A theory led narrative review of one-to-one health interventions

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Abstract

A theory-led narrative approach was used to unpack the complexities of the factors that enable successful client adherence following one-to-one health interventions. Understanding this could prepare the provider to anticipate different adherence behaviours by clients, allowing them to tailor their interventions to increase the likelihood of adherence. The review was done in two stages. A theoretical formulation was proposed to explore factors which influence the effectiveness of one-to-one interventions to result in client adherence. The second stage tested this theory using a narrative synthesis approach. Eleven studies across the health care arena were included in the synthesis and explored the interplay between client attachment style, client-provider interaction and client adherence with health interventions. It emerged that adherence results substantially because of the relationship that the client has with the provider, which is amplified or diminished by the client's own attachment style. This occurs because the client's attachment style shapes how they perceive and behave in relationships with the health-care providers, who become the 'secure base' from which the client accepts, assimilates and adheres with the recommended health intervention. The pathway from one-to-one interventions to adherence is explained using moderated mediation and mediated moderation models.

Introduction

One-to-one health interventions to promote adherence with health advice and therapeutic regimes has in recent years been revisited [1-3]. Systematic reviews suggest that there is evidence to support the view that one-to-one interventions may change clients' dietary behaviours [4], increase choice [5] and modify lifestyle [6]. Careful examination showed that while in some instances advice was readily adopted and incorporated into behaviour, in other examples interventions had no impact or resulted in short-lived behaviour change in some and long-term change in others [7]. The evidence for the effectiveness of one-to-one interventions appeared to be variable and misleading and was thought to be due to the 'intervention-specific' focus of systematic reviews [8, 9], which resulted in important insights with regard to context and interpersonal factors to be omitted. In order to address interpersonal factors and the context in which the intervention occurred a theory led narrative approach was utilised [10].

Aim and objectives

The aim was to use a theory led narrative approach to identify what affects successful one-to-one interventions i.e. client adherence. Stage one proposes a theoretical formulation to explore factors which intentionally or unintentionally influence client adherence following one-to-one interventions. Stage two tests this theory using disparate sources of evidence (published or otherwise) across the health care arena.

Methods

A theory was proposed which provided guidance for reviewing the literature and facilitated the organisation of data [11]. A systematic screening of the literature was undertaken to

identify studies relevant to the theory proposed. Data was extracted from included studies and relationships within the data were grouped under themes to explore the theoretical possibility of the proposed pathway and to understand factors influencing client adherence following one-to-one health interventions.

Theoretical formulation

Client adherence can be considered an outcome of the interplay between client and health provider [12]. The idea that it is the quality of the interaction between participants which impacts on client adherence was first described by Szasz and Hollender [13]. Specific aspects of the interaction have been highlighted as important, with client previous experience and social influence impacting upon how clients perceived the providers' affective support, the provison of decisional control and how health information was conveyed [14]. Nathanson et al. [15] suggested that it was the ability of the provider to convey a sense of trust,confidentiality, warmth and emotional support together with a non-directive approach that improved the quality of the interaction. Being able to explain, listen, and assist with problem solving were perceived as the crux of the mutual-participation model, which paved the way for adherence with one-to-one health interventions [16, 17].

Central to client adherence is the treatment alliance [18], which is built on communication and trust. It is an adult to adult interaction between client and provider [19]. For Shattell et. al. [20] the provider and client unconciously bring their past relationships, experiences [14] and current life circumstance to the interaction. Therefore, for one-to-one interventions to be successful a treatment alliance must be formed and its maintenance, it is suggested, is influenced by the security of the clients' and providers' attachments [21-23].

In order to present this theoretical formulation in an accessible way, the client's and provider's attachment may be conceptualised as moderators that alter the relationship

between one-one interventions and adherence; and the complexities of their interaction as mediators of client adherence. Although mediators and moderators are traditionally tested statistically, this theory led narrative review aims to test the theoretical possibility of this pathway, to understand the intended or unintended effects of interpersonal interactions in influencing client adherence following one-to-one interventions.

The client's attachment style or the provider's attachment style are postulated to act as moderators to explain individual differences in client adherence, and in this way the unexpected findings from intervention studies could be explained by the moderator model (Figure 1). A moderator variable is an effect modifier [24, 25] and is postulated to work in two ways: (i) the client's own attachment style influences how they perceive and interact with the provider to accept the intervention provided, (ii) the provider's own attachment style interacts with that of the client to influence the effect of the one-to-one interaction and ultimately client adherence. Finally, it is the dynamic relationship between client and provider that influences adherence and is hypothesised to work via the mediation model (Figure 2). Mediation is a relationship where an independent variable influences the mediating variable, which in turn influences the outcome. Mediation models are used to explain causal mechanisms and explore how an intervention produces an outcome [24, 25].

Therefore, the theoretical model proposed here is that (i) attachment could modify (moderate) the relationship between the one-to-one intervention and adherence, so that the success or failure of the intervention (adherence) varies according to the attachment style of the client, or (ii) the attachment style of the provider. In addition, (iii) the client-provider relationship could act as a mediating variable in the causal pathway to explain how one-to-one interventions lead to client adherence.

