

## Barriers and facilitators to health care providers' promotion of physical activity for individuals with mental illness: A scoping review

Krista Glowacki\*, Katie Weatherson, Guy Faulkner

University of British Columbia, 210–6081 University Boulevard, University of British Columbia, Vancouver, BC, V6T 1Z1, Canada

### ARTICLE INFO

#### Keywords:

Physical activity promotion  
Behaviour change  
Health care providers  
Mental illness

### ABSTRACT

There is substantive evidence for the importance of physical activity (PA) for people with mental illness (MI). Health care providers play an integral role in helping individuals with MI engage in PA, yet there are numerous factors that impede the promotion of PA within clinical practice.

**Objective:** The purpose of this review was to identify and theoretically analyze the barriers and facilitators for health care providers in promoting PA to individuals with MI.

**Methods:** A scoping review with systematic searches was conducted. Eligible studies required sample populations of health care providers working with individuals with MI that reported empirical data on barriers and/or facilitators to PA promotion using quantitative and/or qualitative methods. Barriers and facilitators were extracted and classified into the fourteen domains of the Theoretical Domains Framework (TDF).

**Results:** Thirty-three studies were included (15 quantitative, 12 qualitative, 6 mixed-methods), with a total of 231 factors extracted and coded to the TDF domains. Barriers and facilitators were most often classified under the domains of 'Beliefs about Consequences' and 'Environmental Context & Resources'. The most common barriers to PA promotion was a belief that clients could not overcome barriers to PA engagement, and a lack of training on how to promote PA to individuals with MI.

**Conclusions:** Education and training that incorporates behaviour change techniques for health care providers are needed to address the identified barriers and to facilitate implementation of clinical guidelines into practice. Greater integration of PA promotion within mental health care will likely require broader systemic change.

### 1. Introduction

Individuals with mental illness (MI) have a lower life expectancy than the general population by 10–20 years and are at a higher risk of developing chronic conditions and physical complications such as diabetes and heart disease (Chesney, Goodwin, & Fazel, 2014). Physical activity reduces this risk (Richardson et al., 2005; Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014). More recently, it has become evident that exercise and physical activity are beneficial for both physical and mental health of individuals with mental illness (Stanton & Reaburn, 2013) and brain functioning (Deslandes et al., 2009). Physical activity (PA) can be defined as any bodily movement produced by skeletal muscles that results in energy expenditure (Caspersen, Powell, & Christenson, 1985). Exercise is a subset of PA and is defined as physical activity that is planned, structured, repetitive and done for the purposes of improving or maintaining physical fitness (Caspersen, Powell, & Christenson, 1985). There has been a call to implement PA and exercise programming into health care services for

individuals with a mental illness (Richardson et al., 2005; Rosenbaum et al., 2018; Vancampfort et al., 2015a).

A growing body of research demonstrates that exercise is an effective intervention for various mental illnesses. Rosenbaum et al. (2014) showed that exercise has a large effect in reducing depressive and schizophrenia symptoms, and a moderate effect in improving quality of life amongst people with mental illness. Firth, Cotter, Elliott, French, and Yung (2015) demonstrated that 90 min of moderate-vigorous exercise a week can significantly reduce psychiatric symptoms as well as improve functioning for individuals with schizophrenia. Exercise has also been shown to be effective for reducing symptoms for those with clinical anxiety (Aylett, Small, & Bower, 2018). While more research is needed to understand the impact of exercise on mood for those with bipolar disorder, exercise is acknowledged as an important intervention for general health benefits in this population (Thomson et al., 2015). The evidence to support exercise for depression is the most established. Structured exercise programs have consistently been shown to significantly reduce depressive symptoms for individuals with clinical

\* Corresponding author.

E-mail addresses: [krista.glowacki@ubc.ca](mailto:krista.glowacki@ubc.ca) (K. Glowacki), [katie.weatherson@ubc.ca](mailto:katie.weatherson@ubc.ca) (K. Weatherson), [guy.faulkner@ubc.ca](mailto:guy.faulkner@ubc.ca) (G. Faulkner).

depression (Josefsson, Lindwall, & Archer, 2014; Krogh, Hjorthøj, Speyer, Gluud, & Nordentoft, 2017; Schuch et al., 2016).

In light of this evidence, international bodies acknowledge and recommend exercise for mental illness. The Royal Australian and New Zealand College of Psychiatrists (2015) recommend that exercise should be integrated in usual care for delivery in all mental health settings, and as a core element for individuals with psychiatric conditions. The National Institute for Clinical Excellence (NICE) in the National Collaborating Centre for Mental Health UK (2014) recommend that those with psychosis or schizophrenia should be offered a combined PA program by their health care provider. Due to the mature evidence base regarding exercise and depression, depression is the first and only mental health disorder in which exercise is recommended as an evidence-based treatment. The Canadian Network for Mood and Anxiety Treatments (CANMAT) recommend exercise as a primary intervention for mild-moderate Major Depressive Disorder (MDD) (Ravindran et al., 2016). NICE (2009) recommends PA as a treatment for subthreshold and mild-moderate depression. The American Psychiatric Association (2010) also identifies that exercise can be used as a monotherapy for mild depression in the acute phase after a diagnosis with monitoring of mood by a health professional. International recommendations and clinical treatment guidelines are developed to help health care providers implement evidence-based research into their clinical practice (Ravindran et al., 2016). Guidelines help to understand ‘what’ to do, but not ‘how’ to do it (implementation). Health care providers play an integral role as gatekeepers in implementing guidelines and helping individuals with a mental illness engage in PA. Adults with mental illness have also identified the importance of social influences inclusive of the support of a health professional for engaging in exercise and PA (Firth et al., 2016; Glowacki, Duncan, Gainforth, & Faulkner, 2017). Thus, we need to further understand the barriers and facilitators to PA promotion in clinical practice.

Conducting a theory-based analysis of the barriers and facilitators affecting health care providers' promotion of exercise or PA for individuals with a mental illness provides a framework for comprehensively understanding the relationship between these factors and the mechanisms by which they influence behaviour. The Theoretical Domains Framework (TDF) is an integrative framework of behaviour change that can be used to identify these modifiable factors, and then guide theory driven intervention (Cane, O'Connor, & Michie, 2012). The TDF is comprised of 14 domains (defined in the results): knowledge; skills; memory, attention and decision processes; behavioural regulation; social/professional role and identity; beliefs about capabilities; optimism; beliefs about consequences; intentions; goals; reinforcement; emotion; environmental context and resources; and social influences. These domains are constructs identified in several existing theories as determinants of behaviour change. The TDF has been used in previous reviews to understand barriers and facilitators related to health behaviour (Dobson et al., 2016; Glowacki et al., 2017; Heslehurst et al., 2014). The TDF is also part of a larger, meta-framework known as the Behaviour Change Wheel (BCW) that helps intervention developers select behaviour change techniques (BCTs). BCTs are the active ingredients within an intervention (what can be observed and replicated) designed to change behaviour (Michie, Atkins, & West, 2014). The TDF provides a behavioural diagnosis of what needs to change in a specific context for a specific behaviour to change. Specific BCTs are then linked theoretically to particular domains. Thus, conducting a TDF analysis provides the initial step for developing and implementing theory-informed behaviour change interventions (Cane et al., 2012).

Previous systematic reviews have summarized the barriers and facilitators of primary care providers to physical activity counselling and promotion (Hébert, Caughy, & Shuval, 2012; Huijg et al., 2015), and of allied and other non-medical health professionals (Crisford et al., 2018). While these reviews provide insight into the factors affecting behaviours of general clinicians working in health care, they do not

provide information related to the promotion of PA for specific client populations where barriers may be more challenging. Individuals with mental illness have unique barriers to engaging in exercise compared to the general population related to their psychiatric symptoms, physical health co-morbidities and side-effects of medication (Vancampfort, Stubbs, Ward, Teasdale, & Rosenbaum, 2015b). More recent work has been done to further understand health care providers that work specifically with individuals with mental illness, and their promotion of PA or exercise (Carlbo, Claesson, & Åström, 2018; Soundy, Stubbs, Probst, Hemmings, & Vancampfort, 2014; Stanton, Rosenbaum, Lederman, & Happell, 2017; Way, Kannis-Dymand, Lastella, & Lovell, 2018). However, to the best of our knowledge no review has synthesized this research. This is needed to inform interventions and initiatives to support effective implementation of PA into clinical practice. The primary purpose of this review was to identify the barriers and facilitators to PA promotion by health care providers working with individuals with mental illness.

