Self-management among community-dwelling people with chronic conditions: adapting evidence-based group programs using intervention mapping

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ABSTRACT

Objective. Self-management is a core theme within chronic care and several evidence-based interventions (EBIs) exist to promote self-management ability. However, these interventions cannot be adapted in a mere copy-paste manner. The current study describes and demonstrates a planned approach in adapting EBI's in order to promote self-management in community-dwelling people with chronic conditions.

Methods. We used Intervention Mapping (IM) to increase the intervention's fit with a new context. IM helps researchers to take decisions about whether and what to adapt, while maintaining the working ingredients of existing EBI's.

Results. We present a case study in which we used IM to adapt EBI's to the Flemish primary care context to promote self-management in people with one or more chronic disease. We present the reader with a contextual analysis, intervention aims, and content, sequence and scope of the resulting intervention.

Conclusion. IM provides an excellent framework in providing detailed guidance on intervention adaption to a new context, while preserving the essential working ingredients of EBI's.

Practice Implications. The case study is exemplary for public health researchers and practitioners as a planned approach to seek and find EBI's, and to make adaptations.

1. Introduction

One of the major challenges in contemporary clinic is the treatment of chronic non-communicable diseases (NCD's), such as cardiovascular and respiratory diseases, cancer, or diabetes. The rapid increase in NCD's is also visible in Belgium. The number of citizens with diabetes for instance increased by 145% between 2000 and 2013 [1]. Chronic diseases are difficult to treat, and tend to persist over time [2]. A chronic care model that takes into account the perspective of the patient should become the prevailing model of care [3,4]. A well-known example is the Chronic Care Model of Wagner [5,6], which is now used as a guide to implement integrated, person-centered care in different health settings throughout Europe [7,8].

The promotion of self-management is one of the cornerstones of person-centered care. Self-management entails that patients actively engage in their daily disease management [9]; It consists of three important tasks: managing the therapeutic regimen (i.e., correctly taking medications, attending medical appointments, adopting a healthier lifestyle), managing emotions associated with having a chronic disease, and managing (new) life roles [10]. This requires skills such as: to identify needs and set up an action plan, to recognize and solve problems when executing these action plan(s), and to communicate effectively with health care providers and informal contacts about their self-management needs and strategies [9,11]. It may also consist of knowing how to navigate in the complex health care system, maintain self-worth, sustain spiritual self, and personal growth [12]. Self-management tasks are hence diverse and may differ between individuals. This makes self-management promotion a complex endeavor.

Several attempts have been undertaken in designing effective self-management support interventions. Perhaps the most widely used intervention to date is the Chronic Disease Self-Management Program of Stanford University (CDSMP), developed by Kate Lorig and colleagues in the early 1990s. The CDSMP is an example of a group-based community self-management program mainly led by lay leaders aiming at helping participants to develop a range of self-management skills as well as the confidence to better manage their own disease [13]. The program has shown to have proven impact on symptom relief, self-efficacy, actual self-management behavior and health status, and reduced hospitalization and emergency visits have also been reported [13]. However, studies outside a US setting failed to

replicate these findings. One Dutch study enrolling 159 people aged 59 years and older in the CDSMP program, for instance, did not find a significant effect on patients' self-management behavior or health status [14]. Lack of effectiveness might relate to methodological issues such as characteristics of the sample, study attrition or differences in outcome measurements. Another possible explanation might relate to cultural sensitivity. An evidence-based program cannot be copied as such, but must be adapted to cultural needs and preferences, while maintaining the essential elements that make the program work [15,16,17]. Unfortunately, studies on program adaptation rarely report on the process of adaptation, and which features of a program constitute the "essential elements". In this paper, we describe how we adapted evidence-based interventions (EBI's) for community-dwelling adult patients with chronic conditions in Flanders, Belgium with the aim of promoting self-management.

2. Methods

2.1. Adapted Intervention Mapping approach

For this study, we were informed by modified versions of Intervention Mapping (IM) that guide the steps and tasks for adapting EBI's to a new context instead of developing a new intervention [18, 19]. A stepwise approach is proposed consisting of six steps: 1) search for EBI's and judge fit according to the characteristics of the target group, 2) adapting program goals, 3) adapting methods and strategies for behavior change, 4) design of the intervention plan, 5) plan for implementation, and 6) plan for evaluation. The current study focuses on steps 1-4.