This review focuses on attachment style and patient-provider relationship to understand adherence to one-to-one health interventions. However, these factors may not act in isolation and consequently not explain all of the variance in the outcome. The timing or

sequence of the intervention and its components are important aspects that may also determine the success of an intervention outcome. Other important influences on adherence include socio-demographic factors (ethnicity, socioeconomic status, social support), psychological factors (stress, anxiety, depression), as well as disease specific and treatment-related factors (health beliefs, nature and complexity of prescribed regimen) [12, 26-29]. These other influences will not be addressed in this review.

Searching the literature

The electronic data bases searched were: MEDLINE and CINAHL plus (accessed via the interface EBSCO host), SCIRUS, SCOPUS and PsycARTICLES (Table I).

Initial scoping searches revealed that social relationships were relevant to both attachment and client adherence. Various terms were used in the literature to describe social relationships in relation to health. Therefore, the search used broad search terms that ensured comprehensive coverage (Table I). Initial screening of the retrieved articles revealed that the client provider-relationship was a form of social relationship especially pertinent to client attachment style and adherence. A consensus was reached to include primary studies (not including case studies), published in the English language and addressing the role of attachment and client-provider relationship with adherence, within the same study. Therefore, a second search was conducted for all articles on attachment to minimise the chance of missing relevant articles. All abstracts were then screened by SN and RF independently and 27 citations that broadly addressed the research question were identified and full texts obtained. An additional eight citations were found from the reference lists of the identified publications. The 35 full texts were read and re-read by SN and RF and the inclusion criteria applied. This resulted in 11 studies being included in the review (Figure3).

The study outcomes included in the synthesis range from improved treatment effects (weight loss) to adherence with treatment recommendations (diabetic self-care activities) and are henceforth referred to as 'adherence with one-to-one interventions'. The rationale for combining the two types of outcomes is that they are both the result of one-to-one interventions and the interplay between client and provider. Including studies that look at a range of different health outcomes allows us to assess different intentional or unintentional contextual factors that could influence adherence.

Quality appraisal

Studies were included based on relevance and rigour (9). A study was deemed to be relevant if it addressed the theory being tested. The rigor of a study was testament to the credibility of inferences drawn from that study [9]. Quality was assessed using a modified version of the tool 'Systematic Appraisal of Quality in Observational Research' (SAQOR) [30] for observational studies and the NICE checklist [31] for qualitative studies.

Data extraction and synthesis

A data extraction template based on the proposed theoretical framework was used to extract data relating to client attachment style, provider attachment style, client-provider relationship, adherence and the relationships between the three. Descriptive information, research methods, measures of study variables and main findings were also extracted, this assisted in assessing the relevance of study data for answering the research questions (Table II).

Following appraisal of the selected studies to consider their relevance to the theory under consideration, the extracted data was organised into themes based on the initial models proposed in the theoretical formulation. As the synthesis progressed the initial theory was

refined until a final model emerged of the intended or unintended effects of interpersonal interactions in influencing client adherence following one-to-one interventions.

Results:

Eleven studies were included in the synthesis. Outcome measures of adherence included weight loss [32]; length of retention and treatment completion for drug rehabilitation [33]; pain management, satisfaction and compliance [34]; reduced depression scores [35, 36]; client's progress in therapy [37, 38]; diabetic self-care activities [39-41]; and treatment adherence, satisfaction with care and health related quality of life in patients with SLE [42].

A descriptive summary of included studies is presented in Table II. All studies were found to be relevant to make credible contributions to testing the proposed theoretical models.

Synthesising the evidence to explain what works for whom and under what circumstances

The underlying assumption is that within a particular context a particular characteristic such as attachment style triggers specific mechanisms such as the client-provider relationship, which can bring about a change (adherence) [9]. Based on this principle, the evidence was synthesised to identify a common underlying causal mechanism which could explain why some clients were adherent and others were not.

Theme 1: Client attachment style moderating the relationship between one-to-one intervention and adherence

In support of the client attachment style moderator model (Figure 4), nine studies [32, 34-37, 39-42] observed that clients with secure attachment were more adherent with one-to-one

interventions, and clients with insecure attachment had poorer adherence. However, two studies [33, 40] noted unintentional outcomes. Preoccupied attachment, a type of insecure attachment characterised by a negative view of self and a positive view of others, was associated with greater adherence with diabetic treatment recommendations [40]. In another study, early dropout (non-adherence) was observed in securely attached clients undergoing residential drug rehabilitation [33]. Careful examination showed that a complexity existed with regard to attachment style and client adherence. It seemed that contextual factors appeared to impact on the moderating effect of client attachment style. The study authors proposed that because preoccupied attachment is characterised by a focus on pleasing significant others, a desire to please the health care provider led the preoccupied client to adhere with the provider's recommendations. The provider becomes the 'significant other' in a long term relationship such as diabetic care [40]. Similarly, the unexpected early dropout observed in the drug rehabilitation study may have been a result of secure clients perceiving better psychosocial resources, which made them feel ready to leave treatment before the formal end of the programme [33]. Therefore, client attachment style appeared to act as a moderator, but the type of attachment style that led to adherence appeared to be context dependent.

Theme 2: Client-provider relationship moderating the relationship between attachment and adherence

Good patient–provider communication was able to change the expected relationship between insecure (dismissing) attachment and poor adherence [41]. When the patient-provider relationship was positive, adherence with health interventions was observed even in patients with insecure attachment styles [41]. Therefore the quality of this relationship modified the expected relationship between client attachment and adherence (Figure 5).

