of treatment for rural veterans who lived far from their original mutual-help group.

Strathdee et al. provided strengths-based case management services for clients who received a referral to a drug treatment center from staff at a mobile needle exchange program. The case managers were expected to complete the referral with the client by attending their intake appointment at the drug treatment center.

Coker et al. implemented an enhanced telehealth referral from a multisite FQHC to community mental health centers (CMHCs) using a live videoconference call. A case manager at the CMHC facilitated the videoconference call with the parents and a FQHC telehealth coordinator, and then scheduled eligible families for an intake appointment with a CMHC therapist.

Synthesis of Results

Table 7 summarizes study results. Significant favorable findings for warm handoffs were demonstrated in three of the

five studies with regard to client receipt of services following a referral.

Three studies used intensive referrals to treatment with mixed results. The intensive referral adapted for rural veterans by Grant et al. did not appear effective in significantly increasing the percentage of patients who attended mutual-help group meetings at six-months following treatment. The intensive referral appeared to be effective in two other studies. In Timko et al. 2006/2007, intensive referrals significantly increased the percentage of clients attending meetings at one-year follow up, but not at 6 months follow-up. In Timko et al. 2011, intensive referrals significantly increased the percentage of clients attending both dual-focused groups and substance-focused groups at 6 months follow-up.

In Strathdee et al. case management appeared to be effective in increasing the percentage of clients who attended their intake appointment following referral from the needle exchange program.

In Coker et al., significantly more clients who received the telehealth-enhanced referral process completed an initial CMHC screening visit, but the difference by intervention group assignment in receipt of scheduled intake appointments following the screening visit was not significant.

Discussion

The purpose of this review was to identify empirical studies that evaluated the effectiveness of warm handoffs aimed at improving client receipt of services. Three studies had significant favorable differences in client receipt of services between the warm handoff and standard referral group. Our review intended to assess the effectiveness of warm handoffs for a wide array of services and found empirical literature related to mental health and substance use. Warm handoffs for other services may not be commonly used. Providers may believe such services are easier to access and may expect families to take responsibility to follow through for receiving other resources.

Although no studies examined warm handoffs in a home visiting setting, all five examined stigmatized services similar to services in high demand for home visiting client families. Despite local availability, services for substance use and mental health treatment are often inaccessible; only 47% of home visitors rate substance use and mental health services available to clients as accessible and effective (Duggan et al. 2018). Similarly, in a survey of 105 home visiting programs belonging to the practice-based research network of the HARC, more than half of the respondents noted that community services were often or sometimes difficult to access for ten out of twelve services (Correll et al. 2018). Shared elements of the services included in this review with services

Table 5 Description of the study interventions

Study	Comparison group	Description of intervention	Intervention implementation	Data collection
Coker et al. 2019	Usual care referral process. This includes a faxed referral for mental health care from the FQHC ^a and a case manager screening and scheduling an intake appointment	<p>Videokonference referral to CMHC^b</p> <p>Parents receive a referral to a CMHC from their FQHC provider and watch a 5-min introduction video.</p> <p>Parents return to the FQHC for telehealth eligibility screening facilitated by the FQHC care coordinator.</p> <p>The FQHC care coordinator connects the parents with a CMHC case manager via videokonference for eligibility screening.</p> <p>CMHC determines eligibility and schedules the family for an intake visit if indicated.</p>	April 2015–December 2016	6 months following baseline
Grant et al. 2018	Standard referral process. This includes recommendation to find and attend a mutual-help group meeting after completing treatment. The standard referral does not include sessions with the treatment center staff	<p>Rural-adapted intensive referral to mutual-help groups</p> <p>Three sessions with treatment center staff.</p> <p>Face-to-face session explaining importance of meeting attendance, schedule a meeting, phone call between staff, client, and buddy to arrange for client to meet with a mutual-help group buddy, counselor asks permission to contact family to send them an informational handout about mutual-help groups.</p> <p>Subsequent sessions follow-up on mutual-help group attendance, buddy contacts. Review expectations for mutual-help group expectations, troubleshoot participation barriers, connection with additional buddy in home community if needed.</p>	March 2013–December 2014	Baseline: Before entering treatment Follow-up: 6 months following baseline
Strathdee et al. 2006	Passive referral to drug treatment programs based on standard procedures at Baltimore Needle Exchange Programs. This includes receipt of a voucher detailing date and time of drug treatment intake appointment	<p>Free Case Management</p> <p>Initial meetings to develop collaborative partnership between client and case manager.</p> <p>Case manager instructed to accompany clients to intake visit for treatment programs and assist with immediate access barriers such as transportation and child care.</p> <p>Strengths assessment.</p> <p>Personal case planning and linkage to resources and community partners</p>	January 2002–January 2004	7 days following referral from Needle Partner Exchange