2.2. Step 1: Search of EBIs and judge fit

In this first step, we aimed to search for EBI's and judge their fit, i.e. consider whether the focus of EBI's match the health problem, behaviors, and needs and characteristics of our target population. Both a literature search and a subsequent qualitative assessment among target group members were performed.

2.2.1. Literature search

Web of Science, PubMed, LIRIAS, and Google Scholar databases were searched for publications since the start of the journal databases until end of December 2015, with the keywords: ‘self management’, (‘group’ OR ‘group program’ OR ‘program’), and (‘chronic disease’ OR ‘chronic illness’ OR ‘chronically ill’). We searched for studies that mentioned the development and/or evaluation of a self-management group program, which was consequently assessed for inclusion according to a number of criteria. We included a program if 1) it was described to be mainly a group program, either or not complemented with individual guidance; 2) it targeted people with mainly somatic chronic conditions; and 3) it aimed to promote self-management in the target population. We excluded a program if it targeted people with a major mental or psychiatric disorder.

2.2.2. Qualitative assessment

Semi-structured interviews and focus groups were carried out with chronically ill people as well as health care providers to obtain feedback and suggestions on essential elements for a self-management program related to aims and content, scope, sequence and planning, and methods and materials. Chronically ill people were recruited from self-help support organizations. After general information was given, interested participants were personally asked to participate in the study by the researcher by telephone. Purposive sampling was used and we aimed to include individuals with maximum variation according to age and common disease/complaints. In addition, individuals were chosen on the basis of their ability to identify common issues/needs, irrespective of own specific clinical/diagnostic issues. Health care providers were contacted through different professional associations. Upon interest, they were contacted personally by telephone, and invited to take part in a group discussion. With those who could not attend the group discussion, individual interviews were held. Purposive sampling was used and we aimed to include providers with maximum variation in professional background and years of experience.

Two focus groups with chronically ill people with a diversity of common chronic diseases/complaints (diabetes mellitus, chronic pain disorder, chronic kidney disease, Parkinson, heart disease) were held (total n = 9). Four of the 9 patients

suffered from more than one chronic disease. One focus group and two semi-structured interviews with health care providers (general practitioners, nutritionists, physiotherapists, nurses, pharmacists; n = 11) were held. All focus groups were held within a community health center that was easily accessible and perceived of as a neutral interviewing place for participants. Individual interviews were held in the research center of the University College. Focus groups and semi-structured interviews covered the following topics: themes, methods and strategies within a self-management group program, duration of a program and timing of the sessions, target population of the program, practical issues concerning finance, accommodation, and transport, and factors that might influence decisions about participation. Focus groups and interviews lasted between 60-90 minutes. All were digitally recorded, transcribed verbatim, and coded. Data were reviewed by two raters independently (EL, LL) and afterwards compared leading to the final definition and conclusion of topics. All participants provided written informed consent, and the University Hospital Leuven provided ethical approval for the study (number = B322201629326).

2.3. Step 2: Adapting program goals

Step two of IM determines the goals for the program specifying what the target population has to change or do as a result of the program.

The main aim of our program was to promote self-management behavior among a target group of people with various chronic diseases. We first subdivided this general aim into specific program goals or sub-steps. In defining our program goals, we were informed by the program goals of the candidate EBIs. Next, we decided on the behavioral determinants needed to move towards these goals, i.e. reasons behind behavior. We built on and combined behavioral determinants of three well-established theories of behavior change, including the Health Belief model (HBM) [20], the Theory of Planned Behavior (TPB) [21], and the Social Cognitive Theory (SCT) [22]. The central aspect of the HBM is that behavior change will more likely occur when people are aware of the threat of a health risk, and if they feel they are personally susceptible (knowledge/awareness). According to the TPB, behavior is determined by the individual's intention to engage in it. This intention is influenced by the extent to which one values the behavior (attitude), the ease with which it can be performed (behavioral control), and the perceived views of significant others

(subjective norm). The element of behavioral control is much more advanced within the SCT. SCT is built around the concept of self-efficacy, referring to one's confidence in overcoming barriers to perform a certain behavior (self-efficacy/skills).