Theme 3: Client-provider relationship mediating the effect of the one-to-one intervention on adherence

Better adherence was observed when the quality of the relationship between the client and the provider was positive [33-35, 37-40, 42]. Here the client-provider relationship is hypothesised as mediating the influence of the health intervention on adherence (Figure 6). Mediators and moderators are often differentiated based on temporality [43]; here temporality was theoretically determined because the health intervention preceded formation of the relationship between the client and provider. Therefore, we can postulate that the one-to-one intervention influenced the client-provider relationship and this was responsible for client adherence (Figure 6). Alternately, if the client and provider already had a professional relationship, and at a later stage the provider introduced a health intervention, then the existing relationship would act as moderator and not a mediator.

Theme 4: Client-provider relationship mediating the effect of client's attachment style on adherence

There was overwhelming support [34, 37, 39, 40, 42] for another mediation model, the proposition that the quality of the client-provider relationship mediates the relationship between client's attachment style and adherence. This was demonstrated statistically in two studies [37, 40], while three others [34, 39, 42] showed that client's attachment style was related to the patient-provider relationship, which in turn was related to adherence; thus theoretically fulfilling the criteria for mediation [24]. Therefore, the client's attachment style affects their adherence with health interventions via the quality of the relationship they have with the provider i.e. the client's attachment style influences the quality of the client-provider relationship, which in turn influences adherence (Figure 7).

Synthesis of the themes and refinement of theory

Although the themes that emerged pointed towards the relevance of using the principles of mediation and moderation to explain how, when and why clients were adherent, it also became apparent that none of the models acted in isolation, neither were they mutually exclusive. Rather, adherence resulted as a consequence of both direct and indirect pathways and a complex combination of mediation and moderation. Expanding this logic we proposed that the intervention resulted in adherence through theoretical combinations of the mediation and moderation models, such as mediated moderation and moderated mediation [44].

A moderated mediation effect (Figure 8) is where the client-provider relationship is chiefly responsible for influencing adherence, but its influence is dependent on the client's attachment style i.e. the outcome is different for people with different attachment styles. In other words, the intervention would result in adherence substantially because of the quality of the client-provider relationship, but this effect would be greater when the client was securely attached, although other attachment styles could also result in better adherence based on context, as demonstrated earlier [33, 40].

Client adherence could also result from an inherently similar process, mediated moderation (Figure 9) [44], where the client's attachment style modifies the likelihood of client adherence overall, but its effect is mediated via the quality of the client-provider relationship. Here a securely attached client is more likely to be adherent to the one-to-one intervention and this effect is enhanced by their ability to engage and connect effectively with their health care provider.

The last two models are essentially "two sides of the same coin" [44]. The two processes are very closely related and can only be distinguished in studies with appropriate design and statistical analysis. As succinctly put by Muller et al. (2005) *"*In talking about that coin, we can either concentrate on describing each side in turn, or we can recognise that they both

define the common coin." We propose that the pathway to adherence cannot be explained by a single model, but a combination of moderated mediation and mediated moderation models is in keeping with the complexities that underlie human behaviour and interpersonal interactions.

Discussion and conclusion

During the synthesis process evidence emerged that supported more complex models, rather than the more straightforward mediation and moderation models proposed in the initial theoretical formulation. In an attempt to tease out the complexities of the causal pathway and to explain how, when, and why clients are adherent, the synthesis process initially identified a series of simple models: moderator effects of client attachment style; moderator effects of client-provider relationship; and mediator effects of the client-providing relationship. The theoretical formulation was expanded and the principles of moderated mediation and mediated moderation were adopted to explain the complex interlinking of processes and explain how a sequence of events acts in combination to produce adherence.

Using this refined theoretical concept we hypothesise that adherence succeeds substantially through the quality of the client-provider relationship, which enhances the ability of the provider and patient to work together towards a common health goal. This is supported by evidence from reviews and meta-analyses, which have shown that this adult-to-adult relationship is a consistent predictor of health outcomes and patient adherence with treatment and therapeutic regimens [45, 46]. It is proposed that communication provides the psychosocial scafolding for this client-provider interaction. Communication factors act via a conscious pathway to improve the quality of this relationship. However, other unforeseen or unintentional factors located within the provider and client have the potential to affect the quality of the interaction and the success of the one-to-one intervention. Therefore, we refined this theory by demonstrating that the relationship between receiving an intervention

and adhering to it was influenced by the relationship between the client and provider, and this effect was enhanced or reduced by the client's attachment style which influenced how they perceived and interacted with the provider and the treatment provided. Therefore, if the client is securely attached, the benefits of a positive relationship with the provider are greater, while if the client is insecurely attached, the benefits are reduced. Clients who are securely attached often have better relationships with the health care providers [47, 48] because securely attached adults have positive views of themselves and others which allows them to engage and connect effectively with people to build long-lasting relationships. However, insecurely attached adults have the tendency to have a negative view of themselves and those they come into contact with, making them distrustful of engaging effectively with the provider [49-54]. In such cases the provider's own attachment style could interact with that of the client to modify the expected outcome. For example, a provider who is securely attached and responsive to the client's emotional needs can re-address the balance, and ensure that the insecurely attached client's anxiety and approach-avoidance behaviour is contained within the client-provider relationship. In this way the dynamic interplay between client and provider positively influences the therapeutic outcome [41, 55, 56]. None of the studies included in this review assessed the provider's attachment style and therefore this model could not be explored further.

