PATIENT CONTRACTS FOR CHRONIC CONDITIONS

A SCOPING STUDY TO DESCRIBE 'FOR WHAT' AND 'HOW' PATIENT CONTRACTS ARE BEING USED IN THE SCIENTIFIC LITERATURE FOR THE MANAGEMENT OF CHRONIC MEDICAL CONDITIONS

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A Thesis Submitted to the School of Graduate Studies in Partial Fulfillment of the Requirements for the Degree Master of Public Health

McMaster University MASTER OF PUBLIC HEALTH (2018) Hamilton, Ontario

TITLE: A Scoping Study to Describe ‘for what’ and ‘how’ Patient Contracts are Being Used in the Scientific Literature for the Management of Chronic Medical Conditions AUTHOR: Erin Gallagher, BHSc, MD, CCFP (PC) (McMaster University) SUPERVISOR: Assistant Professor Elizabeth Alvarez, MD, MPH, PhD, CMCBT NUMBER OF PAGES: 31, ix

Lay Abstract

Rates of chronic medical conditions continue to rise in North America. To manage such conditions, medical professionals commonly use patient contracts, defined as any type of agreement by which one or both parties agree to a set of behaviors related to the care of the patient. The purpose of this study is to describe 'for what' and 'how' medical contracts are being used for the management of chronic medical conditions. A scoping literature review was undertaken. Extensive variety was seen in the literature for contract target population, clinical setting and co-interventions. Purposes for initiating contracts included: 1) behavior change and skill development; 2) altering beliefs and knowledge; 3) improving interpersonal relationships; 4) improving the quality and process of care; and 5) altering objective and subjective health indices. Contract development and implementation processes were inconsistently described. More research is required to determine if contracts are capable of accomplishing their intended purposes. Questions remain regarding their rationale, development and implementation processes.

Abstract

Introduction: Prevalence of chronic conditions continues to rise in North America. Despite the lack of evidence supporting their use, patient contracts are commonly used by medical professionals to manage such conditions. To date, literature reviews on patient contracts has been limited to randomized controlled trials, with specific purposes and limited populations. The purpose of this study is to describe 'for what' and 'how' medical contracts are being used for the management of chronic medical conditions.

Methods: In order to capture and describe the breadth of knowledge around medical contracts in the literature, a scoping review was conducted. This inclusive approach allowed for analytic reinterpretation of research activity, gaps in the literature to be identified and further avenues of inquiry to be opened. Database searches included Medline, EMBASE, AMED, PsycINFO, Cochrane, CINAHL and Nursing & Allied Health.

Results: A total of 7,528 articles resulted from the original search. Seventy-six articles were included in the final review. Multiple types of studies were represented with limited follow-up durations. Extensive variety was seen for contract target population, clinical setting and co-interventions. Purposes for initiating contracts included: 1) behavior change and skill development, including goal development and problem solving; 2) altering beliefs and knowledge,

including motivation and perceived self-efficacy; 3) improving interpersonal relationships and role clarification; 4) improving the quality and process of chronic care; and 5) altering objective and subjective health indices. In relationship to how contracts are used, their development, application of behavioral theory, inclusion of patient input, training for their use and implementation processes were inconsistently described.

Conclusion: More research is required to determine if contracts are capable of accomplishing their intended purposes. Questions remain regarding their rationale, development and implementation.

Acknowledgments

I would like to thank my supervisor, Dr. Elizabeth Alvarez, who recognized the potential for a Master's thesis in a class project, contributed her own ideas and guided me through the research process; Drs. Lydia Hatcher and Dale Guenter who sat on my thesis committee, provided excellent constructive criticism and resources as well as supported me along the way; Dr. Fran Scott, my program director, who always made herself available for guidance and support; Lin Jin and Bethina Louiseau who aided with article selection and the iterative process of data extraction; Cindy Chen who participated in article selection; and my husband, Jeremiah Pike, who supported my family and I throughout the entire process.

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Declaration of Academic Achievement

To date, research has neither supported nor refuted the use of patient contracts for the purpose of managing chronic medical conditions. This project summarizes 'for what' and 'how' these contracts are being used in the scientific literature. Through the application of well-defined scoping review methodology, key concepts underpinning this complex research area could be extracted, allowing for thematic analysis of the literature. Data extraction and interpretation were enhanced, and the results made more useful, through a process of consultation with content experts and practitioners. Working with interdisciplinary colleagues and learners allowed for increased breadth and comprehensiveness as well as refinement of mentee/mentor skills of the thesis candidate. Having captured a broader understanding of patient contracts in the literature, important gaps have been highlighted, leading to further questioning around why and how they are being used. Dissemination of this newfound knowledge to policy makers, practitioners and consumers of chronic disease management processes will be an avenue for improving the quality of patient contracts and/or a push for finding more effective methods for managing chronic conditions. Avenues for knowledge dissemination will include publication in a relevant medical journal and presentation at medical and public health conferences.

Introduction

Within North America, the prevalence of chronic diseases such as heart disease, diabetes and obesity continues to rise at alarming rates.[1] According to the Centers for Disease Control and Prevention (CDC), in 2012 about half of all adults in the United States (117 million people) had one or more chronic diseases.[1] Furthermore, the 86% of all healthcare spending goes towards the management of people with one or more chronic medical conditions.[1] Complicating the matter are the unintended harms caused by specific treatments for various chronic conditions, such as abuse and diversion (selling or giving away of medications) following a prescription of opioid for chronic pain.

Primary care providers are bombarded daily on the front-line with the epidemic of chronic diseases. One approach used by many practitioners is the medical contract for managing chronic conditions, including mental health and pain.[3] A medical contract can be defined as "any type of agreement, verbal or written, by which one or both parties agree to a set of behaviors related to the care of the patient."[3] Most often, the parties involved in a medical contract are the patient and treating practitioner. In 2007, The Cochrane Collaboration conducted a systematic review of randomized controlled trials to assess the effects of contracts between patients and healthcare practitioners on patients' adherence to treatment, prevention and

health promotion activities.[3] They concluded that there was not enough reliable evidence to recommend the routine use of contracts in health services to improve patients' adherence to healthcare activities or other outcomes.[3] Similarly, in the 2016 Centers for Disease Control and Prevention Guideline for Prescribing Opioids for Chronic Pain, researchers found limited evidence regarding benefits and harms of risk mitigation approaches, including opioid contracts for preventing abuse and/or selling of opioids.[4]

To date, The Cochrane Collaboration publication is the only systematic review on medical contracts, which focused on randomized controlled studies with specific goals (adherence), further limiting their results to interventions in high-income countries.[3] Even within this subset, significant complexity and variety in medical contracts remains, making it nearly impossible to determine their overall effectiveness.[3] Trials testing contracts have demonstrated positive effects, particularly in the realm of substance addiction, however these trials are small and their quality uncertain.[3] Contracts have also been shown to be ineffective and in many cases, studies have failed to consider potential harms in their analysis.[3] Potential harms in using a contract approach could include unintended stigmatization of the patient or not taking into consideration the financial hardship an intervention entails. Despite their lack of reliable evidence, practitioners

continue to use medical contracts, adapting them to their setting, population and scope of practice.[3]

The breadth of knowledge around medical contracts has not been captured or described in the literature. A more inclusive and descriptive approach allows for: analytical reinterpretation of the extent, range and nature of research activity; identifies gaps in the literature; and opens up avenues for further inquiry. For example, discoveries around what is emphasized in medical contracts may prompt questions around their consistency with accepted models of human health behavior. The purpose of this study is to describe 'for what' and 'how' medical contracts are being used for the management of chronic medical conditions.