2.4. Step 3: Adapting methods and applications for behavior change

The objective of step 3 is to link the program goals to effective methods, and to translate these into practical applications. Methods are theory-based ideas of how change in behavioral determinants can be achieved. Applications are practical translations of a method [23,24]. The two candidate EBIs served as inspiration to collect preliminary ideas for methods. We synthesized these initial ideas using taxonomy of effective behavior change methods as described within the IM approach [23,24]. This taxonomy summarizes the evidence for a method regarding effective behavior change based on several behavioral and/or social science theories. Next to a description of methods, this taxonomy also describes the parameters that have to be met in order for methods to be effective for behavior change within specific populations and contexts. These parameters help to translate the theory-based methods to practical applications in order to reach optimal fit. Behavior change methods and applications were discussed among the research team, until consensus was reached.

2.5. Step 4: Design of the intervention plan

Step four consists of the combination of the different components of the intervention, and the creation of a stepped plan and materials.

Detailed protocols of the two candidate EBIs were used as primary sources of intervention design. The project team adapted content and materials to the needs of the target group, and produced a detailed manual for the intervention. As a next step, the manual and materials were pre-tested by two representatives of the target population, who themselves were experience in patient support and coaching. Following iterative thinking aloud sessions, changes in manual and materials were made to make it as relevant and achievable as possible to the target population of chronically ill people.

3. Results

3.1. Step 1: Search of EBI's and judge fit

3.1.1. Literature search

Our search identified 30 self-management support programs, of which 24 were disease-specific and 6 were more generic (i.e., targeting a population having different chronic diseases). Table 1 provides an overview and descriptives related to their theory-base, target population, and delivery mode. The research group identified the six generic EBIs as relevant for the scope of our project. These included: the Chronic Disease Self-Management Program [13], the Expert Patients Program (EPP) [25], the Short self-management intervention for patients with chronic disease [26], the Moving On Programme [27], the Self-Management Program for workers with a chronic disease [28], and the Self-Management Program for patients with a long-term condition [29]. We also noticed that the Patient Education Program (PEP), although initially developed for patients with Parkinson's disease [30], was also assessed as being applicable to a wider range of chronic diseases [31]. We therefore included this program in our analysis as well. We assessed basic fit: Did the program target self-management promotion in the community? Is the program suitable to being led within the community? Are there reported data on program acceptability by the target group? Is there a theoretical model underlying the program? [18,19] Two researchers with expertise in self-management and chronic disease care (LL, EL) assessed fit independently, and discussed findings until consensus was reached. Two candidate EBI's were chosen. The first EBI was the original CDSMP [13], one of the most frequently used programs and a set example of many of the generic programs on our list. The second EBI was the Patient Education program (PEP) [30]. While most of the generic self-management programs are targeted at individuals with chronic somatic diseases, the generic version of the PEP argues to be applicable for individuals with chronic psychological conditions as well [31]. This is valuable, certainly in light of the trend towards integrated care and the interdependence between physical and mental health [32]. In order to assess detailed fit and to plan adaptations, the research team obtained published program manuals of the two candidate EBIs. From these manuals, the research team considered essential elements for the self-management program related to aims and content, scope,

sequence and planning, and methods and materials. An interview guide and focus group topic list were developed around these essential elements and used as a tool within the subsequent qualitative assessment phase.

3.1.2. Qualitative Assessment

Regarding program content, patient interviewees indicated the most important themes to be self-acceptance, communication with family and health care providers, practical/administrative help and support to self-manage one's disease, and administrative support to deal with the consequences of the illness. In addition, health care providers stressed the mere importance of increasing self-management and empowerment of the patient. At the same time, most health care providers could not let go the need for delivering disease-specific information and instructions, a goal that is not easily tackled within a generic self-management group program. Patient interviewees, on the other hand, mainly stressed the importance of generic methods such as increasing self-efficacy, goal setting and commitment. Further on, according to all interviewees, a self-management group program should be appealing to all group members, easy to comprehend and attend, and should include humor or other positive motivational elements or incentives. Further on, interviewees agreed on a set of maximum six 2-hour sessions, and follow-up afterwards.

Overall, the findings from our qualitative assessment were roughly congruent with the scope and themes from the two candidate EBIs, but some differences appeared. While the CDSMP also focuses on disease-related factors such as coping with symptoms (e.g., pain, fatigue) of the disease, or the evaluation of current treatment regimens, our target group of chronically ill individuals did not mention these as core themes to be tackled in a self-management program. We learned that people rather prefer a generic content that is applicable irrespective of one's underlying chronic disease, such as self-monitoring, goal setting, and communication about their needs and goals with family and health care providers. This matches some of the themes of the CDSMP, and the themes from the PEP. Further on, interviewees believed that change required change methods beyond information, such as problem solving, discussions, and action planning, described within the CDSMP and PEP. Lastly, needs with regard to sequence and planning were in line with those from the two candidate EBIs.