It is impossible to say if client adherence is chiefly determined by an overall modifying effect of the client's attachment style, which is then facilitated via the client-provider relationship (mediated moderation model); or if adherence to the one-to-one intervention is chiefly enabled via the client-provider relationship, which is then modified by the client's attachment style (moderated mediation model). Therefore, we propose that these pathways are not mutually exclusive but are in fact "two sides of the same coin" [44].

Using these two models we can hypothesise about 'how', 'when', and 'why' clients are adherent. The 'how' of adherence with any one-to-one intervention is largely enabled by the relationship that the client has with the provider. 'When' the client is already securely

attached the influence of the patient-provider relationship is enhanced, therefore the effect is amplified by the client's own attachment style. The 'when' occurs because the client's attachment style shapes how they perceive and behave in relationships with the health-care provider who becomes the 'secure base' [54], which is 'why' the client accepts, assimilates and adheres with the recommended health intervention.

We are aware that there are a host of other factors, not measured in the included studies, which could influence the mechanisms of action and the outcome. However, the work presented here starts to unpack the complexities of factors that enable successful adherence with one-to-one interventions and suggests the need for providers to acknowledge and recognise that clients have different emotional and cognitive capabilities that influence their interactions with them. Recognising this will allow providers to tailor their care according to their client's needs.

In certain contexts the relationship between client attachment and adherence may not be straightforward or in the expected direction. Of relevance are cases where preoccupied clients adhere to recommendations chiefly to please their providers [40]. The danger is that adherence based on pleasing others may be short lived. Therefore, knowledge of client attachment could prepare providers to anticipate different behaviours, allowing tailoring of interventions to prevent relapse in times of difficulty.

Future studies need to explore the role of the provider's own attachment style in influencing client adherence. Additionally, if a greater understanding of the moderated mediation and mediated moderation pathways are to be realised, statistical approaches should be considered.

The adoption of a theory led narrative approach has provided helpful insights into how interpersonal factors operate and interact with one another, either intentionally or otherwise, to impact on client adherence. It has permitted an examination of how attachment may

influence client adherence while at the same time exploring the client-provider context in which the intervention took place. This permits a greater understanding of the how, when and why, which would otherwise be ignored with traditional systematic review type methodologies [8, 9].

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Figure 1 Moderation model

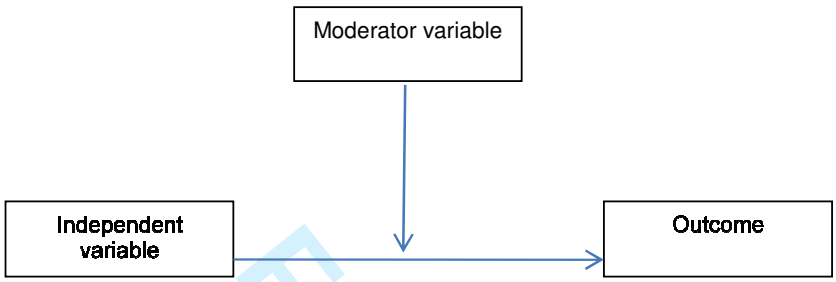

Figure 2 Mediation model

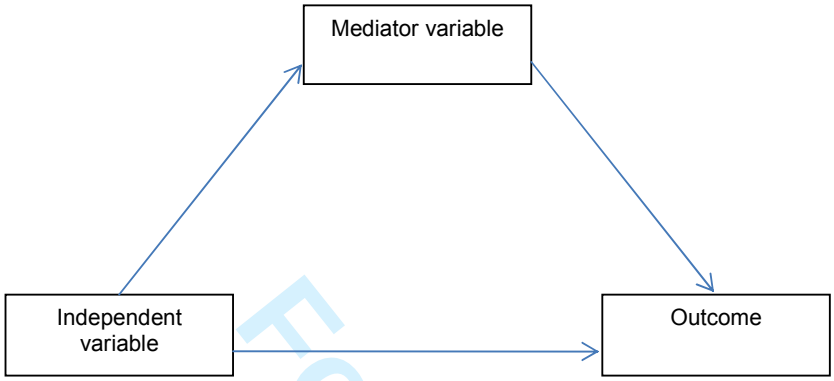

Table I. Search strategy

Search	Limiters	Years [no limits set]	Data base	Number of articles retrieved	Date of Search
TX [adher* OR compl*] AND TX social AND TX Attachment	Expanders - Apply related words; Also search within the full text of the articles Search modes - Boolean/Phrase		Interface - EBSCOhost Search Screen - Advanced Search Database - CINAHL Plus	411	16/05/12
TX [adher* OR compl*] AND TX social AND TX attachment	Search modes - Boolean/Phrase Limiters - English Language		Interface - EBSCOhost Search Screen - Advanced Search Database - MEDLINE	[887]	15/05/12
"secure attachment" +[adherence OR compliance OR comply OR adhere] +social	[filtering by journal sources only]		SCIRUS	382	14/5/12
[TITLE-ABS-KEY[adher* OR compl*] AND TITLE-ABS-KEY[social] AND TITLE-ABS-KEY[attachment]	Title, abstract, keyword	1960-2012	SCOPUS	1213	16/05/12
attach*:Any Field AND social:Any Field AND adher* OR compl*:Any Field	Any field		PsycARTICLES	101	14/05/12