Methods

In order to describe the scientific literature on medical contracts, a scoping study was conducted following the Arksey and O'Malley (2005) methodology, as well as having incorporated suggested enhancements to the framework by Levac, Colquhoun and O'Brien (2010).[5,6] According to Arksey and O'Malley (2005), a scoping study tends to address a broad topic, incorporates many different study designs, addresses less specific research questions and does not assess the quality of incorporated literature.[5] In this sense, alignment of information from a variety of sources is more important than assessing quality of individual studies, as a fuller nature of inquiry is sought. Further to this, a scoping study may aim to: map key concepts underpinning a complex research area; provide a mechanism for analytic reinterpretation of the literature; and disseminate findings to policy makers, practitioners and consumers who require further information to make decisions.[5]

Study Identification and Selection: Relevant databases (Medline, EMBASE, AMED, PsycINFO, Cochrane Library, CINAHL and Nursing & Allied Health) were searched up to June 6th, 2017 using the search terms "contract" OR "contracts" in the title, abstract and article. As I became more familiar with the literature, exclusion terms were added through an iterative process to further

refine the search results (Appendix A: Final Database Search String). Two librarians from McMaster University were consulted in developing the search strategy and search string. The thesis committee, composed of physicians and public health professionals with expertise in the management of chronic disease, approved the final database search string. In order to balance feasibility with breadth and comprehensiveness, literature from 1997 and beyond were considered. This timeframe may also reflect a less paternalistic approach to medicine, being more consistent with current values and beliefs of North American society. Other limits included primary research in the English language. Inclusion criteria were articles describing the implementation of a patient contract by a healthcare provider for the management of a chronic condition. Contracts could include any verbal, written or electronic statement "specifying at least one treatment, prevention or health promotion activity to be observed."[3] Contracts could be between a patient and anyone in their care team, including a medical practitioner (physician, nurse, therapist, etc.), a caregiver or themselves. Contracts could be formulated in a variety of settings, including a hospital or clinic, community program or home. Chronic diseases could include those related to the cardiovascular system, lungs, kidneys, diabetes, nervous system, mental health and substance abuse, pain and obesity. Finally, articles had to measure or describe an outcome as a result of using the contract or intervention that included the contract. Exclusion criteria were articles: not in English; published before 1997;

addressing only medical contracts or a chronic disease, but not both; only addressing a process of informed consent to a treatment; not primary research; and the full article not being accessible to the researchers. A bibliographic software package (RefWorks) was used for tracking selected articles, the database in which they were found and the date the search was performed. My supervisor and I then separately reviewed the first 35 articles from the Cochrane database to assess for article inclusion. Articles were screened by title, abstract and full text depending on the need for further clarity. Articles initially disagreed upon were discussed in detail until consensus was reached. A detailed article selection protocol was then developed and 3 student volunteers were recruited to participate in the remainder of the article selection process. A subset of 30 articles through 2 iterations was reviewed together to ensure consistency and any discrepancies were resolved through discussion. Once the students and primary researcher were familiar and comfortable with the article selection protocol, the remainder of the articles were split between them for review and inclusion. Discrepancies continued to be settled through a process of consensus with the group.

Data Collection & Measurement: In Arksey and O'Malley's (2005) paper, they refer to the 'descriptive-analytical' method, "which involves applying a common analytical framework to all the primary research reports and collecting standard information on each study." Data was entered into a data charting form using the

database program Excel, focusing on general information (the 'for what') about the study (title, author, journal, year, country, type of study, chronic condition, setting, target population, contract parties and purpose of intervention) as well as the following general themes (the 'how'): development (contract name, if patient input was considered, if behavioral theory was considered, and if the development process was described); implementation (training, co-interventions, follow-up duration, and if the contract was further reviewed after initiation); and composition (elements, incentives and if patient goals were considered). The thesis committee collectively developed the data charting variables. Two volunteer students (involved in the article selection process) and I independently extracted data from the first 10 articles and then met to determine if our approach was consistent. Discrepancies were discussed and decisions reached through consensus. The students and I then divided up the articles and continued to meet biweekly to discuss articles requiring clarification. Again, a process of consensus was used to determine the extracted variable content.

Analysis: By applying a consistent charting approach to reporting the findings, trends and gaps could be revealed which allowed for more complex observations between sub groups. Descriptive statistics were used to summarize the extent and distribution of the studies included in the review. Some variables requiring qualitative input underwent thematic analysis, with the primary researcher

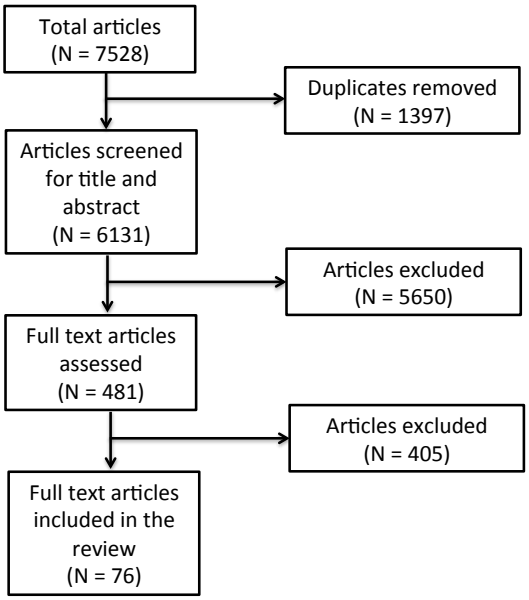
identifying as few main categories as possible for data efficiency. For example, the 'purpose of intervention' variable could be diverse in content but could be further broken down into main categories once familiarity with the literature was reached. The primary researcher consulted with all 3 student volunteers for approval of these main categories as they had also become familiar with the literature through article selection and data extraction.

Consultation: In discussing their methodology, Arksey and O'Malley (2005) highlight evidence suggesting that "systematic reviews can be enhanced, and the results made more useful, if practitioners and consumers contribute to the work."[7] My thesis committee included 3 primary care physicians with special interests in public health, chronic pain, mental health, addictions, models of health behavior and systematic reviews. This composition allowed for "the methodological and content expertise needed for decisions regarding breadth and comprehensiveness."[6] Through various modes of communication, I was able to reach out to my committee members to: 1) identify additional references; 2) validate the search strategy; 3) validate the findings; 4) inform future research; and 5) aid in knowledge translation.

Results

Of the 7528 articles resulting from the initial search, 481 articles received a full text review with 76 (1%) meeting inclusion criteria (Figure 1).