3.2. Step 2: Resulting program goals

Our programs goals consisted of actions such as problem identification, goal setting, action planning, and social/peer support seeking. Behavioral determinants included: *knowledge/awareness* on the health risks of poor self-management behavior, a positive *attitude* towards self-managing one's disease, perceived competence (*self-efficacy*) that one can self-manage one's disease, perception that one's environment supports self-management (*subjective norm*), and *skills* to overcome barriers in self-managing one's disease (see Table 2).

3.3. Step 3: Methods and applications

Knowledge of the problem and awareness that change is required are necessary prerequisites to change behavior and may be promoted through providing information about the problem or confrontation about the causes, consequences, or alternatives for a problem, visual aids and guided learning [23,24]. In addition, we found most self-management interventions to incorporate methods suggested by the Social Cognitive Theory of Bandura [22] to enhance self-efficacy capacity and skills. These include:

- Self-monitoring, goal setting, action planning and feedback: giving information and tools to individuals in order to improve the extent to which they accomplish new behavior
- Modeling of behaviors: providing an appropriate model that is being reinforced to the desired action
- Problem-solving: prompting individuals to list possible barriers and ways to overcome these
- Discussion and elaboration: changing the way individuals think about the problems and ways to overcome it
- Participation, direct experience and active learning: assuring engagement and decision-making and ensuring learning from own experiences

The next step was to translate these methods into practical applications. Table 2 describes the methods and applications used in our final self-management program.

In the next section (design of the intervention plan), we describe those methods and applications in more detail within the course of the program.

3.4. Step 4: Design of the intervention plan

Our program consisted of five consecutive sessions of each two hours with a 3-week interval in between, and one follow-up session of the same duration one month after the fifth session. An overview of the content of each of the sessions is given in Table 3.

During the first session, we aimed to use methods and strategies to influence knowledge/awareness regarding the importance of self-management one's disease. Through short information moments, open debates, and exercises during the course of the sessions, participants are encouraged to raise consciousness on personal advantages, and/or obstacles of self-management and their level of self-management so far. Participants are encouraged to identify possible domains that require action and that might help to improve their level of self-management (e.g., medication adherence, physical activity, communication, etc.). Schemes and visual material are used in order to increase comprehensibility.

As the group program advances, we use methods that serve to influence attitude, self-efficacy, and subjective norms. The attitude is influenced through direct experience, self-reevaluation, and elaboration through in-session exercises, elaborated homework activities, and by embedding stories of lay leaders in order to make content more relevant and concrete. Subjective norms are influenced by means of modeling and mobilizing for social support through lay leader involvement (i.e., a peer leading parts of the sessions, and talking about how he/she experiences the themes and resolves problems), and by encouraging participants to talk about the course and action plans with family, friends, and health care providers. Self-efficacy is promoted by means of goal setting, action planning and problem solving. During session two, for example, participants are asked to formulate a personal goal that would lead them to increase their level of self-management (e.g., exercise, ask for help from family members). During the next sessions, participants are then required to report whether or not they strived for their goal, and whenever problems arise, participants are supported to give solutions (action planning, planning coping responses). On regular occasions, activities and discussions are built in to reflect

upon the goals that they set at the beginning of the program. At the end of the program, we focus on overcoming barriers, and planning. The sixth session is a follow-up and crucial in this respect, and participants are encouraged to discuss their earlier goals and action plans, as well as to formulate solutions whenever obstacles in attaining their goals arise.

The program is designed to be provided by a duo of a trained professional and a lay leader. In accordance with the CDSM, we would advise leaders/facilitators to undergo training on self-management support and coaching before program set-up.