Figure 3 Flow diagram illustrating search process and study selection

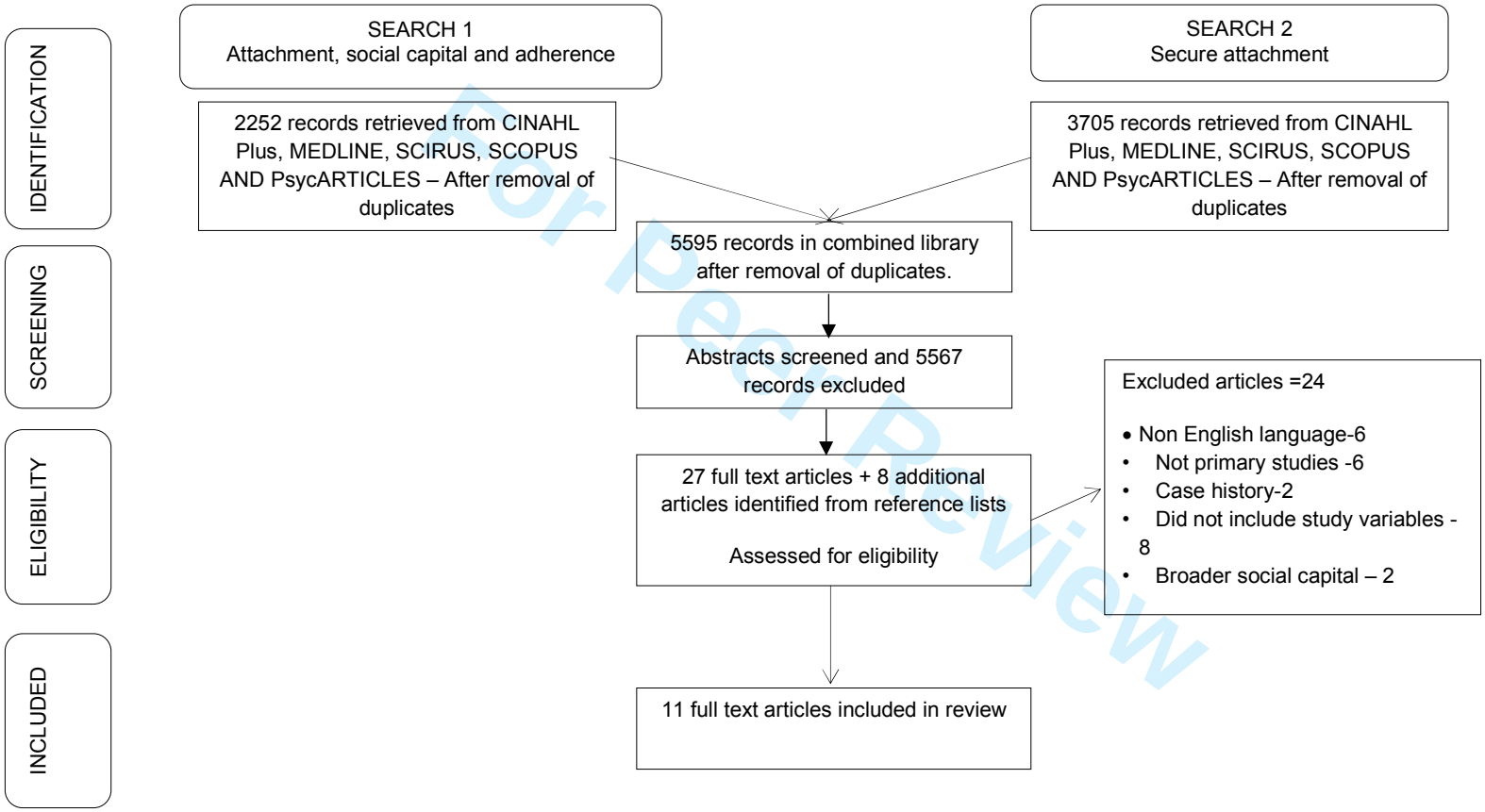

Table II. Studies included in the review

Study reference, design and participants	**Sample characteristics and study context**	**Study aim**	**Measures of attachment and patient-provider relationship.**	**Outcome measures**	**Results/ main findings**
Kiesewetter *et al*. [32] Longitudinal design Clinical outcome trial 12 months duration Obese patients	Germany N=44 [F=40; M=4] Mean age = 52.3 ± 10.5 12 month weight reduction lifestyle intervention.	Influence of attachment styles/patient – provider relationship on long term success of life-style obesity interventions.	Adult Attachment Prototype Rating. German version [57]. Semi structured interview. Secure, preoccupied dismissing types. Assessed at baseline. Helping Alliance Questionnaire German version [58, 59]. Self-report by both patient and provider. Assessed after 3 group sessions.	Weight loss	1. Secure attachment greater weight loss than insecure attachment. 2. Secure patients more positive assessment of patient-provider relationship than insecure patients. Therapist agreement. 3. No significant relationship between weight loss and patient-provider relationship.