Figure 1. Stages of the scoping review of the literature.



General Information: All years from 1997 to 2017 had article representation: 21 articles from 1997 to 2003, 29 articles from 2004 to 2010 and 26 articles from 2011 to 2017. The greatest number of publications occurred in the United States (n=51, 67%), followed by the United Kingdom (n=4), Australia (n=3), France,

Canada, The Netherlands and Germany (n=2 each). Remaining countries with a single publication included Malawi, Korea, Portugal, Holland, Cameroon, Sweden, Puerto Rico, Norway, Japan and Thailand. The majority of study types included randomized controlled trials (n=42, 55%), followed by observational studies (n=23, 30%) and non-randomized interventional studies (n=11, 15%). A variety of chronic conditions was represented in the literature, with substance use disorder (n=26, 34%) and psychiatric disorders (n=17, 22%) comprising the majority (Table 1).

Table 1. Chronic conditions for which patient contracts were used and the names given to them.

Chronic Condition*	Contract Names**	Source***
Substance Use (marijuana, tobacco, alcohol, opioid)	contract, no-smoking agreement, deposit contract, behavioral continuing care contract, trilateral opioid contract, treatment contract, behavioral contract(ing), substance use disorder contract, monitoring contract, verbal contract, aftercare (participation) contract, moral contract, alcohol contract, antabuse contract, contingency contract, quit contract, substance monitoring contract, commitment contract	1, 2, 17, 19, 20, 22, 23, 24, 25, 27, 34, 38, 43, 45, 47, 48, 49, 53, 57, 60, 64, 65, 71, 73, 75, 76
Psychiatric Disorders (Suicidal, Borderline Personality Disorder, Depression, Post-traumatic Stress Disorder, Schizophrenia, Bipolar Disorder, Disruptive Behavior, Attention Deficit Hyperactivity Disorder, Dissociative Identity Disorder, Anorexia Nervosa)	contract(ing), contract for safety, no-suicide contract, behavioral continuing care contract, treatment contract, treatment plan, behavior(al) contract, mental and behavioral health contract, monitoring contract, therapeutic contract, weight contract, self-referral to inpatient treatment contract, parent-teen contract	4, 8, 10, 20, 26, 27, 31, 37, 38, 40, 43, 51, 56, 58, 59, 70, 72
Risk Factors (diet, exercise, obesity)	physical activity contract, behavioral contract, health contract calendar, contract for change tool, deposit contract, social support contract	3, 16, 29, 32, 39, 50, 74
Respiratory Diseases (Asthma, Chronic Obstructive Pulmonary Disease)	contingency contract(ing), behavioral contract, health contract, family contract, contract	9, 11, 18, 33, 41, 42, 54, 55, 69
Cardiovascular Disease (Angioplasty, Percutaneous Coronary Intervention,	behavioral contract, treatment contract, weight loss contract	11, 46, 61, 62, 63

Hypertension)		
Musculoskeletal Disorders (Osteoarthritis, Fibromyalgia)	patient contract, therapeutic contract, negotiated follow-up contract, physical activity maintenance contract, behavioral contract	12, 21, 36, 52
Infectious Disease (Human Immunodeficiency Virus, Hepatitis C, Latent Tuberculosis)	contract referral, treatment contract, contingency contracting	7, 27, 35, 44
Disabilities (intellectual, developmental, physical, neurological)	behavioral contract, contract, contingency contract	5, 6, 28, 68
Chronic Pain	medication contract, pain contract, medication contract/agreement, provider-patient agreement, opioid contract	13, 30
Organ Failure (dialysis, liver transplant)	health contract, self-contracting	14, 66
Diabetes	treatment contract, contingency contract	46, 67
Contact Lens Wearers/Glasses	health care contract	15

* Some articles covered more than 1 chronic condition.
** Some articles referred to contracts by more than 1 name.
*** See Appendix C for source.

The largest number of contract interventions was initiated in the community (n=32), followed by specialty outpatient medical clinics (n=24) and primary care medical clinics (n=18) (Table 2).

Table 2. Settings where contract interventions were initiated to manage chronic medical conditions.

Setting*	Frequency of Articles
Community (Pharmacy, Call Centre, Patient Home, Optometry Clinic, Public Health Clinic, School)	32
Specialty Outpatient Medical Clinic	24
Primary Care Medical Clinic	18
Inpatient Unit	4
Emergency Department	2
Unknown	1

* Some articles covered more than 1 setting.

The interventions typically targeted adults (n=57, 75%) with some directed at adolescents/young adults (n=11, 14%), children (n=2, 3%) and geriatric populations (n=5, 7%). One study did not specify the target age. The majority of contracts were between the patients and their health care provider(s) (n=51, 67%) (Table 3).

Table 3. Parties of contracts for managing chronic medical conditions.

Parties to the Contract	Frequency of Articles
Patient + Healthcare Provider	51
Guardian +/- Patient +/- Healthcare Provider	13
Patient + Peer +/- Healthcare Provider	5
Unknown	7

Contract Development: Contracts were referred to with multiple terms (42 in total) with the largest being contract(ing) and behavior(al) contract(ing) (n=17, 22%) (Table 1). Only 3 articles did not include the word contract, instead referring to a no-smoking agreement,[9] treatment plan[39] and medication/provider-patient agreement.[79] In general, the contract terminology identified the process of care or treatment, the purpose of the contract, parties to the contract or the contract as a tool.

Purposes for initiating contracts included:

1) behavior change and skill development, including goal development and problem solving. One example of a sub-category for behavior change included adherence, such as mandating a paraplegic patient to receive regular wound care prior to being accepted for a surgical intervention.[75]

2) Altering beliefs and knowledge, including motivation and perceived self-efficacy. One example of an intervention aimed at improving knowledge included an educational program for contact lens wearers regarding proper lens and eye care. [83]

3) Improving interpersonal relationships and role clarification. One example of an intervention aimed at improving relationships included a contract clarifying the roles of family members in managing the illness of their family member with schizophrenia. [40]

4) Improving the quality and process of chronic care. One example of a sub-category for improving quality and process of care is safety, such as a contract outlining the conditions for which controlled medications would be prescribed for the management of chronic non-cancer pain. [79]

5) Altering objective and subjective health indices. One example of an intervention aimed at improving health indices included a contract specifying goal weights for patients with anorexia nervosa. [38]

Only 11 articles (14%) described how the contract itself was developed. Thirty-three articles (43%) included patient input in devising the contract, although the range of initial input varied considerably. Finally, many theories of behavior were used to rationalize the use of a particular intervention, however it was not always clear if the theory was specific to the use of or to the development of the contract (Table 4). Only 15 articles (20%) mentioned a health behavior theory specific to the contract.

Table 4. Theories of behavior behind interventions aimed at managing chronic medical conditions using contracts.