## 2. Methods

### 2.1. Approach

A mixed-methods scoping review guided by Levac and colleagues' methodological framework (2010) was conducted as it is appropriate to address broader topics, understudied areas, and to include a variety of different study designs (Arksey & O'Malley, 2005). The Theoretical Domains Framework and definitions of each domain were used to categorize the barriers and facilitators extracted from the included studies (Cane et al., 2012). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses - Extension for Scoping Reviews (PRISMA-ScR) criteria guided reporting of the methods and findings (see Appendix 1) (Tricco et al., 2018). A protocol for this review was not registered.

### 2.2. Inclusion criteria

Since no review has been conducted on the PA promotion behaviours of health care providers for individuals with mental illness, we adopted a broad approach for operationalizing key concepts. The broader concept of mental illness, characterized by altered thinking, mood or behaviour, was used and includes mood disorders, schizophrenia, anxiety and personality disorders. We also included serious mental illness. Any health care provider designation was included (e.g., General Practitioner, nurse, physiotherapist, mental health worker). The broader concept of physical activity was used, which incorporates the subset of exercise as defined previously. For the purposes of this review, the definition of PA promotion was adapted from The Ottawa Charter's definition of health promotion (cited in Hyndman, 2007) and is ‘the process of enabling people to increase control over and improve their health through physical activity or exercise’. This is inclusive of, but not limited to, any encouragement of or conversation related to PA, reviewing past experience, counselling, prescription, and facilitation of, or referral to, a PA program or routine. Barriers and facilitators were defined as any physiological, psychological or socio-ecological condition reported to reduce/negatively or enhance/positively affect a health care provider's promotion of PA, respectively. Facilitators were differentiated from modes of delivery of PA promotion. These were defined as techniques, strategies or preferences that described the way in which someone promoted PA. For the purposes of this review, modes of delivery of PA promotion were not extracted.

Using these definitions, articles included in this review met the following criteria: (1) sample populations were health care providers working with individuals with mental illness, and (2) investigated barriers and/or facilitators to PA promotion. Studies using quantitative, qualitative or mixed methods were included. Articles were excluded if they did not specify the client population diagnosis that the health care

providers worked with. For example, if a study included General Practitioners within primary care, but did not specify any client populations with a mental illness such as depression, it was excluded. Commentaries, opinion pieces, and reviews of existing literature were excluded if they did not have any empirical data (acquired by observation or experimentation).

### 2.3. Search strategy and study selection

Articles were identified using an iterative process. First, an experienced librarian was consulted prior to starting the search to help develop the search strategy. Articles found from a previous study (Glowacki et al., 2017) were reviewed by the librarian to identify important concepts for the electronic database search (Happell, Platania-Phung & Scott, 2013; Happell, Platania-Phung, Scott, & Nakivell, 2013). The key concepts of health care provider attitude, PA/health promotion, and mental illness were identified. Subject headings and free text terms reflective of our key concepts and informed by similar reviews (Crisford et al., 2018; Huijg et al., 2015; Verhaeghe, De Maeseneer, Maes, Van Heeringen, & Annemans, 2011) were chosen in collaboration with the librarian and the search strategy was refined.

An electronic database search was then conducted in Ovid MEDLINE (1946 to present), PsycINFO (1597 to present), EMBASE (1974 to present), and Cochrane (CENTRAL AND CDSR; 2005 to present) by the second author in September 2018. See Appendix 2 for a detailed search strategy for PsycINFO. Subject headings were specific to each database (using the thesaurus feature). Subject headings for all key concepts were used in every database except for PsycINFO. The final search in PsycINFO did not include the subject heading terms for mental illness as this excessively narrowed the search results. Free text terms were the same in each database. Limits put on searches were for English language. In addition, a search of google scholar using key concepts (exercise OR “physical activity” OR “health promotion”) AND (“health care provider”) was done and the first 10 pages of titles were screened for eligibility.

After removal of duplicates ( $n = 659$ ), two reviewers screened articles by title and abstract first according to inclusion criteria, and full-text articles were obtained as needed. In addition, reference lists of eligible articles and other relevant articles (editorials, opinion pieces, reviews) were screened to identify any potentially eligible articles that were missed. Once screening was completed by the first and second author, the list of articles to include was reviewed by the third author to confirm the studies met inclusion criteria, and that no relevant articles were missed. Any difference of opinion between all authors was resolved by discussion.

### 2.4. Data extraction and analysis

Together, the two authors extracted data from the eligible studies using a data extraction form including: provider type, practice setting, client population and country. To identify barriers and facilitators, the first two authors independently read through each eligible article line by line, and extracted any section of text if it met the aforementioned definitions of barrier or facilitator. Barriers and facilitators were only extracted if it was clearly stated they affected the health care providers' behaviour of promoting PA. We distinguished text as a barrier or facilitator based on how the authors of each article reported and classified the factor influencing PA promotion. Data extraction methods varied based on the type of study and data presented. For quantitative studies where data were presented as the number of respondents endorsing a statement out of the total respondents, data was extracted as a dichotomous yes or no out of the total number of respondents. As such, Likert-style scales or other methods of demonstrating levels of agreement were dichotomized where any endorsement (e.g. agree, strongly agree) was treated as “yes”, or disagreement (e.g. strongly disagree, disagree) was treated as a “no” (Weatherston, Gainforth, & Jung, 2017).

Ambivalence or neutral statements were not extracted as we were concerned with identifying factors that individuals perceived to be the most salient to their own behaviour. Barriers and facilitators were extracted from qualitative studies if they were mentioned by the authors in the results as being relevant to PA promotion by health care providers. Authors met to compare extraction and consensus was met through discussion.

Next, the TDF was used to categorize the barriers and facilitators. The first two authors independently categorized the extracted barriers and facilitators into any relevant domains within the TDF, using domain definitions (Cane et al., 2012). Given that the TDF domains are not mutually exclusive (Michie et al., 2005), some items were coded to multiple domains (e.g., lack of training was always coded to ‘Knowledge’, ‘Skills’ and ‘Environmental Context & Resources’ domains, and client barriers were always coded to ‘Beliefs about Consequences’ and ‘Social Influences’). Upon completing categorization, the first two authors met to assess agreement on the TDF domain categorization. The authors solved discrepancies through discussion, rereading source material, and collaboration. When no agreement could be reached, the opinion of the third author determined the final result. The third author also reviewed final TDF categorizations. Similar factors were categorized into sub-themes. Important TDF domains were those that had multiple sub-themes, whereby the majority of participants in quantitative studies agreed on the presence of the factor, and more than one qualitative study identified the sub-theme.

## 3. Results

### 3.1. Search results

Fig. 1 displays the flow diagram of search and study selection. A total of 33 articles were included for analysis (Bartlem et al., 2016; Brand et al., 2016; Bressington et al., 2016; Bressington et al., 2018; Browne, Mihas, & Penn, 2016; Burks & Keeley, 1989; Burton, Pakenham, & Brown, 2010; Carlbo et al., 2018; Faulkner & Biddle, 2002; Ganiah, Al-Hussami, & Alhadidi, 2017; Happell, Scott, Platania-Phung, & Nankivell, 2012; Happell, Platania-Phung, & Scott, 2013a; Happell, Scott, & Platania-Phung, 2013b; Harding, 2013; Joyce & O'Tuathaigh, 2014; Kinnafick, Papathomas, & Regoczi, 2018; Leutwyler, Hubbard, Jeste, & Vinogradov, 2012; Patel, Schofield, Kolt, & Keogh, 2011; Phongsavan et al., 2007; Radovic et al., 2018; Robson, Haddad, Gray, & Gournay, 2013; Searle et al., 2012; Soundy et al., 2014; Stanton, 2013; Stanton, Franck, Reaburn, & Happell, 2015a; Stanton, Happell, & Reaburn, 2015b; Stanton et al., 2017; Stubbs et al., 2014a; Stubbs et al., 2014b; Verhaeghe, Maeseneer, Maes, Heeringen, & Annemans, 2013; Way et al., 2018; Wendt, 2005; Zanetidou et al., 2017).