4. Discussion and conclusion

4.1. Discussion

Our main goal was to describe the adaptation of a community self-management group program for chronically ill people using a step-wise approach. Adapted IM approaches [18, 19] provide useful descriptions of how to systematically adapt EBIs to another context. From our initial literature search, a list of EBIs appeared available that diverge on a number of elements, such as target population, theoretical model/assumptions, and delivery modes. We chose the CDSMP [13] and the PEP program [30] as candidate EBIs to inform the development of a self-management group program within the Flemish primary care setting. These EBI's contain generic mechanisms of actions leading to increased self-management ability and, thus, prove viable options to be implemented in often multimorbid chronic disease populations that can be reached within a primary care context. These mechanisms of actions relate to theory, and most often, theoretical assumptions of the SCT of Bandura [22]. The explicit use of theory is essential, as it contains the actual working elements of an intervention. Also, while most EBI's appear to be theoretically based, detailed reporting on the process of translating the assumptions into actual intervention elements is lacking. We hope by describing the development process and content of an intervention, we will further research in the field. By detailed reporting of the intervention elements, mechanisms of actions, and our approach, we want to serve as an exemplar for researchers and practitioners that aim to adapt EBI's to promote chronic disease self-management within a community setting.

The main strength of using IM is that it provides a framework to structure the development and adaptation process of a program, taking into account important

elements for implementation. A first element is cultural sensitivity [33]. IM specifically helps to incorporate the needs and views of the target group and stakeholders throughout several steps of the adaptation process, while maintaining the effectiveness of programs. Another element is the use of theoretically proven methods of behavior change [23,24, 34]. IM allows adopting an action-driven approach and using the best of a multitude of relevant theories and concepts needed to potentiate behavior change within a certain context [35]. In the context of chronic disease self-management, methods such as participation, goal setting, problem solving, and (peer) modeling seem to be the most effective process factors. Key to these methods is their emphasis on patient activation and empowerment. This approach is quite different to traditional care, which tends to tell the patient what to do and how to solve the problem [11]. However, although their proven overall effectiveness in changing behavior, their impact might differ according to context and population. A close consideration of their parameters for use is required, and studies regarding their effectiveness in different target groups are needed.

There are also other remarks to be given. First, the concrete set-up of the program is based upon the behavioral goals of a varied group of chronic pain sufferers. This is a strength, as we aimed to identify the communalities regarding self-management in people suffering from different chronic diseases. However, it can also come with shortcomings. A selection of patients was interviewed, and we may have missed important information. Patients may face a myriad of different problems when trying to become owner of their health problem management. We are quite confident however that we identified issues that are central to most patients, as we found these also to be confirmed by healthcare providers that come into contact with many different patient views and needs. Still, however, we cannot make sure whether the program is still valid in different target populations, or even subgroups within a population. In principle, the program can be used in other contexts and settings as long as the target population and objectives do not differ greatly from the ones of the present program. Nevertheless we recommend screening the program using the adapted IM checklist before using the program for a different target population (e.g., patients with rare conditions, minority groups, non-native Dutch speaking groups, etc.). Second, the described EBI's and resulting intervention do not take into account environmental influence on self-management behavior. Clinicians, health care

workers, family, as well as aspects within the healthcare system should also be the target of intervention. For example, a recent review of 18 RCTs on the effects of mostly organizational interventions targeting case management, coordination of care, or enhanced multidisciplinary work showed beneficial effects of those interventions on depression outcomes in a multimorbid population [36]. Third, the current study does not describe steps 4 and 5 of IM, being implementation and evaluation. Although these steps are usually considered from the beginning, as planners already take into account implementers' needs and obstacles as well as indicators on how to measure intervention outcomes, a more thorough and detailed analysis is required. As this was not the scope of our research, future studies are needed that address these steps in detail. Fifth, some points of concern may be raised regarding evaluation. One, the program was not tailored to a group within one stage of behavioral motivation, nor does it target one behavioral goal. The program is specifically developed to meet the needs of people within different stages of behavioral motivation, and with a range of behavioral goals. This may pose difficulties when wanting to evaluate the effects of the program on one behavioral outcome. Two, evaluation of the program should both involve a process evaluation (was the program delivered as intended) as well as an effect evaluation (does the program promote self-management behavior and overall better quality of life in the target population). Evidently, implementation problems may cause bias in effectiveness measures. Researchers should take into account a range of evaluation parameters in order to be able to infer correct conclusions. Three, in order to progress research regarding community group programs, we both need effectiveness studies using RCT as well as data on the qualitative evaluation of the program. As an intermediate step, this will also involve pre-testing in various groups of patients.

4.2. Conclusion

In this study, we have presented the design of a self-management group program for chronically ill individuals for which we used an adaptation of the IM protocol. This paper adds to the literature in providing a step-wise description of how to adapt EBI's in order to create an acceptable community-based intervention to increase chronic disease self-care.