Behavioral Theory	Source***
Social Cognitive Theory	5, 9, 18, 22, 29, 36, 42, 67
Behavioral Ecological Model	34, 35
Behavioral Economics	39, 75
King's Goal Attainment Theory	14
Kernberg's Theory for Transference e-Focused Psychotherapy	26
Behavior Modification Model	32

*** See Appendix C for source.

Contract Implementation: Eleven out of the 76 articles (14%) mentioned or described training specific to the contract for those implementing the intervention. Only 6 articles (8%) had a contract as the sole intervention. The majority of follow-up occurred for 1 year or less (n=57, 75%) with only 2 articles following patients for over 2 years. Follow-up duration could not be determined in 8 articles (11%). Only 16 articles (21%) described a process for reviewing the contract at a future date following its initial implementation.

Contract Composition: A number of easily identifiable elements existed within the contracts, including but not limited to: prescribed and forbidden behaviors, rewards/incentives, consequences, medication/treatment prescriptions, action plans, risks and benefits of treatment, schedules, threats/barriers to success and

techniques to overcome them, responsibilities of those signing the contract, instructions, education/rationales, goals/targets, social support for the patient and assessment of health status. Some form of incentive for the patient was used in 20 articles (26%). Examples of incentives included financial reward,[11,51,53] enjoyable activities[57] and the promise of further treatments.[75] Twenty-five articles (33%) included patient goals in the contract, which ranged from selecting them off of a menu to having full authority over what was to be accomplished.

Discussion

Main Points: The preceding results have highlighted extensive variety found in the literature regarding the use of patient contracts to manage chronic medical conditions. Although the majority of studies found in this scoping review were randomized controlled trials, the wide spectrum of conditions, co-interventions and contract elements they cover shed light on why to date there is limited evidence to support their use. The various names of the contracts and what they imply – a process of care, specific purpose, parties to the contract or the contract as a tool – creates even further complexity. Despite the lack of evidence to support them, the reporting of contracts in the literature has not tapered off in the last decade or more.

Five general purposes for initiating a contract could be found within the articles of this review: 1) behavior change and skill development including goal development and problem solving; 2) altering beliefs and knowledge including motivation and perceived self-efficacy; 3) improving interpersonal relationships and role clarification; 4) improving the quality and process of chronic care; and 5) altering objective and subjective health indices. There is undoubtedly some overlap amongst these main categories and some information is lost in simplifying the analysis.

A variety of elements were included in individual contracts, including: prescribed and forbidden behaviors, rewards/incentives, consequences, medication/treatment prescriptions, action plans, risks and benefits of treatment, schedules, threats/barriers to success and techniques to overcome them, responsibilities of those signing the contract, instructions, education/rationales, goals/targets, social support for the patient and assessment of health status.

Strengths and Fit with the Broader Literature: The only prior review (Cochrane) on patient contracts for managing chronic medical conditions was limited to randomized controlled trials, with specific goals and a limited population.[3] Evidence for their effectiveness is lacking, with most research failing to consider potential harms.[3] Through a more inclusive and descriptive approach, this study has allowed for more breadth of knowledge around how and why medical contracts are used. Analytical reinterpretation of the extent, range and nature of research activity has identified gaps in the literature and opened up avenues for further inquiry. The consultative process allowed for the methodological and content expertise needed for decisions regarding breadth and comprehensiveness, making the results more useful. Assessment of the appropriateness of contracts and theories used to support them was beyond the scope of this project.

Weaknesses of the Study: The purpose of this scoping review was to describe the scientific literature on patient contracts for managing chronic medical conditions. The grey literature was not considered due to limitations on time and resources for the project. To increase breadth, utilization of an exclusion term approach in the search string allowed for maximal inclusion of articles within the scientific literature. A focus on the word 'contract' in the search string likely resulted in missing literature on equivalent management strategies using different terminology, however a clearer conceptual analysis for the term "contract" and its use in medical literature results. It is possible that interventions labeled as agreements, plans or related terminology may imply or demand alternative theories or processes for implementation, which will only be known through further study.

Implications for Practice and Policy: It is not surprising that most of the literature on contracts comes out of the United States, being a society that values scientific rigor and legal mechanisms for solving problems. On the other hand, the United States also prioritizes patient autonomy and a medical contract that often does not take into consideration patient input and goals goes against this value. Although most contracts are for adults, frequently contracts are targeted towards vulnerable populations, including those with mental illness and substance abuse, minorities, women and children and those financially at risk. Similarly, a contract

that does not take into consideration patient input and goals goes against the process of empowerment that vulnerable populations often require. For these populations in particular, it is likely that an emphasis on skill development and continuity of resources be paramount to sustainability of gains made through an intervention.

Most contracts in the literature occur in the outpatient community setting between a patient and health care provider, with just under 25% occurring in primary care clinics. It is possible that lack of frequent contact and a specialized focus are motivating factors for use of contracts in non-primary care settings.

Implications for Research: The development process for medical contracts, the theory behind them and training for their implementation is rarely discussed in the literature. In many cases, it is difficult to assess the rigor with which they were implemented and the rationale for doing so in the first place. This seems an essential task when attempting to alter such significant processes in populations. It could be argued that such lofty goals require a much longer period for attainment than the literature currently allows. Furthermore, it is possible that a longer intervention period would necessitate opportunities to review the intervention and allow alterations for success; a concept also lacking in the literature. Contract interventions and their effects will need to be assessed in isolation from co-

interventions, with a clear purpose, theory behind their development and relevant outcome measures in order to determine if contracts are capable of accomplishing their intended purposes. Finally, research aiming to provide further conceptual clarity between contracts and related terminology, such as agreements and plans, may provide further insight into which elements of interventions support positive changes for chronic disease management, if they in fact differ.

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Appendix A: Final Database Search Thread

(("contract" or "contracts") not ("contractility" or "contraction" or "contractions" or "contracture" or "contractures" or "contractor" or "contractors" or "muscle" or "muscles" or "muscular" or "bladder" or "bladders" or "uterus" or "uterine" or "legal" or "employer" or "employers" or "employee" or "employees" or "employment" or "outsource" or "outsourcing" or "manufacture" or "manufacturer" or "manufacturing" or "medicaid" or "medicare" or "managed care" or "commissioning" or "commission" or "commissions" or "management contract" or "contract management" or "insurance" or "new contract" or "funding" or "funded" or "social contract" or "social contracts" or "economic" or "economics" or "economy" or "capitation" or "capitated" or "government contract" or "health plan" or "risk contract" or "hospital" or "hospitals" or "surgical" or "contract services" or "contract service" or "services contract" or "service contract" or "services contracts" or "service contracts" or "industry" or "contract research" or "PES contracts" or "PES contract" or "junior contract" or "junior doctor contract" or "contract negotiation" or "contract negotiations" or "consultant contract" or "consultant contracts" or "junior doctor" or "junior doctors" or "cell" or "gene" or "genes" or "genetic" or "genetics" or "animal" or "animals" or "farm" or "farmer" or "farmers" or "farms" or "farming" or "companies" or "company" or "cyto contracts" or "cyto contract" or "supply contract" or "supply contracts" or "purchase contract" or "purchase contracts" or "contracting out" or "contract out" or "school" or "schools" or "classroom" or "classrooms" or "organizational" or "learning contract" or "learning contracts" or "hospice" or "library" or "libraries" or "vendor contract" or "vendor contracts" or "collective agreement" or "collective agreements" or "GP contract" or "copyright" or "dental" or "dentist" or "dentists" or "dentistry" or "criminal" or "parole" or "parolee" or "parolees" or "finance" or "athlete" or "athletes" or "corporate" or "corporation" or "corporations" or "supply chain" or "supply chains" or "welfare" or "international" or "jail" or "jails" or "prison" or "prisons" or "career" or "technology" or "student" or "students" or "worker" or "workers" or "consultant" or "consultants" or "faculty" or "staff" or "market" or "markets" or "preceptor" or "buyer" or "buyers" or "seller" or "sellers")) not animals/