### 3.2. Characteristics of included studies

Table 1 summarizes each article included in the review based on provider type, practice setting, client population and country. Fifteen studies employed quantitative methods (Bartlem et al., 2016; Brand et al., 2016; Bressington et al., 2018; Burks & Keeley, 1989; Burton et al., 2010; Ganiah et al., 2017; Happell et al., 2013a; Joyce & O'Tuathaigh, 2014; Phongsavan et al., 2007; Robson et al., 2013; Stanton, 2013; Stanton et al., 2015b; Stanton et al., 2017; Wendt, 2005; Zanetidou et al., 2017) and twelve used qualitative methods of data collection (Bressington et al., 2016; Browne et al., 2016; Carlbo et al., 2018; Faulkner & Biddle, 2002; Happell et al., 2012; Kinnafick et al., 2018; Leutwyler et al., 2012; Patel et al., 2011; Searle et al., 2012; Soundy et al., 2014; Verhaeghe et al., 2012; Way et al., 2018). Six studies used a mixed-methods approach to data collection (Happell et al., 2013b; Harding, 2013; Radovic et al., 2018; Stanton et al., 2015a; Stubbs et al., 2014a; Stubbs et al., 2014b); however, barriers and/or facilitators were only reported quantitatively in two studies (Stanton

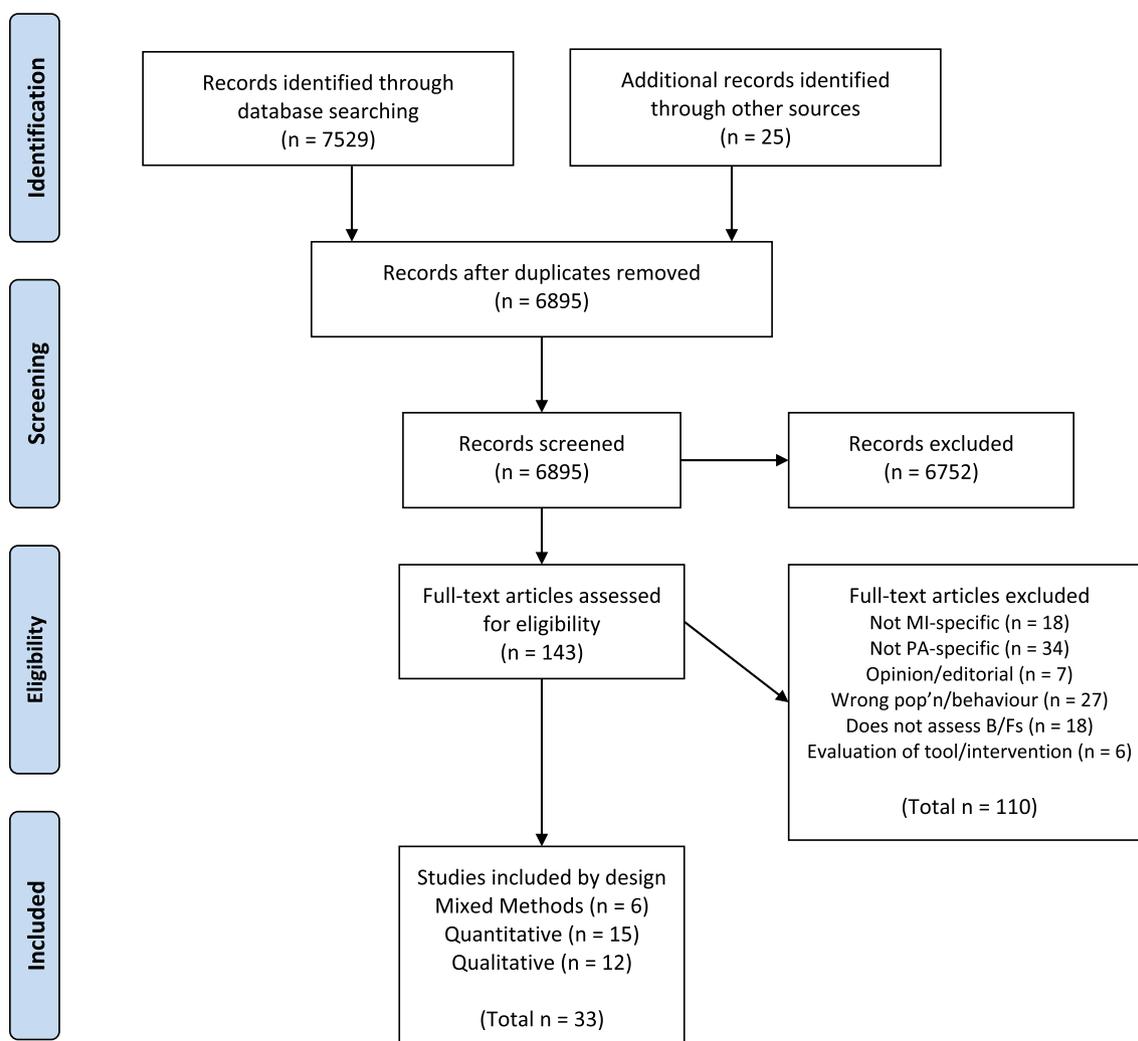


Fig. 1. Flow diagram of search and study selection  
Adapted from The PRISMA Group (2009)

et al., 2015a; Radovic et al., 2018), and qualitatively in three studies (Happell et al., 2013b; Stubbs et al., 2014a; Stubbs et al., 2014b). Data from two studies by Happell et al. (2013a and 2013b) and two studies by Stubbs et al. (2014a and 2014b) were from the same study samples.

Quantitative data represented a total of 3246 participants. The majority of providers in each study were female except for in five studies (Burks & Keeley, 1989; Burton et al., 2010; Ganiah et al., 2017; Joyce & O'Tuathaigh, 2014; Stanton et al., 2015a). Two studies did not report percentage female (Brand et al., 2016; Stanton et al., 2015b). Qualitative data represented 1327 participants, with the majority being female. One mixed-methods study reported barriers and facilitators quantitatively and qualitatively (Harding, 2013). This study included 73 staff providing care to individuals with MI at group homes in the USA.

### 3.3. Barriers and facilitators

After discussion, the first two authors identified 133 barriers and 98 facilitators across the 33 articles. Of these 231 data points, consensus on TDF domain assignment was achieved through discussion in all but one case, which was reviewed by the last author to determine final categorization. Tables 2 and 3 display the barriers and facilitators to PA promotion, respectively, organized by data type (quantitative and qualitative) and TDF categorization. The most prominent TDF domains were 'Beliefs about consequences', 'ECR'. The following section

provides a narrative synthesis of key barriers and facilitators within the TDF.

#### 1. Knowledge: an awareness of the existence of something

Lack of awareness of the evidence supporting PA in the treatment of MI was seen as a barrier, whereas being aware of the therapeutic potential of PA was a facilitator to the promotion of PA by providers. Similarly, lack of knowledge/training on how to promote PA to clients was a barrier, and the reverse, having knowledge/previous training was a facilitator. Most providers referred to (a lack of) PA-specific training, while exercise physiologists identified (a lack of) training on how to promote PA to individuals with MI.

#### 2. Skills: an ability or proficiency acquired through practice

Similar to the Knowledge domain, (lack of) training and (lack of) knowledge on how to promote/prescribe PA were prominent influencers of provider behaviour. Other facilitators coded to this domain included providers having personal experience with PA and feeling competent to prescribe PA.

#### 3. Social/Professional Role and Identity: a coherent set of behaviours and displayed personal qualities of an individual in a social or work setting