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
Ciechanowski *et al*. [40] Cross sectional design Diabetic participants	USA N=4095 [F= 1981;M=2114] Mean age= 62.5 ± 13.7 Mail survey of all patients with diabetes from 9 primary care clinics.	Role of attachment styles and patient-provider relationship on self-management in diabetic patients.	Relationship Questionnaire [60]. Assessed secure, preoccupied, fearful and dismissing types. Adapted 3 items from a measure for assessing patient perception of provider support for self-management of bipolar disorder [61].	Diabetes self-care, smoking status, oral hypo-glycaemic adherence, glycaemic control.	1. Patients with dismissing attachment style more likely to have lower levels of exercise, foot care, healthful diet, more likely to smoke and be non-adherent with oral hypoglycaemic medications, but not glucose testing, compared to patients with secure attachment style. Patients with fearful attachment style less likely than patients with secure attachment style to exercise. Patients with preoccupied attachment style less likely to have poor glycaemic control compared with those with secure attachment style. 2. Greater patient-provider collaboration among those with secure attachment style compared to those with fearful and dismissing but not preoccupied attachment styles. 3. Greater patient-provider collaboration associated with better adherence to diet, exercise, foot care, oral hypoglycaemic medications, better glycaemic control and

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
					negative smoking status. 4. The patient-provider relationship mediated: a] relationship between dismissing attachment style and poorer adherence to health promoting behaviours. b] relationship between fearful attachment style and poor adherence to exercise. c] relationship between preoccupied attachment style and better glycaemic control.
Ciechanowski *et al*. [41] Cross sectional design Diabetic participants	USA N=367 [F= 204; M=163] Mean age = 61.3 ± 11.9 Study took place in two primary care clinics.	Role of attachment style on adherence and whether the patient-provider relationship modified the attachment-adherence relationship.	The Relationship Scales Questionnaire, and the Relationship Questionnaire [60]. Assessed secure, preoccupied, fearful and dismissing types. The Patient Reactions	Variation in glucose control based on glycosylated haemoglobin	1. Patients exhibiting dismissing attachment had significantly higher glycosylated haemoglobin levels than did patients with preoccupied, secure and fearful attachment styles. 2. No significant association between patient -provider communication quality and glucose control. 3. Patients with dismissing attachment who perceived that poor quality communication with their provider had higher glycosylated haemoglobin levels than those with a

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
			Assessment [62]. Assessed patient-provider communication quality.		dismissing attachment style who perceived their provider's communication good. No significant differences in glycosylated haemoglobin levels by communication quality in the patients with secure, preoccupied, or fearful attachment styles.
Bennett *et al*. [42] Cross sectional design SLE patients	USA N=193 [F= 188; M=5] Mean age = 42.51 ± 9.48 Online survey recruiting from lupus oriented, English language, websites.	Relationship between patient-provider relationship and attachment styles, and adherence, satisfaction, and health-related quality of life.	Experiences in Close Relationships Scale [63]. Assessed anxiety and avoidance. The Physician–Patient Alliance Inventory [64].	Adherence with treatment, satisfaction with care and health related quality of life.	1. Attachment anxiety and avoidance negatively correlated with adherence. 2. Participants who manifested lower attachment anxiety and lower attachment avoidance reported stronger relationship with their physician. 3. Strong positive correlation between the patient – provider relationship and adherence.
Meier *et al*. [33]	USA	Role of the [early]	Modified version of the	Length of	1. Secure attachment was associated with shorter

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
Longitudinal design Drug rehabilitation	N=187 [F=57; M=130] Median age= 29.6 Clients starting residential rehabilitation treatment for drug misuse in 3 UK services between August 2002-August 2003	therapeutic alliance in predicting length of retention in residential drug treatment. Client attachment style treated as a confounder.	Relationship Questionnaire [65]. Assessed secure, preoccupied, fearful and dismissing types; at baseline. Modified short 12-item client and counsellor version of the Working Alliance Inventory [66]. Assessed weekly, weeks 1 to 3.	retention and treatment completion [90 days]	retention [earlier dropout]. 2. Study did not look at association between attachment and patient –provider relationship; rather they treated it as a confounder and not part of the causal pathway. 3. Counsellor rated alliance, but not the client rated alliance, significantly predicted length of retention.
Bliss [34] Longitudinal design	USA N= 59 [F= 39; M= 20] Mean age = 47.47 ± 14.14	PhD dissertation. Attachment, depression and working alliance examined as	The Adult Attachment Scale [67]. Assessed comfort with closeness, comfort depending on others and rejection	Change in pain severity, pain interference, patient satisfaction with	1. Secure attachment positively correlated to patient adherence. 2. Secure attachment was positively related to the patient-provider relationship. 3. Patient-provider relationship was positively correlated

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
Chronic pain patients	Participants recruited at 4 outpatient physical therapy clinics in two cities.	predictors of treatment outcomes in chronic pain patients receiving physical therapy.	anxiety; at baseline. Short version [12 items] of the Working Alliance Inventory [66]. Assessed 5 weeks from first visit.	physical therapy services and adherence with treatment recommendations.	to patient adherence. 4. Depression was found to be a mediator in the relationship between secure attachment and patient-provider relationship.
Smith *et al*. [35] Longitudinal design Depression patients with a history of childhood	USA N= 70 [women] Mean age = 36.39 ± 9.86 Women seeking treatment in a community mental health centre who	Effects of attachment style and the patient-provider relationship on treatment outcomes among depressed women with childhood sexual abuse	Experiences in Close Relationships scale [63]. Assessed avoidance and anxiety; at baseline. Working Alliance Inventory [68]. Assessed after third therapy session.	Change in depression scores. Number of sessions attended.	1. Patients with less attachment avoidance reported greater improvements in their depressive symptoms at the end of treatment. Attachment anxiety was not associated with changes in depressive symptom severity over time. 2. No association between attachment and patient-provider relationship. 3. Patients with more positive relationships with their therapists reported fewer depressive symptoms at treatment conclusion.