Appendix B: Data Extraction Variables Chart

General Information	
Article Title	
Article Authors	
Journal of Publication	
Year of Publication	
Intervention Country	
Type of Study	
Chronic Condition	
Setting Intervention Initiated In	
Target Population for Intervention	
Parties to the Contract	
Purpose of Intervention	
Contract Development	
Name of Contract	
Development Process of Contract Discussed	Y/N
Patient Input Sought	Y/N
Health Behavior Theory Considered	
Contract Implementation	
Training for Those Initiating Contract Discussed	Y/N
Co-Intervention Involved	Y/N
Follow-Up Duration	
Contract Reviewed Again Following Implementation	Y/N
Contract Composition	
Elements of Contract	
Incentives Used in the Intervention	Y/N
Patient Goals Discussed	Y/N

Appendix C: Data Extraction Chart for Included Studies

	Author	Journal	Year	Country	Type of Study	Chronic Condition	Setting	Population	Parties	Name of Contract	Purpose of Intervention /Contract	How Developed	Training	Co-Intervention	Follow-Up Duration	Contract Reviewed	Patient Input	Elements of Contract	Incentives	Goals Discussed	Health Behaviour Theory
1	Bernstein, E. et al	Academic Emergency Medicine	2009	USA	RCT	marijuana	emergency department	adolescent, smoker	patient, peer educator	contract	alter behavior	unknown	unknown	yes	1 year	yes	yes	unknown	yes	unknown	unknown
2	Blokland, E. et al	Health, Education & Behavior	2009	Holland	longitudinal study	tobacco	school, home	adolescent	patient, guardian	no-smoking agreement	alter behavior, interpersonal (improve communication)	unknown	unknown	no	2 years	unknown	unknown	unknown	unknown	unknown	unknown
3	Bloom, P. et al	Journal of the American Geriatrics Society	2010	USA	pre and post intervention	sedentary	primary care clinic	geriatric	patient, health care provider	physical activity contract	alter behavior, care process (facilitate counseling), alter health indices	previously presented framework	unknown	yes	8 weeks	unknown	yes	activity prescription, instructions, activity suggestions, specific instructions (modifications)	unknown	yes	unknown
4	Born, C. et al	BMC Psychiatry	2015	Germany	retrospective chart review	anorexia nervosa	inpatient unit	AN patients	patient, health care provider	contract	alter health indices, motivation, alter behavior	unknown	unknown	yes	20 weeks	unknown	no	rules of behavior, types of therapy being offered, rewards, restrictions	unknown	unknown	unknown
5	Brinkley, C.J. et al	Evaluation and program planning	2014	USA	pre and post intervention	intellectual and developmental disabilities	community	caregivers	guardian, dental hygienist or principal investigator	behavioral contract	alter beliefs (self-efficacy, alter behavior (support), alter health indices	unknown	unknown	yes	6 weeks	yes	no	unknown	unknown	unknown	social cognitive theory
6	Browne, A. et al	Cambridge Quarterly of Healthcare Ethics	2003	USA	case report	paraplegic	outpatient clinic	31yo male	patient, health care provider	contract	commitment, alter behavior	unknown	unknown	no	8 months	unknown	no	behavior	yes	unknown	unknown
7	Brown, B.L. et al	Journal of acquired immune deficiency syndromes	2011	Malawi	RCT	HIV	outpatient clinic	HIV +, adult	patient, health care provider	contract referral	change behavior	unknown	unknown	yes	2 weeks	unknown	no	unknown	unknown	unknown	unknown
8	Bryan, C.J. et al	Jornal of affective diaorders	2017	USA	RCT	suicidal	emergency department, outpatient clinic	active duty U.S. Army personnel, adult	patient, health care provider	contract for safety, no-suicide contract	alter behavior, alter beliefs	unknown	unknown	yes	6 months	unknown	no	one question: If you were to go home today, do you think you would be able to keep yourself safe?	unknown	unknown	unknown
9	Burkhart, P. et al	Journal of Nursing Scholarship	2007	USA	RCT	asthma	primary care	adolescent	child, guardian, health care provider	contingency contracting	alter behavior, alter health indices	unknown	unknown	yes	16 weeks	unknown	no	unknown	unknown	unknown	social cognitive theory
10	Callan, J. et al	Journal of Psychosocial Nursing & Mental Health Services	2009	USA	case report	borderline personality disorder	inpatient unit	42yo female	patient, guardian, health care provider	contract	alter behavior	unknown	unknown	yes	unknown	unknown	no	acceptable and unacceptable behavior, consequences associated with infractions	unknown	yes	unknown
11	Charlson, M.E. et al	Translational Behavioral Medicine	2014	USA	RCT	coronoary artery disease, asthma, hypertension	primary care clinic	patients, African American, adult	unknown	behavioral contract	alter beliefs (self-efficacy), alter behavior, alter health indices	unknown	unknown	yes	1 year	unknown	yes	what behavior, how often, when, how long	unknown	yes	unknown
12	Chassany, O. et al	Journal of Rheumatology	2006	France	RCT	osteoarthritis	primary care clinic	seniors	patient, health care provider	patient contract, therapeutic contract	alter behavior, alter health indices	unknown	yes	yes	2 weeks	unknown	yes	unknown	unknown	unknown	unknown
13	Chelminski, P.R. et al	BMC Health Services Research	2005	USA	pre and post intervention	chronic non-cancer pain	primary care clinic	adult	patient, health care provider	medication contract, pain contract	alter behavior, alter health indices	unknown	unknown	yes	3 months	unknown	no	prescription conditions	unknown	unknown	unknown
14	Cho, M.K.	Nursing & health sciences	2012	Korea	RCT	renal dialysis	outpatient clinic	adult	patient, health care provider	health contract	alter skills (self-care), alter behavior, alter health indices, interpersonal (nurse)	based on a theory	unknown	yes	4 weeks	yes	yes	goals, methods, expected rewards	unknown	yes	King's goal attainment theory
15	Claydon, B. et al	Ophthalmic and Physiological Optics	1997	UK	RCT	reduced vision (contact lens wearers)	optometrist clinic	adult	patient, health care provider	health care contract	alter behavior, knowledge, alter health indices	unknown	unknown	yes	1 year	unknown	unknown	unknown	unknown	unknown	unknown
16	Cloutier, M. et al	Journal of Pediatrics	2015	USA	RCT	obesity	primary care clinic	children, Hispanic or African American	guardian, health care provider	behavioral contract	alter behavior, alter health indices	unknown	yes	yes	1 year	yes	yes	action plan	unknown	yes	unknown
17	Crealey, G. et al	Pharmacoeconomics	1998	UK	RCT	tobacco	pharmacy	adult	patient, health care provider	contract	care process (cost-effectiveness), alter behavior, alter beliefs/knowledge	unknown	unknown	yes	2 years	unknown	yes	benefits, risks, stop date	unknown	unknown	unknown
18	Cruz, J. et al	European Respiratory Journal	2016	Portugal	RCT	chronic obstructive pulmonary disease	primary care clinic, outpatient clinic	adult	patient, health care provider	health contract	alter behavior, alter health indices	unknown	unknown	yes	6 months	yes	yes	behavior (long-term goal)	unknown	yes	social cognitive theory
19	Dallery, J. et al	Journal of applied behavior analysis	2008	USA	RCT	tobacco	home	adult	patient, health care provider	deposit contract	alter behavior, alter health indices	unknown	unknown	yes	24 days	unknown	no	unknown	yes	unknown	unknown