A facilitator amongst qualitative studies was that various health care

**Table 1**  
Characteristics of included studies.

	Type of Study	Method	Analysis Approach	Practitioner Type	Practitioner Age	Practice Setting	n	n Female	Client Population	Country
Bartlem et al. (2016)	Quantitative	Questionnaire (telephone)	Agreement	Registered Nurses, Psychiatrists and other allied health	20-49 (years) n = 85	Community mental health services	151	88	Individuals seeking community mental health care	New South Wales, Australia
Brand et al. (2016)	Quantitative	Questionnaire (online)	Frequency	Staff members involved in PAEP	NR	Psychiatric Hospital (inpatient & outpatient)	48	NR	Inpatients with psychiatric disorders (80% Personality & Mood disorders)	Switzerland (German speaking area)
Bressington et al. (2016)	Qualitative	Interviews	Inductive thematic analysis	Registered Mental Health Nurses	31-40 (years) n = 6, > 40 n = 5	Community psychiatric service	11	6	Individuals with serious mental illness	Hong Kong
Bressington et al. (2018)	Quantitative	Questionnaire (PHASE)	Agreement	Registered Psychiatric and General Nurses	< 29 (years) n = 76, 30-39 n = 139, 40-49 n = 120, 50 + n = 119	Inpatient psychiatric units or outpatient/community settings	481	275	People with serious mental illness	Hong Kong, Japan, Qatar
Browne et al. (2016)	Qualitative	Focus Groups	Constant Comparison	Clinicians providing treatment to individuals with SMI	Mean age in years = 37.3 ± 10.1	Local clinics	14	9	Adults with serious mental illness	U.S.A. (southeastern state)
Burks and Keeley (1989)	Quantitative	Questionnaire (mail)	Frequency	Psychotherapists	Mean age in years = 46.6	Private practice (73.4%)	232	83	Depression (21.2%) and Anxiety (18.1%) most frequently reported	NR
Burton et al. (2010)	Quantitative	Questionnaire	Agreement	Psychologists	Mean age in years = 42.12 ± 8.04 (Range = 22-75 years)	Private, community, not for profit, education, hospital/primary care/GP clinic, corporate/commercial	236	200	Majority mental health client issues (e.g. anxiety, depression, mental illness, phobias, psychosis)	Australia (Queensland)
Carlbo et al. (2018)	Qualitative	Focus Groups	Qualitative content analysis	Registered Nurses and nurse assistants	NR	Inpatient unit at hospital and associated outpatient unit	12	9	Adults with schizophrenia	Western Sweden
Faulkner and Biddle (2002)	Qualitative	Semi-structured interviews	Thematic analysis	Mental Health Nurses	Mean age in years = 35.25 ± 6.98	Mental health trust (inpatient)	12	9	NR	United Kingdom
Ganiyah et al. (2017)	Quantitative	Questionnaire (PHASE)	Agreement	Mental Health Nurses	Mean age in years = 32.5 ± 7.22	Mental health hospitals	202	81	Individuals with mental illness	Jordan
Happell et al. (2012)	Qualitative	Focus Groups	Thematic analysis	Mental Health Nurses	NR	Community mental health, acute inpatient & other	38	NR	People seeking mental health services	Australia (Queensland)
Happell et al., 2013a <sup>a</sup>	Quantitative	Questionnaire (PHASE)	Agreement	Members of the Australian College of Mental Health Nurses	NR	Public inpatient and community settings	643	468	Individuals with serious mental illness	Australia
Happell et al., 2013b <sup>a</sup>	Mixed- Methods (Extracted Qualitative)	Questionnaire (Open-ended questions)	Thematic analysis	Members of the Australian College of Mental Health Nurses	NR	Mental health services (public and private)	643	468	Individuals with serious mental illness	Australia
Harding (2013)	Mixed- Methods	Questionnaire (closed- and open-ended questions)	Agreement & themes	Direct Care Staff	NR	Mental health group homes	73	NR	Individuals with serious mental illness living in group homes	U.S.A. (one New England state)
Joyce and O'Tuathailgh (2014)	Quantitative	Questionnaire	Frequency	General Practitioners	Mean age in years = 48.5 ± 9.5	Primary care and private clinics	102	34	Individuals with chronic illnesses, including depression	Ireland
Kinnafick et al. (2018)	Qualitative	Interviews	Thematic analysis	Healthcare assistants	Mean age in years = 30.27 ± 7.75	Secure mental health hospital	11	6	Individuals (adolescents, adults) with severe mental illness	United Kingdom

(continued on next page)

Table 1 (continued)

	Type of Study	Method	Analysis Approach	Practitioner Type	Practitioner Age	Practice Setting	n	n Female	Client Population	Country
Leutwyler et al. (2012)	Qualitative	Interviews	Constant comparison	Mental Health Staff	Range ≥21 years	Transitional residential and day treatment centre, locked residential facility & intensive case management program	23	NR	Older adults with schizophrenia	U.S.A.
Patel et al. (2011)	Qualitative	Interviews	Thematic analysis	General Practitioners	Mean age in years = 50.8 ± 7.1	General practice settings	15	10	Individuals with depression	Auckland, New Zealand
Phongsavan, Meron, Bauman, and Wagner (2007)	Quantitative	Questionnaire (email)	Frequency	Mental Health Therapists	NR	Community health, hospital, private clinics, specialist centres, schools	51	38	NR	Australia (Southwest Sydney)
Radovic, Melvin, and Gordon (2018)	Mixed- methods (Extracted Quantitative)	Questionnaire (EMIQ-adapted for adolescents)	Frequency	Mental Health Clinicians	25–35 yrs (60%), 36–45 yrs (20%), 46–55 yrs (13.6%), < 25 yrs (3.2%)	NR	125	100	Adolescents with Depression	Australia
Robson et al. (2013)	Quantitative	Questionnaire (PHASE)	Agreement	Mental Health Nurses	20–30 (years) n = 72, 31–40 n = 189, 41–50 n = 182, > 50 n = 124	NHS Mental Health Trust	585	365	People with serious mental illness	United Kingdom
Searle et al. (2012)	Qualitative	Semi-structured telephone interviews	Emerging Themes	General Practitioners	NR	Primary Care	15	NR	Individuals with depression	United Kingdom (Bristol & Exeter)
Soundy et al. (2014)	Qualitative	Questionnaire	Thematic analysis-Frequency	Specialist Mental Health Psychotherapists	NR	Inpatient, community, outpatient or combination	40	30	Individuals with schizophrenia	International
Stanton (2013)	Quantitative	Questionnaire	Frequency	Accredited Exercise Physiologists	> 50% 26–35 years	Variety	61	40	People with mental illness (depression most common condition)	Australia
Stanton et al. (2015a)	Mixed Methods (Extracted Quantitative)	Questionnaire	Frequency	General Practitioners	Mean age in years = 46.4 ± 8.9 (Range = 31–67 years)	NR	20	9	People with depression	Australia (Central Queensland)
Stanton et al. (2015b)	Quantitative	Questionnaire (EMIQ-HP)	Frequency	Nurses	Mean age in years = 42.8 ± 13.5 (Range = 21–70 years)	Adult inpatient mental health facilities	34	NR	Adults with mental illness	Australia
Stanton et al. (2017)	Quantitative	Questionnaire (EMIQ-HP)	Frequency	Accredited Exercise Physiologists	Mean age in years = 33.3 ± 10.4	Variety	81	61	People with mental illness	Australia
Stubbs et al., 2014a <sup>b</sup>	Mixed- Methods (Extracted Quantitative)	Questionnaire (online)	Thematic analysis	Physical Therapists	Mean age in years = 40 ± 11.2	Inpatient, community, outpatient or combination	151	106	Individuals with schizophrenia	International (31 countries - mostly European)
Stubbs et al., 2014b <sup>b</sup>	Qualitative	Questionnaire (closed- and open-ended)	Content thematic analysis	Physical Therapists	Mean age in years = 40 ± 11.2	Inpatient, community, outpatient or combination	151	106	Individuals with schizophrenia	International (31 countries - mostly European)
Verhaeghe et al. (2013)	Qualitative	Focus Groups	Descriptive	Mental Health Nurses	Mean age in years = 34.8 ± 8.9	Working in sheltered housing	17	13	Adults with mental disorders living in sheltered housing	Belgium (Flanders region)
Way et al. (2018)	Qualitative	Questionnaire	Thematic analysis-frequency	Mental Health Professionals	Mean age in years = 46.5 ± 11.1	NR	325	263	People seeking mental health services	Australia & New Zealand
Wendt (2005)	Quantitative	Questionnaire	Frequency	Licensed Psychologists	Mean age in years = 51.8 ± 9.4	Private office, hospital, agency	174	97	Individuals participating in psychotherapy	U.S.A. (Massachusetts)

(continued on next page)

Table 1 (continued)

	Type of Study	Method	Analysis Approach	Practitioner Type	Practitioner Age	Practice Setting	n	n Female	Client Population	Country
Zanetidou et al. (2017)	Quantitative	Questionnaire	Frequency	Primary Care Physicians	NR	Primary care with psychiatric consultation-liaison programs	20	11	Individuals with late-life major depression	Italy

NR = Not Reported PAEP = Physical activity & exercise programs PHASE = Physical Health Attitude Scale for Mental Health Nurses EMIO-HP = Exercise in Mental Illness Questionnaire-Health Practitioners NHS = National Health Service.

<sup>a</sup> Happell et al., 2013a and 2013b are from same study sample.

<sup>b</sup> Stubbs et al., 2014a and 2014b are from the same study, reporting on different results to open-ended questions.

providers (General Practitioners, exercise physiologists, mental health nurses) believed that they have a key role in PA promotion and delivery. Participants reported that in their positions, they were best positioned and appropriate individuals to promote PA and felt that information coming from them would legitimize the prescription to clients. Correspondingly, very few providers reported that promoting PA was not part of their role and would be best delivered by someone else. However, in two qualitative studies, there was some uncertainty about who can prescribe PA. Other barriers within this domain included providers feeling too inactive themselves to promote PA and thinking that it was the client's own responsibility or choice to be active (and not their responsibility to promote PA).