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
sexual abuse	had Major Depressive Disorder and a childhood sexual abuse history.	histories.			4. Mediation could not be assessed statistically as no relationship was observed between attachment and patient-provider relationship.
Byrd *et al*. [37] Longitudinal naturalistic design Students attending therapy for various problems	USA N=66 [F=39; M=27] Mean age =22.66 ± 6.41 Data from an archival database of clients seen in an outpatient training clinic.	The patient-provider relationship was hypothesised to mediate relationship between attachment style and psychotherapy outcome.	Adult Attachment Scale–revised [67, 69]. Assessed comfort with closeness, comfort depending on others and rejection anxiety; at baseline. Working Alliance Inventory–Short Form Revised [70]. Assessed after each therapy session.	Patient progress in therapy.	1. Positive association between comfort with closeness and progress in therapy, and comfort depending on others and progress in therapy. No association between rejection anxiety scores and progress in therapy. 2. Positive association between comfort with closeness and patient-provider relationship, and comfort depending on others and patient-provider relationship. No association between rejection anxiety scores and patient-provider relationship. 3. Positive association between patient-provider relationship and progress in therapy.

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
					4. Patient-provider relationship partially mediated effect of comfort with closeness on progress in therapy and comfort depending on others and progress in therapy.
Reis and Grenyer [36] Longitudinal design Severely depressed patients	Australia N=58 [F=34; M=24] Mean age = 45.98 ± 10.97 Clients receiving psycho-therapy for depression at an outpatient university clinic.	Examined links between adult attachment styles, patient-provider relationship and treatment response in clients receiving psychotherapy for major depression.	Relationship Questionnaire [65]. Assessed secure, preoccupied, fearful and dismissing types; at baseline. Working Alliance Inventory [68]. Assessed following third therapy session.	Change in depression scores over the course of therapy.	1. Individuals reporting high levels of fearful attachment showed less improvement. No significant associations between other attachment styles and treatment response. 2. Secure attachment associated with more positive ratings of the patient-provider relationship: dismissive attachment predicted more negative ratings of the patient-provider relationship. No relationship between fearful or preoccupied attachment and patient-provider relationship. 3. No significant relationship between patient-provider relationship and change in depression. 4. Patient-provider relationship not mediator in relationship between attachment and outcome.
Sauer *et al*. [38]	USA N=95 [F= 65;	Examined how attachment and	Experiences in Close Relationships Scale [63].	Progress in therapy, changes	1. Neither attachment anxiety nor avoidance helped explain clients' distress levels across time.

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
Longitudinal design Clients receiving therapy	M=30] Mean age = 27.71 ±11.39 Clients from 2 psychology training clinics at a university.	patient-provider relationship impacted on change in psychological distress across time.	Assessed Avoidance and Anxiety; at the third counselling session. Working Alliance Inventory Client version [68]. Administered at the third counselling session.	in symptom distress.	2. Clients who reported stronger relationships with their providers reported greater reductions in distress over time.
Ciechanowski and Katon [39] Qualitative study Diabetic participants	USA N=27 [F=16; M=11] Mean age = 54.47±11.8 Patients with type 2 diabetes attending a	Qualitative exploration of experiences of patients with type 2 diabetes in their interactions with the health care system in managing diabetes,	Relationship Questionnaire [60]. Assessed secure, preoccupied, fearful and dismissing types; at baseline. Qualitative semi structured interviews to assess trust of health care providers and	Patient health care utilization patterns including engagement, reluctance to seek care, leaving care, frequently changing providers, playing	1. Patient attachment style and capacity to trust influenced health care utilization patterns. 2. Patients with secure attachment style more likely to trust providers and value on-going relationship, even if circumstances not ideal. Patients with fearful attachment style highly attuned to indications of rejection and patients with dismissing attachment style highly sensitive to being controlled. 3. Patients with dismissing and fearful attachment styles

Study reference, design and participants	Sample characteristics and study context	Study aim	Measures of attachment and patient-provider relationship.	Outcome measures	Results/ main findings
	university care centre.	while taking into account their attachment style and relationship with health care provider.	satisfaction with interaction with health care providers.	a 'role' or 'game' to tolerate care.	reported perceiving a power differential between providers and patients that threatened their ability to engage in the health care system. 4. Study observed that the attitude, clinical approach and behaviours of providers could potentially enhance capacity for patients with dismissing or fearful attachment style to trust or engage with the health care system.