20	DeMarce, J.M. et al	Addictive Beaviors	2008	USA	RCT	substance abuse and psychiatric disorders	primary care clinic	adult	patient, health care provider	behavioral continuing care contract	alter behavior	unknown	unknown	yes	1 year	unknown	unknown	abstinence rates	unknown	unknown	unknown
21	Desai P.M. et al	American Journal of Health Behavior	2014	USA	RCT	osteoarthritis	community	geriatric	patient, health care provider	negotiated follow-up contract	alter behavior, alter beliefs (stage of change)	unknown	unknown	yes	18 months	yes	yes	preferences, capability, opportunities, strategies for handling relapse, barriers, plan/requirements	unknown	yes	unknown
22	Feeney, G. et al	Australian and New Zealand Journal of Psychiatry	2002	Australia	non-randomized historical cohort comparison	alcohol	outpatient clinic	adult	patient, health care provider	contract	alter behavior	Unknown	unknown	yes	12 weeks	unknown	unknown	Unknown	unknown	unknown	social cognitive theory
23	Feeney, G. et al	Australian and New Zealand Journal of Psychiatry	2001	Australia	non-randomized historical cohort comparison	alcohol	outpatient clinic	adult	patient, health care provider	contract	alter behavior	unknown	unknown	yes	1 year	unknown	unknown	unknown	unknown	unknown	unknown
24	Fishman, M.S. et al	Journal of pain and symptom management	2002	USA	retrospective chart review	chronic non-cancer pain	outpatient clinic	adult	patient, health care provider	trilateral opioid contract	care process (improve collaboration), alter behavior	unknown	unknown	no	10 months	unknown	no	requirements for opioid usage, commitment, agreement on prescription	unknown	unknown	unknown
25	Fleming, F.M. et al	The journal of family practice	1999	USA	RCT	alcohol	primary care clinic	adult	patient, health care provider	contract	alter behavior, alter care process (reduced acute care resource use)	unknown	unknown	yes	1 year	unknown	unknown	unknown	unknown	unknown	unknown
26	Foelsh, P.A. et al	Psychotherapy in practice	1998	USA	case report	borderline personality disorder	outpatient clinic	43 years old female	patient, health care provider	treatment contract	alter behavior	unknown	unknown	no	1 year	unknown	yes	therapy arrangements, behavior for client that could interfere with therapy, client limits and expectations, therapist resposibilities	unknown	yes	Kernberg's theory for transference-focused psychotherapy (unsure if specific to contract)
27	Gallucci, G. et al	The Academy of Psychosomatic Medicine	2001	USA	case report	hepatitis C, psychiatric disorders, substance abuse	outpatient clinic	38yo female	patient, health care provider	treatment contract	alter behavior, allow monitoring	unknown	unknown	no	3 months	unknown	unknown	rationale, patient's commitment to compliance, treatment regimen, abstinence	unknown	unknown	unknown
28	Gonda-Kotani, C. et al	Journal of Prevention and Intervention in the Community	2017	USA	ecological momentary study	physical disabilities	community	adult	patient, health care provider	contingency contract	alter behavior	unknown	unnown	yes	3 months	unknow	no	rewards for adhering to self-monitoring	yes	unknown	unknown
29	Haber, D. et al	The Gerontologist	2004	USA	post intervention study (completion rates)	sedentary	community	geriatric	patient, health care provider	health contract calendar	alter behavior, alter beliefs (motivation, self-efficacy)	unknown	yes	yes	2.5 months	yes	yes	motivation (information), goal setting, social support, memory techniques, problem solving, specific exercise goals	unknown	yes	social cognitive theory
30	Hariharan, J. et al	Journal of General Internal Medicine	2007	USA	retrospective chart review	chronic non-cancer pain	outpatient clinic	adult	patient, health care provider	medication contract (agreement), provider-patient agreement, opioid contract	alter behavior	unknown	yes	yes	unknown	unknown	no	patient and physician responsibilities, diagnosis, prescription, conditions under which/not prescribed, drug screens	unknown	unknown	unknown
31	Hartmann, A. et al	Psychotherapy Research	2007	Germany	longitudinal study	anorexia nervosa	inpatient unit	adult	patient, health care provider	treatment contract	alter behavior, alter health indices	unknown	unknown	yes	unknown	unknown	no	rate of weight gain, target weight, unclear if more included	unknown	unknown	unknown
32	Heneman, K. et al	Journal of the American Dietetic Association	2005	USA	RCT	nutrition	community	poverty, female, adult	patient, health care provider	contract for change tool	alter behavior, alter beliefs (readiness for change, self-efficacy)	adapted from previous work, tested in focus groups	yes	yes	10 months	unknown	yes	goals, methods for achieving them	unknown	yes	behaviour modification model
33	Hillman, H. et al	The Behavior Analyst Today	2009	USA	ABAC reversal design	asthma	home	30yo female	patient, health care provider	contingency contract	alter behavior	unknown	yes	yes	9 months	unknown	no	prescription conditions	yes	unknown	unknown
34	Hovell, M. et al	Nicotine & Tobacco Research	2009	USA	RCT	tobacco	community	mothers	patient, health care provider	behavioral contracting	alter behavior	unknown	unknown	yes	18 months	yes	yes	short and long term goals for reducing exposure	yes	yes	behavioral-ecological model