4. **Beliefs about Capabilities:** acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use.

Lack of confidence to promote PA and feeling it was difficult to do so were identified as barriers, however only in two studies. There was also a reported feeling of difficulty in integrating PA at an institutional level. Mostly, participants reported having the confidence and competence to promote PA/exercise to clients. No facilitators were identified within the qualitative studies.

5. **Optimism:** confidence that things will happen for the best or that desired goals will be attained

Amongst quantitative studies and one qualitative study, the belief that clients will not adhere to an exercise program was identified. Within qualitative studies, pessimism about change was identified as a barrier in two studies, and optimism about the benefits of PA for MI treatment was identified as a facilitator in one study. One quantitative study identified that the majority of participants agreed that clients would change their physical activity because of the care they provide.

6. **Beliefs about Consequences:** acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation.

This was the most predominant TDF domain for both barriers and facilitators to PA promotion across both quantitative and qualitative studies. Reflecting the optimism domain, providers felt that people with MI would not adhere to an exercise program. Many acknowledged that clients themselves experience important barriers to being active, including a lack of motivation, MI symptoms, poor physical health, and other environmental factors (e.g., financial limitations, transportation issues, poor weather and lack of family support), and so providers do not promote PA. Some providers were not convinced that PA was a helpful or legitimate treatment option for MI, and in some cases might exacerbate MI symptoms. Two qualitative studies identified that PA was not considered appropriate in inpatient settings where patients may be acutely ill. Other negative consequences included that it takes time away from other treatments, or causes an additional burden on clients, and that it may cause damage to the therapeutic relationship, violate human rights or lead to physical injury of the client or clinician.

Conversely, many reported that PA was beneficial to clients for many reasons: treating MI symptoms, reducing medication needs, improving physical health, providing daily structure and/or a positive distraction, and providing opportunities for socialization. Additionally, providers believed that PA is an appropriate treatment method for MI and that clients would find this option acceptable.

7. **Reinforcement:** increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus

No barriers were identified in this domain. In one study, nurses reported that clients describing the benefits of PA reinforced the

**Table 2**  
Barriers identified to physical activity and exercise promotion.

TDF Domain	Barriers (Quantitative)	Barriers (Qualitative)
Knowledge	<p><b>Lack of knowledge on how to promote PA<sup>a</sup></b> 174/232 (Burks &amp; Keeley, 1989) 31/126 (Radovic et al., 2018) 37/73 (Harding, 2013) 8/34 (Stanton et al., 2015a)</p> <p><b>Unaware of PA evidence for treatment of MI</b> 29/236 (Burton et al., 2010) 2/20 (Zanetidou et al., 2017)</p> <p><b>Lack of PA training<sup>a</sup></b> 135/232 (Burks &amp; Keeley, 1989) 48/48 (Brand et al., 2016) 79/126 (Radovic et al., 2018) 167/236 (Burton et al., 2010) 335/480 (Bressington et al., 2018) 79/102 (Joyce &amp; O'Tuathaigh, 2014) 427/643 (Happell et al., 2013a) 166/174 (Wendt, 2005)</p> <p><b>Lack of MI training<sup>a</sup></b> 32/61 (Stanton, 2013) 54/81 (Stanton et al., 2017)</p>	<p><b>Lack of knowledge on how to promote PA<sup>a</sup></b> (Carlbo et al., 2018; Harding, 2013)</p> <p><b>Unaware of PA evidence for treatment of MI</b> (Carlbo et al., 2018; Faulkner &amp; Biddle, 2002; Searle et al., 2012; Stubbs et al., 2014b)</p> <p><b>Lack of training<sup>a</sup></b> (Way et al., 2018)</p>
Skills	<p><b>Do not know how to promote PA<sup>a</sup></b> 31/126 (Radovic et al., 2018) 37/73 (Harding, 2013) 8/34 (Stanton et al., 2015a)</p> <p><b>Lack of PA training<sup>a</sup></b> 135/232 (Burks &amp; Keeley, 1989) 48/48 (Brand et al., 2016) 79/126 (Radovic et al., 2018) 167/236 (Burton et al., 2010) 335/480 (Bressington et al., 2018) 79/102 (Joyce &amp; O'Tuathaigh, 2014) 427/643 (Happell et al., 2013a) 166/174 (Wendt, 2005)</p> <p><b>Lack of MI training<sup>a</sup></b> 32/61 (Stanton, 2013) 54/81 (Stanton et al., 2017)</p>	<p><b>Do not know how to promote PA<sup>a</sup></b> (Carlbo et al., 2018; Harding, 2013)</p> <p><b>Lack of training<sup>a</sup></b> (Way et al., 2018)</p>
Social/Professional Role and Identity	<p><b>Not part of my job/role</b> 4/125 (Radovic et al., 2018) 70/579 (Robson et al., 2013) 2/34 (Stanton et al., 2015a)</p> <p><b>Best delivered by someone else (e.g., exercise specialist)</b> 35/126 (Radovic et al., 2018) 9/34 (Stanton et al., 2015a)</p> <p><b>Lack of personal PA engagement</b> 17/73 (Harding, 2013)</p> <p><b>PA is the client's personal choice</b> 4/174 (Wendt, 2005)</p>	<p><b>Not/no longer part of my job/role</b> (Carlbo et al., 2018; Way et al., 2018)</p> <p><b>Uncertainty about who can prescribe PA</b> (Carlbo et al., 2018; Kinnafick et al., 2018)</p> <p><b>Best delivered by someone else (e.g., exercise specialist)</b> (Way et al., 2018)</p> <p><b>Lack of personal PA engagement</b> (Way et al., 2018)</p> <p><b>PA is the client's responsibility</b> (Faulkner &amp; Biddle, 2002)</p>
Beliefs about Capabilities	<p><b>Lack of confidence to promote PA</b> 6/73 (Harding, 2013)</p>	<p><b>Doubt in competency</b> (Kinnafick et al., 2018)</p> <p><b>Difficult to integrate PA into institutional operation<sup>a</sup></b> (Leutwyler et al., 2012)</p>
Optimism	<p><b>Believe clients will not adhere<sup>a</sup></b> 29/126 (Radovic et al., 2018) 15/20 (Stanton et al., 2015b) 33/61 (Stanton, 2013) 2/34 (Stanton et al., 2015a) 66/174 (Wendt, 2005) 10/20 (Zanetidou et al., 2017)</p>	<p><b>Believe clients will not adhere<sup>a</sup></b> (Faulkner &amp; Biddle, 2002)</p> <p><b>Pessimistic about change</b> (Happell et al., 2012; Searle et al., 2012)</p>

(continued on next page)

Table 2 (continued)