4.3. Practice Implications

Our case study may serve as an example of how health researchers and practitioners may use a planned approach and adapt EBI's in practice if they want to build a community intervention to promote chronic disease self-management. The proposed steps are informative for professionals and show and illustrate different elements to be considered during the implementation process, such as assessing the fit of the EBI's with the community, deciding on and using a theoretical model, and translating principles into action. This approach is helpful in practice, since planners do not always aim to develop an intervention from the beginning because EBI's already exist, or because of insufficient resources (time, finances) for development. As this is a complex process to undertake, the detailed reporting in this study serves to be an exemplar in the area.

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Ethical standards: The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation as approved by the Ethical board of Leuven University Hospital and with the Helsinki Declaration of 1975, as revised in 2008.

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Table 1.

Overview and basic descriptives of generic and disease-specific self-management group programs.

Name of the program	**Format**	**Originates from**	**Target population**	**Underlying Theory**	**Trainers**	**Delivery Mode**
1. Chronic Disease Self-Management Program (CDSM; Lorig et al., 2001)	Generic	US	People w/ different chronic health problems	Self-Efficacy Theory	Lay leaders	1 session per week for 6 weeks; 2 ½ hours per session; small group intervention
2. Expert Patients Program (EPP; Department of Health, 2001)	Generic	UK	People w/ different chronic conditions	Self-Efficacy Theory	Peer instructors	6-week small group intervention; 2 ½ hours per session
3. Short self-management program for patients with chronic diseases (Schreurs et al., 2003)	Generic	the Netherlands	Patients with chronic diseases	Self-regulation Theory and Proactive Coping	Professional (nurse) providers	5 2h group sessions
4. Moving on program (Williams et al., 2013)	Generic	Australia	People w/ a chronic illness	Self-Efficacy Theory and the Trans-theoretical Behavior Change Model	Two trained facilitators (health professional and lay leader)	One 3-hour session per week for seven consecutive weeks

Table 1. (Continued - 1)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
5. Self-Management program for workers with a chronic disease (Detaille et al., 2006)	Generic	The Netherlands	Workers w/ a chronic disease	Self-Efficacy Theory	Two trained peers	1 session per week for 6 weeks; 2 ½ hours per session; small group intervention
6. Self-Management Program for Patients with Long-Term Conditions (Turner et al., 2015)	Generic	UK	Patients w/ long-term conditions	Social-Learning Theory	Two trained tutors (health professional and lay tutor)	2-hour sessions during 7 consecutive weeks
7. Diabetes Self-Management Program (Lorig et al., 2009)	Disease-specific	US	Diabetes	Self-Efficacy Theory	Two trained peers w/ diabetes	1 session per week for 6 weeks; 2 ½ hours per session; small group intervention
8. “Beyond Good Intentions (Thoolen et al., 2007)	Disease-specific	The Netherlands	Diabetes, Type 2	Self-Regulation Theory and Proactive Coping	A registered nurse, experienced with diabetes	12 weeks; four 2 hour group sessions; two 1 hour individual sessions

Table 1. (Continued - 2)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
9. Self-Management Promotion Educational Program (Jalilian et al., 2014)	Disease-specific	Iran	Diabetes, Type 2	Health Belief Model	Health professionals	¾ hour to 1hour sessions during six consecutive weeks
10. Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND; Skinner et al., 2006)	Disease-specific	UK	People w/ type 2 diabetes of those who are at risk of diabetes	Leventhal's Common Sense Theory, the Dual Process Theory, Social-Learning Theory	Two professional educators	1 day or 2 ½ days program
11. X-PERT Diabetes (Deakin et al., 2006)	Disease-specific	UK	Diabetes, Type 2 and their carers	Empowerment and discovery learning	One diabetes educator	2 hour sessions per week during six weeks; 16 participants plus four to eight carers in each group
12. Healthy Changes for Living with Diabetes (Klug et al., 2008)	Disease-specific	USA	Older adults over 55 years of age w/ type 2 diabetes	Not specified	Trained peer leaders and an expert lecturer	weekly 1 ½ hour group sessions; up to 46 consecutive weeks