Table 5 (continued)

Study	Comparison group	Description of intervention	Intervention implementation	Data collection
Timko et al. 2006/2007	Veteran’s Affairs SUD ^c outpatient clinic standard referral procedures. Counselors gave patients a list of local AA ^d or NA ^e meetings and encouraged them to attend a 12-step self-help group. Additionally, counselors reviewed relapse prevention	Intensive referral to 12-step self-help groups 3 outpatient counseling sessions. Session 1: Patient and counselor review hand-out on 12-step self-help groups. Counselor and patient call a self-help group volunteer during counseling session for initial handoff, arrange meeting prior to attending a self-help group, and plan meetings to attend Session 2: Repeat session 1 protocol if a self-help group was not attended. Address patient concerns and doubts Session 3: Repeat session 1 protocol if a self-help group was not attended	January 2003–January 2004	Timko 2006 6 months following enrollment Timko 2007 1 year following enrollment
Timko et al. 2011	Standard referral to dual-focused group. Counselors gave patients a list of local 12-step dual-focused group meetings and encouraged attendance	Intensive referral to 12-step dual-focused help groups Attendance at four outpatient group sessions Session 1: Review pros and cons of dual-focused group meetings and provide local meetings schedule Session 2: Orient to 12-step dual-focused group meeting; discuss group meeting etiquette; address questions and concerns; simulate dual-focused group meeting Session 3: Counselor arranges for dual-focused group volunteer to attend counseling session for face-to-face interaction. Volunteer introduces him/herself to patients and arranges to attend a meeting together	N/A	Six-month follow-up

^aFederally Qualified Health Centers

^bCommunity Mental Health Center

^cSubstance Use Disorder

^dAlcoholics Anonymous

^eNarcotics Anonymous

Table 6 Intervention components of the included studies (N = 5)

Study	Referring staff activities							Volunteer or case manager activities				
	Service education prior to referral	Information about local services and schedules of meetings	Appointment/scheduling for client	Outreach by staff following referral	Mock service meeting with clients	Counseling sessions	Real-time connection with client through phone call or technology-assisted interaction	Real-time connection with client through face-to-face interaction prior to service appointment	Attendance at client meeting/appointment	Resource linkage	Case management	Strengths assessment
Coker et al. 2019	X		X				X		X		X	
Grant et al. 2018	X	X	X	X		X	X		X			
Strathdee et al. 2006			X					X		X		X
Timko et al. 2006/2007	X	X	X			X		X				
Timko et al. 2011	X	X	X	X	X	X		X				

Table 7 Study Results

Study	Results
Coker et al. 2019	Significant difference in percentage of patients who completed the initial access (80.49% vs. 64.4% control, $p < 0.001$) No significant difference in percentage of patients who completed an intake appointment (80.17% intervention vs. 83.51% control, $p = 0.53$)
Grant et al. 2018	No significant difference in the mean number of meetings attended in six months (72.1 intervention vs 65.2 control group, $p = 0.78$)
Strathdee et al. 2006	Significant difference in percentage of clients who entered drug treatment within seven days of referral date (40.0% intervention vs 26.0% control, $p = 0.03$)
Timko et al. 2006/2007	No significant difference in percentage of clients who attended at least one meeting at six-months follow-up between the intervention and control group (87.2% vs. 85.3%). Significant difference in the percentage of clients who attended at least one meeting at one-year follow up (77.8% intervention vs 69.1% control, $p = 0.048$)
Timko et al. 2011	Significant difference in the percentage of clients who attended at least one dual-focused group meeting at six-months (23.1% intervention vs. 13.5% control, $p < 0.05$) Significant difference in the percentage of clients attending at least one substance-focused meeting at six-months (84.5% intervention vs 69.9% control, $p < 0.01$)

needed by home visiting clients warrant further examination of warm handoffs as a tool for increasing receipt of services. Warm handoffs should be evaluated as a strategy to improve client receipt of services both broadly and in the home visiting setting before definitive recommendations can be made regarding their use in any single setting.