TDF Domain	Barriers (Quantitative)	Barriers (Qualitative)
Beliefs about Consequences	<p><b>Believe clients will not adhere<sup>a</sup></b>                      29/126 (Radovic et al., 2018)                      15/20 (Stanton et al., 2015b)                      33/61 (Stanton, 2013)                      2/34 (Stanton et al., 2015a)                      66/174 (Wendt, 2005)                      10/20 (Zanetidou et al., 2017)</p> <p><b>Client barriers prevent them from promoting PA:<sup>a</sup></b>                      1. <b>Unmotivated</b>                      54/73 (Harding, 2013)                      184/576 (Robson et al., 2013)                      NR/480 (Bressington et al., 2018)                      144/202 (Ganiah et al., 2017)                      45/174 (Wendt, 2005)</p> <p>2. <b>MI symptoms</b>                      15/126 (Radovic et al., 2018)</p> <p>3. <b>Poor physical health</b>                      3/125 (Radovic et al., 2018)                      1/34 (Stanton et al., 2015a)                      6/20 (Zanetidou et al., 2017)</p> <p><b>PA not helpful/legitimate for treatment of MI</b>                      1/126 (Radovic et al., 2018)                      5/236 (Burton et al., 2010)                      7/61 (Phongsavan et al., 2007)                      29/236 only for chronic illness (Burton et al., 2010)                      6/61 (Phongsavan et al., 2007)                      1/34 (Stanton et al., 2015a)                      10/20 (Zanetidou et al., 2017)</p> <p><b>Exacerbate MI symptoms</b>                      34/174 (Wendt, 2005)</p> <p><b>Damage to therapeutic relationship<sup>a</sup></b>                      31/174 (Wendt, 2005)</p> <p><b>Client physical injury</b>                      1/126 (Radovic et al., 2018)                      18/73 (Harding, 2013)                      1/34 (Stanton et al., 2015a)</p> <p><b>Takes time away from other treatment</b>                      19/236 (Burton et al., 2010)</p> <p><b>Will create unacceptable burden to client</b>                      6/236 (Burton et al., 2010)</p> <p><b>Fear of human rights violation<sup>a</sup></b>                      11/73 (Harding, 2013)</p>	<p><b>Believe clients will not adhere<sup>a</sup></b> (Faulkner &amp; Biddle, 2002)</p> <p><b>Client barriers prevent them from promoting PA:<sup>a</sup></b>                      1 <b>Unmotivated</b> (Carlbo et al., 2018; Faulkner &amp; Biddle, 2002; Happell et al., 2013b; Way et al., 2018)                      2 <b>MI symptoms</b> (Happell et al., 2012; Kinnafick et al., 2018; Verhaeghe et al., 2013; Way et al., 2018)                      3 <b>Poor physical health</b> (Way et al., 2018)                      4 <b>Difficulty with social interaction</b> (Way et al., 2018)                      5 <b>Environmental factors</b> (Happell et al., 2012; Way et al., 2018)</p> <p><b>PA not legitimate for treatment of MI</b> (Kinnafick et al., 2018; Way et al., 2018)</p> <p><b>Exacerbate MI symptoms (e.g., feelings of low self-esteem, positive symptoms of schizophrenia)</b> (Carlbo et al., 2018; Searle et al., 2012)</p> <p><b>Damage to therapeutic relationship<sup>a</sup></b> (Way et al., 2018)</p> <p><b>PA will not manage crisis situations</b> (Faulkner &amp; Biddle, 2002; Leutwyler et al., 2012)</p> <p><b>Clients pose risk to clinician (in secure settings)</b> (Kinnafick et al., 2018)</p>
Reinforcement	None identified	None identified
Intentions	<p><b>Uninterested in prescribing PA</b>                      1/126 (Radovic et al., 2018)</p> <p><b>Other treatment priorities<sup>a</sup></b>                      77/174 (Wendt, 2005)</p>	<p><b>No motivation to prescribe PA</b> (Way et al., 2018)</p> <p><b>Treatment of other MI symptoms are a priority<sup>a</sup></b> (Faulkner &amp; Biddle, 2002; Happell et al., 2012; Happell et al., 2013b; Kinnafick et al., 2018; Leutwyler et al., 2012; Way et al., 2018)</p> <p><b>Client safety is a priority<sup>a</sup></b> (Kinnafick et al., 2018)</p>
Goals	None identified	None identified
Memory, Attention, Decision Process	<p><b>Other treatment priorities<sup>a</sup></b>                      77/174 (Wendt, 2005)</p>	<p><b>Treatment of other MI symptoms are a priority<sup>a</sup></b> (Faulkner &amp; Biddle, 2002; Happell et al., 2012; Happell et al., 2013b; Kinnafick et al., 2018; Leutwyler et al., 2012; Way et al., 2018)</p> <p><b>PA is forgotten in patient care planning</b> (Carlbo et al., 2018)</p> <p><b>Client safety is a priority<sup>a</sup></b> (Kinnafick et al., 2018)</p>

(continued on next page)

Table 2 (continued)

TDF Domain	Barriers (Quantitative)	Barriers (Qualitative)
Environmental Context & Resources	<p><b>Lack of PA training<sup>a</sup></b>                      135/232 (Burks &amp; Keeley, 1989)                      79/126 (Radovic et al., 2018)                      167/236 (Burton et al., 2010)                      48/48 (Brand et al., 2016)                      335/480 (Bressington et al., 2018)                      79/102 (Joyce &amp; O’Tuathaigh, 2014)                      427/643 (Happell et al., 2013a)                      166/174 (Wendt, 2005)</p> <p><b>Lack of MI training<sup>a</sup></b>                      32/61 (Stanton, 2013)                      54/81 (Stanton et al., 2017)</p> <p><b>Lack of time</b>                      1/125 (Radovic et al., 2018)                      17/73 (Harding, 2013)                      2/34 (Stanton et al., 2015a)                      22/174 (Wendt, 2005)</p> <p><b>Lack of resources</b>                      7/48 (Brand et al., 2016)</p> <p><b>Lack of infrastructure</b>                      12/20 (Zanetidou et al., 2017)</p>	<p><b>Lack of training<sup>a</sup></b> (Way et al., 2018)</p> <p><b>Lack of time</b> (Carlbo et al., 2018; Happell et al., 2012; Verhaeghe et al., 2013; Way et al., 2018)</p> <p><b>Lack of resources</b> (Happell et al., 2012; Harding, 2013; Searle et al., 2012; Way et al., 2018)</p> <p><b>Shortage of personnel to supervise activities</b> (Carlbo et al., 2018; Kinnafick et al., 2018)  <b>Lack of/inconsistent programs</b> (Bressington et al., 2016; Happell et al., 2012; Happell et al., 2013b; Leutwyler et al., 2012; Way et al., 2018)  <b>Difficult to integrate into institutional operation<sup>a</sup></b> (Leutwyler et al., 2012)  <b>Lack of structure in provision of care</b> (Carlbo et al., 2018)</p>
Social Influences	<p><b>Client barriers prevent them from promoting PA:<sup>a</sup></b>  <b>1 Unmotivated</b>                      54/73 (Harding, 2013)                      184/576 (Robson et al., 2013)                      NR/480 (Bressington et al., 2018)                      144/202 (Ganiah et al., 2017)                      45/174 (Wendt, 2005)</p> <p><b>4 MI symptoms</b>                      15/126 (Radovic et al., 2018)</p> <p><b>5 Poor physical health</b>                      3/125 (Radovic et al., 2018)                      1/34 (Stanton et al., 2015a)                      6/20 (Zanetidou et al., 2017)</p> <p><b>Clients do not want PA counselling from MH professional</b>                      19/236 (Burton et al., 2010)                      29/174 (Wendt, 2005)</p> <p><b>Damage to therapeutic relationship<sup>a</sup></b>                      31/174 (Wendt, 2005)</p>	<p><b>Client barriers prevent them from promoting PA:<sup>a</sup></b>  <b>1 Unmotivated</b> (Carlbo et al., 2018; Faulkner &amp; Biddle, 2002; Happell et al., 2013b; Way et al., 2018)  <b>2 MI symptoms</b> (Happell et al., 2012; Kinnafick et al., 2018; Verhaeghe et al., 2013; Way et al., 2018)  <b>3 Poor physical health</b> (Way et al., 2018)  <b>4 Difficulty with social interaction</b> (Way et al., 2018)  <b>5 Environmental factors</b> (Happell et al., 2012; Way et al., 2018)</p> <p><b>Lack of supportive others (society, other health professionals)</b> (Carlbo et al., 2018; Happell et al., 2012)</p> <p><b>Damage to therapeutic relationship<sup>a</sup></b> (Way et al., 2018)  <b>Stigma about MI (professionals and community)</b> (Happell et al., 2012; Verhaeghe et al., 2013)  <b>Clients pose risk to clinician (in secure settings)</b> (Kinnafick et al., 2018)</p>
Emotion	<p><b>Fear of human rights violation<sup>a</sup></b>                      11/73 (Harding, 2013)</p>	<p><b>Feelings of concern (physical health risk or hypocritical advice)</b> (Way et al., 2018)</p>
Behavioural Regulation	<p><i>None identified</i></p>	<p><i>None identified</i></p>

PA = Physical activity AWD = Adults with depression MH = Mental health MI = Mental illness NR = Not reported.

<sup>a</sup> Coded to multiple domains.

provider to continue to recommend PA to other clients.

**8. Intentions:** a conscious decision to perform a behaviour or a resolve to act in a certain way

One qualitative study identified that providers lack the motivation to prescribe and investigate PA as a treatment option for their clients. However, only one individual from one quantitative study agreed that they were uninterested in prescribing exercise for adolescents with depression. One qualitative study identified that PA is often forgotten about during patient care planning. A key barrier across six qualitative studies was that the treatment of critical symptoms was a priority before encouraging PA. This was mirrored as a facilitator: once clients were stable providers were then able to consider PA promotion. In two qualitative studies, clinicians discussed their commitment to a holistic approach to treatment which encompassed consideration of physical health needs.