35	Hovell, M. et al	American Journal of Public Health	2003	USA	RCT	latent tuberculosis infection	community	Latino, adolescents	patient, peer counsellor	contingency contracting	alter behavior	unknown	unknown	yes	6-9 months	unknown	no	unknown	unknown	yes	behavioural-ecological model
36	Hughes, S. et al	American Journal of health Behaviour	2010	USA	RCT	osteoarthritis	community	geriatric	patient, health care provider	physical activity maintenance contract	alter behavior, alter health indices	unknown	unknown	yes	18 months	unknown	yes	exercise prescription	unknown	yes	social cognitive theory
37	Ijff, M. et al	BMC Health Services Research	2007	The Netherlands	RCT	depression	primary care clinic	adult	patient, health care provider	contract; treatment plan	alter behavior/skills, care process (cost-effectiveness), alter health indices	used from another study	yes	yes	18 weeks	yes	yes	preferred treatment, alarmng symptoms, maintenance of meds, stepped care	unknown	yes	unknown
38	Jaffee, W. et al	Harvard Review of Psychiatry	2009	USA	case report	post-traumatic stress disorder, dissociation, substance dependence	community	15yo male	patient and health care provider; patient, guardian and health care provider	behavioral contract	alter behavior	unknown	unknown	yes	unknown	yes	no	treatment, random screens, targets, positive reinforcers, negative consequences, responsibilities (patient, therapist, parents)	yes	unknown	unknown
39	John, L. et al	Journal of General Internal Medicine	2011	USA	RCT	obesity	primary care clinic	Veterans, adults	unknown	deposit contract	alter behavior, alter health indices	unknown	unknown	yes	32-36 weeks	yes	yes	unknown	yes	yes	behavioral economics
40	Kanahara, S.	International Journal of Behavioral and Consultative Medicine	2010	USA	case report	schizophrenia	community	adult male, immigrant	patient, guardian, health care provider	behavior contract	alter beliefs (commitment), alter behavior, alter health indices, interpersonal (commnication with family), care process (making it concrete)	from behavioral assessment	unknown	yes	unknown	unknown	no	treatment goals and expectations, target behaviors, rationales, patient and parent responsibilities	unknown	unknown	unknown
41	Kegler, M. et al	American Journal of Public Health	2016	USA	RCT	overweight/obesity	community	adult, female	patient, peer coach	behavioral contract, family contract	alter behavior	healthy actions from a pilot study, refined by community advisory board members	unknown	yes	1 year	unknown	yes	6 healthy actions	unknown	yes	social cognitive thory
42	Kirschenbaum, D. et al	Obesity Research	2005	USA	longitudinal study	obesity	community	adolescent, low-income	patient, guardian, health care provider	behavioral contract	alter behavior, alter health indices	unknown	unknown	yes	3 months	unknown	no	parents and participants commitment to self-monitor diet and exercise	unknown	unknown	unknown
43	Knight, J. et al	Journal of Psychiatric Practice	2007	USA	retrospective chart review	mental and behavioral health problems including depression, bipolar, disruptive; also substance use	community	physician, adult	patient, health care provider	mental and behavioral health or substance use disorders contract; monitoring contracts	alter behavior/skills	unknown	unknown	yes	2-5 years	yes	no	elements of treatment, self-reports, collateral reports, specified tx plan, medication if indicated	unknown	unknown	unknown
44	Kominski, G. et al	Journal of Adolescent Health	2007	USA	RCT	latent tuberculosis infection	public health clinic	adolescent	patient, guardian	contingency contracting	alter behavior, care process (cost-effectiveness)	unknown	unknown	yes	6 months	unknown	yes	tanglibles and priveleges for adolescent if compliant	yes	yes	unknown
45	Kraft, D.	Contemporary Hypnosis and Integrative Therapy	2012	UK?	case report	tobacco	community	33yo male	patient, health care provider	verbal contract	alter behavior	unknown	unknown	yes	1 year	unknown	no	verbal agreement to give up smoking	unknown	unknown	unknown
46	Labhardt, N. et al	Tropical Medicine and International Health	2011	Cameroon	RCT	hypertension and diabetes	primary care clinic	adult	patient, health care provider	treatment contract	alter behavior, alter health indices	unknown	yes	yes	1 year	unknown	no	process of therapy, commitment, nurse responsibilities	yes	unknown	unknown
47	Lash, S. et al	Psychology of addictive behaviors	2007	USA	RCT	substance use	outpatient clinic	adult, Veteran	patient, health care provider	aftercare contract, behavioral contract	alter behavior	unknown	unknown	yes	1 year	yes	no	abstinence rates, commitment, exceptions, rewards, plans	yes	unknown	unknown
48	Lash, S. et al	American Journal of Drug and Alcohol Abuse	1998	USA	RCT	substance abuse	outpatient clinic	adult, Veteran	patient, health care provider	aftercare participation contract	alter behavior	unknown	unknown	yes	8 weeks	unknown	yes	info on relapse rates, commit to a group, alternative plans optional	unknown	unknown	unknown
49	Lash, S. et al	Journal of Substance Abuse Treatment	2013	USA	RCT	substance use	outpatient clinic	adult, Veteran	patient, health care provider	behavioral contract	alter behavior, alter beliefs (motivation)	informed from prior studies	unknown	yes	1 year	yes	yes	as above but also to obtain a sponsor and when to contact, incentives	yes	unknown	unknown