Table 1. (Continued - 3)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
13. Picture Good Health (Baig et al., 2015)	Disease-specific	USA	Latino Adults w/ diabetes	Self-Determination Theory, Social Cognitive Theory, Trans-Theoretical Model of Behavior Change	Trained lay leaders	1 ½ hour sessions per week during eight consecutive weeks; church-based
14. Arthritis Self-Management Program (Lorig & Holman, 1993)	Disease-specific	USA	Adults w/ arthritis	Social Cognitive Theory	Two trained leaders, minimal one peer	2 hour sessions during 6 consecutive weeks
15. Rheumatoid Arthritis Self-Management Program (Hill et al., 2005)	Disease-specific	Australia	Adults w/ RA	Cognitive Behavioral Therapy; components from Self-Efficacy Theory	Two health professionals	2 ½ hour sessions during six weeks
16. Osteoarthritis of the Knee Self-Management Program (OAK; Coleman et al., 2012)	Disease-specific	Australia	Adults w/ OA of the knee	Social Cognitive Theory and Cognitive-Behavioral Therapy	Two health professionals	2 ½ sessions during six consecutive weeks

Table 1. (Continued - 4)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
13. Picture Good Health (Baig et al., 2015)	Disease-specific	USA	Latino Adults w/ diabetes	Self-Determination Theory, Social Cognitive Theory, Trans-Theoretical Model of Behavior Change	Trained lay leaders	1 ½ hour sessions per week during eight consecutive weeks; church-based
14. Arthritis Self-Management Program (Lorig & Holman, 1993)	Disease-specific	USA	Adults w/ arthritis	Social Cognitive Theory	Two trained leaders, minimal one peer	2 hour sessions during 6 consecutive weeks
15. Rheumatoid Arthritis Self-Management Program (Hill et al., 2005)	Disease-specific	Australia	Adults w/ RA	Cognitive Behavioral Therapy; components from Self-Efficacy Theory	Two health professionals	2 ½ hour sessions during six weeks
16. Osteoarthritis of the Knee Self-Management Program (OAK; Coleman et al., 2012)	Disease-specific	Australia	Adults w/ OA of the knee	Social Cognitive Theory and Cognitive-Behavioral Therapy	Two health professionals	2 ½ sessions during six consecutive weeks

Table 1. (Continued - 5)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
17. Peer-led education in ankylosing spondylitis (Kaya et al., 2013)	Disease-specific	Turkey	Adults w/ AS	Not specified	Peer Educators	1 hour sessions per week during four weeks
18. Chronic Pain Self-Management Program (LeFort et al., 1998)	Disease-specific	USA	Adults w/ various idiopathic chronic pain	Social Cognitive Theory	Two trained leaders, minimum one experienced with chronic pain	2 hour sessions per week; during six weeks
19. Chronic Pain Class (Masayouki Inoue et al., 2014)	Disease-specific	Japan	Adults w/ chronic pain	Cognitive-Behavior Therapy	Assigned medical personnel	2 to 2 ½ hours per week; during nine weeks
20. Stroke Self-Management Program (Battersby et al., 2009)	Disease-specific	Australia	Stroke survivors	Social-Cognitive Theory	Health professionals	2 hour sessions; during eight weeks

Table 1. (Continued - 6)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
21. Restore4stroke Self-Management Intervention 'Plan Ahead' (Tielemans et al., 2016)	Disease-specific	The Netherlands	Stroke survivors	Proactive Coping	Two rehabilitation professionals	Six 2-hour sessions and a 2-hour booster session in week 10
22. PACES in Epilepsy Intervention (Fraser et al., 2015)	Disease-specific	USA	Adults with chronic epilepsy	Not specified	One epilepsy professional (rehabilitation psychologist) and a peer with epilepsy	¾ hours per week during 8 weeks
23. Healthy Active Behavioural Intervention in SCI (HABITS; Kooijmans et al., 2013)	Disease-specific	The Netherlands	Adults w/ spinal cord injury	Theory of Planned Behavior and the Transtheoretical Model of Behavior Change	One health professional	16-week intervention (one home visit, five group and five individual sessions)
24. Living with low vision (Rees et al., 2010)	Disease-specific	Australia	Older individuals w/ vision impairment	Social Cognitive Theory	Two experts in vision impairment	3 hour sessions per week during eight weeks