**9. Goals:** mental representations of outcomes or end states that an individual wants to achieve

No barriers were identified within this domain. A commitment to a holistic approach, with a PA focus, was coded as a facilitator in this domain.

**10. Memory, Attention and Decision Processes:** the ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives

As coded above to the Intentions domain, a key barrier across six qualitative studies was the treatment of MI symptoms before encouraging PA. In acute, inpatient settings, providers are trained to make decisions to prioritize the immediate critical needs and safety of the client. As identified as a facilitator in one qualitative study, only when a client is considered stable, can PA promotion be a

**Table 3**  
Facilitators to physical activity and exercise promotion.

TDF Domain	Facilitators (Quantitative)	Facilitators (Qualitative)
Knowledge	<p><b>Knowledge of therapeutic potential of PA for treatment of MI</b>            8/20 (Stanton et al., 2015b)            29/51 (Phongsavan et al., 2007)            46/61 as standalone treatment (Stanton, 2013)            58/61 as adjunct treatment (Stanton, 2013)</p> <p><b>Knowledge to prescribe PA</b>            60/144 (Radovic et al., 2018)            47/81 (Stanton et al., 2017)            144/151 (Bartlem et al., 2016)</p> <p><b>Previous PA education/training<sup>a</sup></b>            29/232 (Burks &amp; Keeley, 1989)            48/48 (Brand et al., 2016)            90/236 during clinical education (Burton et al., 2010)            41/236 ongoing professional development (Burton et al., 2010)</p> <p><b>Previous MI education/training<sup>a</sup></b>            23/61 (Stanton, 2013)</p> <p><b>Awareness of general PA recommendations</b>            52/126 (Radovic et al., 2018)</p>	<p><b>Knowledge of therapeutic potential of PA for treatment of MI (Searle et al., 2012)</b></p> <p><b>Knowledge to promote PA (Happell et al., 2013b)</b></p>
Skills	<p><b>Competence and skills to prescribe PA<sup>a</sup></b>            9/20 (Stanton et al., 2015b)            47/61 (Stanton, 2013)            144/151 (Bartlem et al., 2016)</p> <p><b>Previous PA education/training<sup>a</sup></b>            29/232 (Burks &amp; Keeley, 1989)            48/48 (Brand et al., 2016)            90/236 during clinical education (Burton et al., 2010)            41/236 ongoing professional development (Burton et al., 2010)</p> <p><b>Previous MI education/training<sup>a</sup></b>            23/61 (Stanton, 2013)</p> <p><b>Have personal experience with PA</b>            48/48 (Brand et al., 2016)</p>	<p><b>Skills to promote PA (Happell et al., 2013b)</b></p>
Social/Professional Role and Identity	<p><b>Physically active themselves</b>            130/232 (Burks &amp; Keeley, 1989)</p>	<p><b>Key role in PA promotion/delivery (favourable, appropriate, legitimate) (Faulkner &amp; Biddle, 2002; Searle et al., 2012; Stubbs et al., 2014a; Stubbs et al., 2014b; Verhaeghe et al., 2013)</b></p>
Beliefs about Capabilities	<p><b>Confident to prescribe PA/exercise</b>            68/145 (Radovic et al., 2018)            9/20 (Stanton et al., 2015b)            150/236 (Burton et al., 2010)            52/61 (Stanton, 2013)            51/81 (Stanton et al., 2017)            148/151 (Bartlem et al., 2016)</p> <p><b>Competence and skills to prescribe PA<sup>a</sup></b>            9/20 (Stanton et al., 2015b)            47/61 (Stanton, 2013)            144/151 (Bartlem et al., 2016)</p>	<p><i>None identified</i></p>
Optimism	<p><b>Believe clients will change<sup>a</sup></b>            137/151 (Bartlem et al., 2016)</p>	<p><b>Optimistic about benefits of PA for MI treatment (Faulkner &amp; Biddle, 2002)</b></p>

(continued on next page)

**Table 3** (continued)

TDF Domain	Facilitators (Quantitative)	Facilitators (Qualitative)
Beliefs about Consequences	<p><b>Beneficial to clients:</b></p> <ol style="list-style-type: none"> <li><b>Treating MI symptoms</b> <ul style="list-style-type: none"> <li>- <b>Depression</b> 61/232 (Burks &amp; Keeley, 1989) 16/20 (Stanton et al., 2015b) 48/48 (Brand et al., 2016)</li> <li>- <b>Anxiety or tension</b> 47/232 (Burks &amp; Keeley, 1989)</li> </ul> </li> <li><b>Improving physical health/fitness</b> 48/48 (Brand et al., 2016) 19/20 fitness (Stanton et al., 2015b) 18/20 CVD risk (Stanton et al., 2015b)</li> <li><b>Reduced medication needs</b> 14/20 (Stanton et al., 2015b)</li> <li><b>Distraction</b> 19/20 (Stanton et al., 2015b)</li> </ol> <p><b>PA is an appropriate treatment method</b> 144/236 counselling (Burton et al., 2010) 194/236 advice (Burton et al., 2010) 46/61 as standalone treatment (Stanton, 2013) 58/61 as adjunct treatment (Stanton, 2013) 18/125 (Radovic et al., 2018) 18/20 (Stanton et al., 2015b)</p> <p><b>Clients would find it acceptable</b> 149/236 advice (Burton et al., 2010) 129/236 counselling (Burton et al., 2010)</p> <p><b>Believe clients will change<sup>a</sup></b> 137/151 (Bartlem et al., 2016)</p>	<p><b>Beneficial to clients:</b></p> <ol style="list-style-type: none"> <li><b>Treating MI symptoms</b> <ul style="list-style-type: none"> <li>- <b>Schizophrenia</b> (Carlbo et al., 2018)</li> </ul> </li> <li><b>Biochemical</b> (Searle et al., 2012)</li> <li><b>General well-being and quality of life</b> (Searle et al., 2012; Stubbs et al., 2014b)</li> <li><b>Social interaction</b> (Browne et al., 2016; Faulkner &amp; Biddle, 2002; Searle et al., 2012; Stubbs et al., 2014b; Verhaeghe et al., 2013)</li> <li><b>Structure</b> (Searle et al., 2012)</li> <li><b>Distraction/normalizing effect</b> (Faulkner &amp; Biddle, 2002; Kinnafick et al., 2018; Verhaeghe et al., 2013)</li> <li><b>Positive influence on mental health</b> (Kinnafick et al., 2018; Stubbs et al., 2014a; Stubbs et al., 2014b; Verhaeghe et al., 2013)</li> <li><b>Beneficial for general/physical health</b> (Carlbo et al., 2018; Faulkner &amp; Biddle, 2002; Happell et al., 2012; Kinnafick et al., 2018; Patel et al., 2018; Stubbs et al., 2014b; Verhaeghe et al., 2013)</li> <li><b>Reduce medication needs</b> (Patel et al., 2018)</li> <li><b>Body awareness/body image benefits</b> (Stubbs et al., 2014b)</li> </ol> <p><b>PA is an appropriate treatment method</b> (Searle et al., 2012)</p>
Reinforcement	<p><b>Clients reporting positive benefits<sup>a</sup></b> 17/20 (Stanton et al., 2015b)</p>	<p><i>None identified</i></p>
Intentions	<p><b>Motivated to promote/lead PA/exercise</b> 38/48 (Brand et al., 2016)</p>	<p><b>Stability on other domains of care<sup>a</sup></b> (Carlbo et al., 2018; Verhaeghe et al., 2013) <b>Commitment to a holistic approach (with a PA focus)<sup>a</sup></b> (Happell et al., 2013b; Kinnafick et al., 2018)</p>
Goals	<p><i>None identified</i></p>	<p><b>Commitment to a holistic approach (with a PA focus)<sup>a</sup></b> (Happell et al., 2013b; Kinnafick et al., 2018)</p>
Memory, Attention, Decision Process	<p><i>None identified</i></p>	<p><b>Client preferences for alternatives to medication<sup>a</sup></b> (Searle et al., 2012) <b>Stability on other domains of care<sup>a</sup></b> (Carlbo et al., 2018; Verhaeghe et al., 2013) <b>Rely on intuition</b> (Carlbo et al., 2018)</p>
Environmental Context & Resources	<p><b>Integrated into institutional operation</b> 48/48 (Brand et al., 2016)</p> <p><b>Previous PA education/training<sup>a</sup></b> 29/232 (Burks &amp; Keeley, 1989) 48/48 (Brand et al., 2016) 90/236 during clinical education (Burton et al., 2010) 41/236 ongoing professional development (Burton et al., 2010) 23/61 (Stanton, 2013)</p> <p><b>Well-equipped infrastructure</b> 5/48 (Brand et al., 2016)</p> <p><b>Services to refer clients for PA</b> 121/151 (Bartlem et al., 2016)</p>	<p><b>Integrated into institutional operation</b> (Carlbo et al., 2018; Leutwyler et al., 2012)</p> <p><b>Access to incentives to provide to clients</b> (Browne et al., 2016; Soundy et al., 2014) <b>Access to resources (e.g., information, programs)</b> (Happell et al., 2013b)</p>
Social Influences	<p><b>Experience/advice/support of other practitioners</b> 40/48 peer (Brand et al., 2016) 30/48 organizational (Brand et al., 2016)</p> <p><b>Clients reporting positive benefits<sup>a</sup></b> 17/20 (Stanton et al., 2015b)</p> <p><b>Clients are receptive to PA advice</b> 149/236 advice (Burton et al., 2010) 129/236 counselling (Burton et al., 2010)</p>	<p><b>Support from colleagues from other professions/settings</b> (Carlbo et al., 2018; Happell et al., 2012; Happell et al., 2013b)</p> <p><b>Client preferences for alternatives to medication<sup>a</sup></b> (Searle et al., 2012)</p>
Emotion	<p><i>None identified</i></p>	<p><i>None identified</i></p>
Behavioural Regulation	<p><i>None identified</i></p>	<p><i>None identified</i></p>