Figure 4 Client's attachment style moderating the relationship between one-to-one intervention and adherence

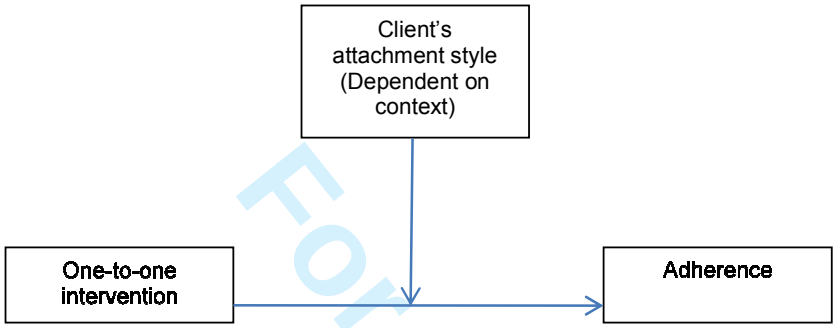

Figure 5 Client-provider relationship moderating the relationship between client's attachment style and adherence

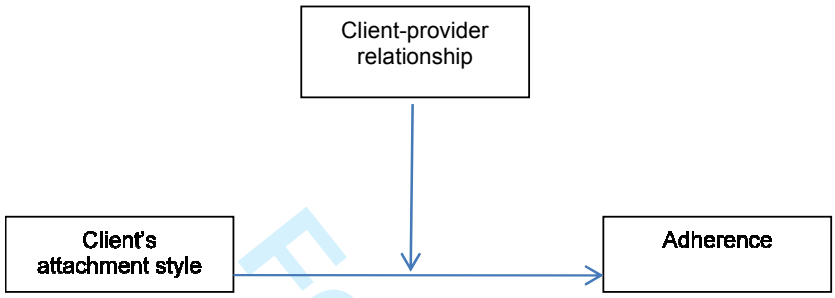

Figure 6 Client-provider relationship mediating the effect of the one-to-one intervention on adherence

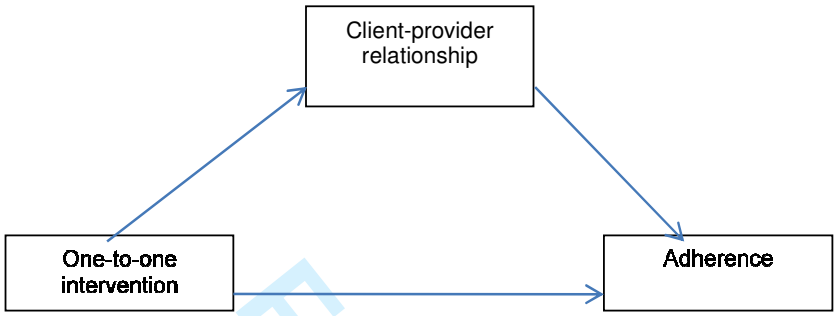

Figure 7 Client-provider relationship mediating the effect of client's attachment style on adherence

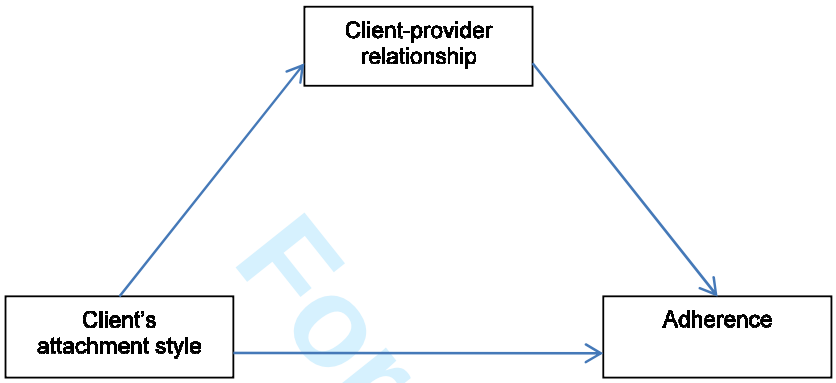

Figure 8 Moderated mediation model

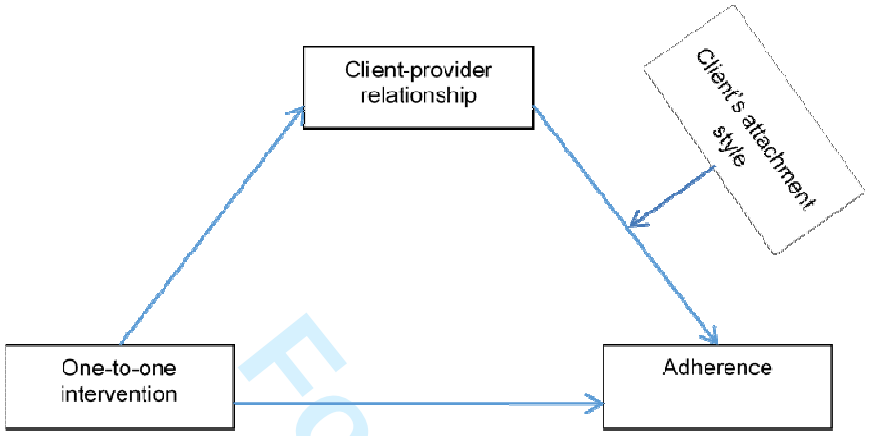

Figure 9 Mediated moderation model