Table 1. (Continued - 7)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
25. Positive Self-Management Program (PSMP; Gifford, 1999)	Disease-specific	USA	People w/ HIV/AIDS	Social Cognitive Theory	Two trained leaders, minimum one peer with HIV	2 ½ hours per week during 7 weeks
26. Patient Education Program (PEP; A'Campo et al., 2010)	Disease-specific	European Consortium (EDUPARK)	Patients w/ Parkinson's disease and caregivers	Cognitive-behavioral therapy	Two health professionals	Eight weekly session of 90-minute duration
27. The "Staying Abreast, Moving Ahead" programme (SAMA;	Disease-specific	Malaysia	Breast cancer patients	Social Cognitive Theory	Two trained therapists	2-hour sessions per week; during 4 weeks
28. Self-management Programme for employees with complaints of the arm, neck or shoulder pain (CANS) (Hutting et al., 2013)	Disease-specific	The Netherlands	Patients with CANS	Attitude-Social Influence- Self-Efficacy Model	One or two trainers	2 ½ hour sessions per week; during six weeks

Table 1. (Continued - 8)

Name of the program	Format	Originates from	Target population	Underlying Theory	Trainers	Delivery Mode
29. Asthma Self-Management Program (Kotses et al., 1995)	Disease-specific	USA	Adult patients w/ asthma	Social Cognitive Theory	Health professionals	2-hour sessions per week; during 7 weeks
30. Hepatitis C Self-Management Program (Groessl et al., 2011)	Disease-specific	USA	HCV-infected patients	Self-Efficacy Theory	One psychologist and one peer	2-hour sessions per week; during 6 weeks

Table 2.

Methods and applications translated in the program.

Behavioral determinants	**Methods**	**Techniques**
Knowledge/awareness	Providing information Advance Organizers Chunking Consciousness Raising	Written and visual information in manual for participants In-session notes on flip-over Group sessions Through awareness exercises, based on brainstorm, discussions and homework assignments, participants learn to identify risky lifestyle behaviors
Attitude	Self-reevaluation Environmental reevaluation Direct experience Elaboration	Through awareness exercises, based on brainstorm and discussion sessions and writing exercises, participants learn to identify current beliefs on having a chronic disease, their lifestyle and the problems faced in daily life as well as in social interactions.
Self-efficacy	Self-monitoring of behavior Goal setting Feedback Verbal persuasion Provide and stimulate reward	Participants learn to identify desired goals and outcomes. They formulate a goal at the beginning of the group program that can be achieved throughout the course of the program. Trainers and peers provide feedback and verbal persuasion on the progress of goals during the course of the program, and hence participants' self-efficacy is promoted. Participants are encouraged to reward themselves for any progress towards their goal(s).

Subjective norm	Modeling Information about other's approval Stimulate communication to mobilize support	Peer leader and peers share examples. Participants learn to discuss their needs and goals with their general practitioner and informal social network.
Skills	Goal setting Planning coping responses Modeling Guided Practice & Feedback	Through awareness exercises, based on brainstorm, discussion and in-course assignments, participants learn to identify their needs and goals as well as barriers and how to handle these. Peer leader and peers share examples and demonstrate skills. Skills are practiced through exercises with feedback

Table 3

Overview of the self-management community program for individuals with a chronic disease.

Timing	**Session**	**Topics**
Week 1	Who am I? And how do I experience my disease?	- Getting to know each other - Overview of the program - Objectives of the program - Expectations of participants - Discussion of program rules - Trainers as facilitators - Information and brainstorm on the importance of self-management in coping with a chronic disease - Introduction to self-monitoring symptoms and behaviors - Teaser on the promotion of healthy living - Homework assignment with regard to self-monitoring
Week 4	What do I do? What do I want to change?	- Homework discussion and feedback - Information and brainstorm on the

		promotion of healthy living and mental well-being - Introduction on setting goals - Teaser on communication with health care providers - Homework assignment with regard to setting a goal
Week 7	My healthcare providers and me	- Homework discussion and feedback - Information and brainstorm on patient-carer relationship and communication - Teaser on dealing with tension and stress - Homework assignment with regard to communication with one's general practitioner
Week 10	How to deal with tension and stress	- Homework discussion and feedback - Information and brainstorm on stress, situations that cause stress and solutions to overcome it - Breathing exercises

		- Teaser on thinking positively - Homework assignment with regard to relaxing and breathing exercises
Week 13	When unhelpful thoughts dominate	- Homework discussion and feedback - Information and brainstorm on unhelpful thoughts, the link between thoughts and emotions with regard to anxiety and depression, and positive thinking - Teaser on social support - Homework assignment with regard to unhelpful thoughts in social interactions
Week 17	Follow-up session	- Homework discussion and feedback - Information and brainstorm on social support and social support seeking - Discussion and feedback on what has been accomplished the past months, plans for the near future, and long-term planning