While all three studies with significant favorable findings for warm handoffs enrolled clients who used substances, the types of substances used and the types of services to which clients were referred varied. Specifically, Strathdee et al. referred clients who used injection drugs to intake appointments at health centers while Timko et al. 2006/2007 referred clients who used alcohol or drugs to self-help groups. Timko et al. 2011 referred clients with substance use disorder and concurrent mental health diagnoses to dual-focused groups. Variation in overall client receipt of services between and within studies suggests that warm handoffs may be more effective for certain populations in specific settings. Further research should be conducted examining specific components of warm handoffs to differentiate which aspects are effective, for whom, in what contexts to achieve specific outcomes.

Grant et al. and Coker et al. did not find significant differences in client receipt of services following the warm handoff, although the enhanced referral process in Coker et al. did increase client access to the CMHC eligibility screening visit. Attendance at initial intake visits by eligible families in Coker et al. in both the intervention and control group were high (80.2% intervention vs 83.5% control), suggesting that eligible families were motivated to complete services regardless of the referral process. However, significantly more families in the warm handoff group made initial contact with the CMHC, a prerequisite for receiving mental health services. These findings have important implications for use of warm handoffs to facilitate initial linkages with

service providers, despite a non-significant difference in client receipt of services.

Grant et al. examined warm handoffs between providers over the phone and did not include a face-to-face interaction between the client and the mutual-help group volunteer prior to the appointment. While the intervention in Coker et al. included a face-to-face warm handoff from a telehealth coordinator at the FQHC to the case manager from the CMHC, the case manager who mediated the warm handoff was not present for the two-hour intake visit for which eligible families were scheduled. Additionally, the family and the CMHC therapist who provided mental health services were not connected prior to the appointment. In the three studies with significant findings, the warm handoff included a face-to-face interaction with an individual who attended the initial service appointment with the client, and this connection occurred prior to the scheduled appointment. These findings suggest that face-to-face interaction with an individual who attends the initial service appointment could be a key component of successful warm handoffs.

While the enhanced referral process including a live videoconference call in Coker et al. did not significantly increase receipt of mental health services for clients, it did significantly increase initial access to the CMHC which is a requirement for eventual access of services. Live videochat may be a feasible option for home visitors who may not have time to physically attend appointments with their clients. This technology may provide face-to-face interactions in a way that is feasible for referring staff, including home visitors. If face-to-face interaction is further examined and determined to be a key component of successful warm handoffs, technology such as videochats may present an innovative means of achieving effective interactions. Such findings could have implications for home visiting programs using secure videochat to connect clients to community services

and resources. Further research is needed to assess the effectiveness of telephone and videochat warm handoffs using rigorous study designs to determine applicability for home visiting programs and similar settings.

Time constraints and caseload threaten the feasibility of implementing warm handoffs in the home visiting setting. Home visitors serve multiple families and are tasked with handling their varied needs. In the studies in this review, warm handoffs were made for one service referral, whereas home visitors may make several service connections for each of their clients. Facilitating multiple warm handoffs for each client could be time consuming and may require a change in model specifications. If warm handoffs increase connections to service providers, home visitors may spend less time discussing linkage to services and navigating complex systems, and spend more time focusing on providing direct services to achieve program goals. In addition to improving the quality of home visiting services, effective warm handoffs could increase client use of community resources.

This review incorporated evidence from a small number of studies and results should not be generalized to populations or settings that are not represented. Little evidence exists describing the effects of warm handoffs in settings where clients are not captive audiences. Four databases were searched for literature on warm handoffs, making it unlikely that articles meeting the inclusion criteria are missing from this review. Since few studies met the inclusion criteria, conclusions drawn in this review may be narrow. Four of the five included studies examined interventions to improve receipt of services for clients or patients who used substances. Additionally, most study participants were male veterans, thus limiting generalizability across diverse populations. However, the included studies were rigorously designed and identified based on strict inclusion criteria. Additionally, this review is the first to our knowledge to examine the effectiveness of warm handoffs in primary and behavioral health care settings to facilitate client linkages to community services.

Conclusion

This review identified empirical studies that implemented warm handoffs aimed at improving client receipt of services following a referral. The results suggest that warm handoffs may be an effective means of improving client follow-up in some settings. Testing interventions including warm handoffs for their effectiveness in increasing receipt of services both broadly and in the early childhood home visiting context is important given the goal of assuring that families receive services.

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