50	Lemstra, M. et al	Patient Preference and Adherence	2015	CAN	pre and post intervention	obesity	community	adult	patient, peers	social support contract	alter behavior, alter health indices	components recommended by a guideline	unknown	yes	24 weeks	unknown	yes	goals, barriers, solutions, how friends can help	unknown	yes	unknown
51	Lievers, L.	European Child and Adolescent Psychiatry	2009	FRANCE	retrospective chart review	anorexia nervosa	inpatient unit	adolescent, female	patient, guardian, health care provider	therapeutic contract, weight contract	care process (length of stay), alter behavior	unknown	unknown	yes	unknown	unknown	yes	separation period, target discharge weight, end of separation weight	yes	yes	unknown
52	Lundervold, D. et al	International Journal of Behavioral Consultation and Therapy	2008	not stated (NS)- but guessing US since that's where authors are from	pre and post intervention	fibromyalgia	unknown	44yo female	patient, health care provider	behavioural contract	alter behavior/skills, alter health indices	unknown	unknown	yes	6 months	unknown	no	commitment to practice skills, fill out a chronic daily pain record, mail weekly self recorded data	unknown	unknown	unknown
53	Magneberg, R.	Addictive Behaviors	1998	Sweden	case report	alcohol	community	Adult	patient, health care provider	moral contract	alter behavior	unknown	unknown	yes	1 year	unknown	no	commitment to carry out the project by a handshake	unknown	unknown	unknown
54	Mancuso C.A. et al	Archives of Internal Medicine	2012	USA	RCT	asthma	primary care clinic	Adult	patient, health care provider	contract	alter behavior	unknown	unknown	yes	1 year	yes	yes	commitment to prescribed activity	unknown	unknown	unknown
55	Mancuso C.A. et al	Annals of Allergy, Asthma and Immunology	2010	USA	RCT	asthma	primary care clinic	Adult	patient, health care provider	contract	alter behavior, alter health indices	workbook	unknown	yes	2 years	unknown	yes	commitment to activity to improve asthma	unknown	unknown	unknown
56	MartinezTaboas, A. et al	Dissociation: Progress in the Dissociative Disorders	1997	Puerto rico	case report	dissociative identity disorder (DID)	community	28yo female	patient, health care provider	contract	alter behavior	unknown	unknown	yes	1 year	unknown	no	commitment to not hurt body, therapist responsibilities	unknown	unknown	unknown
57	Masson, S. et al	Transplant International	2014	UK	non-randomized historical cohort comparison	alcoholic liver disease (ALD)	outpatient clinic	adult	patient, health care provider	alcohol contract	alter behavior, alter health indices	unknown	unknown	yes	unknown	unknown	no	commitment by alters to not hurt other	unknown	unknown	unknown
58	Mishara, B. et al	American Journal of Community Psychology	1997	Canada	retrospective observational study	suicidal	call center	Unknown	patient, health care provider	contract	alter behavior, alter health indices	unknown	yes	yes	unknown	unknown	no	commitment to not commit suicide and to follow-up	unknown	unknown	unknown
59	Moljord, I.E.O. et al	Patient education and counseling	2017	Norway	RCT	psychiatric disorders	community	adult	patient, health care provider	self-referral to inpatient treatment contract	alter behavior, alter beliefs (confidence), support rights to self-determination, promote user participation in decision-making in own treatment	unknown	unknown	yes	1 year	unknown	unknown	unknown	unknown	unknown	unknown
60	O'Farrell, T.J. et al	Journal of studies on alcohol	1998	NS but I'm guessing the U.S b/c that's where the authors are from	RCT	alcohol	primary care clinic	married, male, adult	unknown	antabuse contract	alter behavior, interpersonal (marriage)	unknown	unknown	yes	30 months	unknown	no	patient and spouse responsibilities	unknown	unknown	unknown
61	Ogedegbe, G.O. et al	Archives of Internal Medicine	2012	USA	RCT	hypertension	primary care clinic	African American, adult	patient, health care provider	behavioural contract	alter beliefs (commitment), alter behavior, alter health indices	unknown	unknown	yes	1 year	unknown	no	commitment to take meds as prescribed	unknown	unknown	unknown
62	Ostfeld, R.J. et al	International journal of cardiology	2007	NS but I'm guessing the U.S b/c that's where the authors are from	non-randomized historical cohort comparison	cardiovascular disease	outpatient clinic	adult	patient, health care provider	weight loss contract	alter behavior, alter health indices	unknown	unknown	yes	unknown	unknown	no	commitment to rate of weight loss	unknown	unknown	unknown
63	Peterson, J.C. et al	Archives of Internal Medicine	2012	USA	RCT	coronary artery disease	outpatient clinic	adult	patient, health care provider	behavioural contract	alter behavior, alter health indices	unknown	unknown	yes	1 year	unknown	yes	commitment to self-selected physical activity	unknown	unknown	unknown
64	Piotrowski, N.A. et al	Experimental and clinical psychopharmacology	1999	USA	RCT	opioid	primary care clinic	adult	patient, health care provider	contingency contract	alter behavior, alter health indices, interpersonal (family)	unknown	unknown	yes	unknown	unknown	no	commitment to abstinence	yes	unknown	unknown
65	Resnicow, K. et al	Preventive medicine	1997	USA	RCT	tobacco	community	African Americans, adult	patient	quit contract	alter behavior	unknown	unknown	yes	6 month	unknown	yes	patient-selected quit date	yes	yes	unknown
66	Sagawa, M. et al	International journal of nursing studies	2003	Japan	pre and post intervention	chronic haemodialysis (HD)	outpatient clinic	adult	patient, health care provider	self-contracting	alter behavior, care process (clarify objectives), alter beliefs (commitment)	unknown	unknown	yes	4 weeks	unknown	yes	specific behaviours, commitment to plan, fluid intake objectives, reinforcers when successful	yes	yes	unknown

67	Schlenk, E.A. et al	Applied Nursing Research : ANR	1998	USA	RCT	diabetes	outpatient clinic	adult	patient, health care provider	contingency contract	alter behavior, alter health indices	behavioral model	yes	yes	unknown	unknown	yes	behavior to be performed	yes	yes	social cognitive theory
68	Shaw, S.E. et al	Journal of Rehabilitation Research and Development	2005	USA	pre and post intervention	traumatic brain injury (TBI)	outpatient clinic	adult	patient, health care provider	behavioral contract	alter behavior, alter health indices	unknown	unknown	yes	2 years	unknown	yes	activities the participant should perform, activities for which the mitt could be removed	unknown	unknown	unknown
69	Sherman, J.M. et al	Clinical pediatrics	2001	USA	pre and post intervention	asthma	outpatient clinic	children	patient, guardian, health care provider	behavioral contract	alter behavior, care process (use of acute resources)	unknown	unknown	yes	1 year	unknown	no	acknowledgment of poor control and adherence, prescription, guardian and patient behaviors, action plan, responsibilities of treating team, consequences	unknown	unknown	unknown
70	Sibley, M.H. et al	Journal of consulting and clinical psychology	2016	USA	RCT	attention deficit hyperactivity disorder	school	adolescent	patient, guardian, health care provider	parent-teen contract	alter behavior	unknown	yes	yes	6 months	unknown	yes	monitoring plan	unknown	unknown	unknown
71	Stanger, C. et al	Drug and Alcohol Dependence	2009	USA	RCT	marijuana	outpatient clinic	adolescent	patient, guardian	substance monitoring contract	alter behavior, interpersonal (parenting), alter health indices	unknown	unknown	yes	9 months	yes	yes	positive and negative consequences	yes	unknown	unknown
72	van der Voort, T. et al	The British Journal of Psychiatry	2015	The Netherlands	RCT	bipolar disorder	outpatient clinic	adult	patient, health care provider	contracting	alter behavior, alter health indices	unknown	unknown	yes	1 year	unknown	yes	most important problems, treatment activities, treatment plan, goals	unknown	yes	unknown
73	Vinson, D. et al	Substance Abuse	2000	USA	RCT	alcohol	primary care clinic	adult	patient, peer, health care provider	behavioral contract	alter behavior, alter health indices	previous research	unknown	yes	1 year	unknown	yes	chosen behaviors	unknown	yes	unknown
74	Washington, W. et al	Translational issues in psychological science	2016	USA	RCT	sedentary	community	adult	patient, health care provider	deposit contract	alter behavior	unknown	unknown	no	21 days	unknown	no	unknown	yes	yes	unknown
75	White, J. et al	American Journal of Preventative Medicine	2013	Thailand	RCT	tobacco	community	adult	patient, health care provider	commitment contract	alter behavior, care process (cost)	unknown	unknown	yes	14 months	unknown	no	unknown	yes	unkown	behavioral economics, peer pressure
76	Young, R. et al	Journal of Substance Abuse Treatment	2011	Australia	pre and post intervention	alcohol	outpatient clinic	adult	patient, health care provider	contract	alter beliefs (expectancy, self-efficacy), alter behavior	unknown	unknown	yes	12 weeks	unknown	no	committing to abstinence for duration of program	unknown	unknown	unknown