PAEP = Physical activity & exercise programs MI = Mental illness CVD = cardiovascular disease.

<sup>a</sup> Coded to multiple domains.

focus. Another facilitator identified was client preference for alternative options to medication, which reduced the treatment options for the provider to choose from. In one qualitative study, nurses discussed relying on intuition when it comes to promoting PA to clients with schizophrenia.

11. **Environmental Context and Resources:** any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour

ECR was the second most prominent TDF domain. As noted above, a lack of PA training was identified as a predominant barrier to PA promotion/prescription, whereas previous PA education/training was reported as an important facilitator (although the majority of providers reported not having prior training). Lack of time due to excessive workload, high demands of everyday practice and unpredictable occurrences of crisis, were identified by a variety of providers as barriers across both quantitative and qualitative studies. However, the majority of providers in the quantitative studies did not agree that lack of time was a barrier. Participants also reported a lack of resources, including access to equipment, shortages in funding and staff, and a lack of organizational support. Relatedly, a lack of consistent programming was identified as a barrier in qualitative studies. Facilitators included the integration of PA into the operations of the facility/clinic and access to incentives (e.g., monetary rewards) and other resources (information, programs) to provide to clients to reinforce their PA participation.

12. **Social influences:** interpersonal processes that can cause individuals to change their thoughts, feelings or behaviours

The most prevalent barriers coded in this domain were the clients' own barriers to PA engagement (see Beliefs about consequences). In two quantitative studies, some clinicians felt that clients did not want mental health professionals to provide PA counselling. Other barriers that emerged from the qualitative literature were the lack of support from others and the stigma about MI. This was not always the case as clinicians in three qualitative studies felt that they were supported and in harmony with what their colleagues from other professions and settings were doing for PA promotion. Specific interactions with clients that supported providers' PA promotion behaviour included clients' receptivity to PA advice, preference for alternatives to medication for treatment options, and expressing the benefits of PA engagement.

13. **Emotion:** a complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event

No facilitators were categorized to this domain. Clinicians reported fear and concern over the physical health risk of clients participating in exercise, appearing to be hypocritical for promoting a behaviour they do not engage in themselves, and some viewed prescribing exercise to disinterested participants as a violation of human rights.

14. **Behavioural Regulation:** anything aimed at managing or changing objectively observed or measured actions

No barriers or facilitators were identified within this domain.

#### 4. Discussion

The purpose of this study was to identify the barriers and facilitators to PA promotion experienced by health care providers working with individuals with MI. Overall, barriers and/or facilitators were identified in all TDF domains except 'Behavioural Regulation'. Importantly, this review highlights two key TDF domains that should be targeted to assist health care providers' promotion of PA to individuals with MI: 'Beliefs

about the Consequences', and 'Environmental Context & Resources (ECR)'. A comprehensive and theoretical examination of these factors allows researchers to prioritize and develop evidence-based strategies to support implementation of clinical guidelines related to exercise into practice.

The most predominant TDF domain for both barriers and facilitators to PA promotion was 'Beliefs about Consequences'. An important barrier identified by health care providers was the barriers faced by clients (also coded to 'Social Influences'). Individuals with mental illness experience numerous barriers to PA engagement related to their illness and unique from the general population (e.g., low mood, psychiatric symptoms) (Firth et al., 2016; Glowacki et al., 2017; Vancampfort et al., 2015b). This possibly relates to the pessimistic belief that clients will not adhere if the practitioner promotes PA. Avery and Patterson (2018) describe this belief that nothing can be done as therapeutic nihilism, and this affects health care providers' motivation to promote PA. However, the presence of client barriers, coupled with therapeutic nihilism, should not be an excuse to forgo the promotion of PA. Providers have a duty to care and to help individuals with mental illness overcome barriers to engaging in meaningful occupations and treatments such as exercise. Behaviour change is of course challenging yet systematic reviews demonstrate intervention is possible (Bridle, Spaniers, Patel, Atherton, & Lamb, 2012; Dauwan, Begemann, Heringa, & Sommer, 2016; Josefsson, et al., 2014) and qualitative research undoubtedly tells us that clients want support in leading healthier lives (Azaar, Ball, Salmon, & Cleland, 2010; Searle et al., 2014; Wright, Armstrong, Taylor, & Dean, 2011). With the evolving integration of exercise and PA into treatment guidelines for MI, there may be an opportunity for developing training opportunities that challenge pessimistic assumptions and equip practitioners with strategies and skills to help their clients overcome barriers to increasing PA.

Another important domain identified in this review was 'ECR'. A common clinician barrier was a lack of training on how to promote PA (closely related to lack of knowledge and skills). Similarly, primary care providers identified a lack of knowledge and training in PA as their top barriers when working with the general population (Hébert et al., 2012; Huijg et al., 2015). In contrast, health care providers in this review and others (Crisford et al., 2018; Huijg et al., 2015) identified that training to enhance knowledge and skills was an important factor to engaging in PA promotion. Other barriers within 'ECR' include a lack of resources such as programs and staff. These findings align with a recent international consensus about the integration of PA in mental health services that identified that resource and organizational culture changes are needed for successful integration (Rosenbaum et al., 2018). Changes to organizational culture include a change in infrastructure around programming and staff, as well as training for either mental health professionals on exercise/PA or for exercise specialists on MI. For exercise as a treatment for MI to gain wider acceptance there remains the need for formalized organizational and structural support, targeted funding, ongoing education and training of commissioners and providers of mental health services and practitioners, and the development of evidence-based exercise and PA programs. Accordingly, future research examining the integration of PA into mental health care should focus on the systems of care rather than only at the individual level.

This review included studies that examined barriers and facilitators to PA promotion by a variety of health care providers to a variety of clinical MI subpopulations. It is important to consider if and how these different groups and/or contexts may require a targeted intervention approach to overcome population or context specific barriers. While only three articles examined clinicians working with clients of a specific age group, adolescents and older adults (Radovic et al., 2018; Leutwyler et al., 2012; Zanetidou et al., 2017), no differences in barriers and facilitators were identified between these groups.

Health care providers working with individuals with depression are an important clinical subpopulation, as all current clinical treatment guidelines centre on adults with depression (APA, 2010; NICE, 2009;

Ravindran et al., 2016). Seven studies included in this review examined practitioners that specifically work with individuals with depression (Brand et al., 2016; Burks & Keeley, 1989; Patel et al., 2011; Radovic et al., 2018; Searle et al., 2012; Stanton et al., 2015a; Zanetidou et al., 2017). Overall, no discernible differences were found for these providers in relation to their main barriers and facilitators to PA promotion compared to the rest of the studies in this review. Thus, the overall results from this review can be used to inform intervention for this subpopulation of health care providers.

Health care providers that work with individuals with schizophrenia are another important subpopulation, as schizophrenia is a chronic and severe mental disorder that is typically chronic and disabling (National Institute of Mental Health, 2016). Five studies included in this review focused on providers who work specifically with individuals with schizophrenia (Carlbo et al., 2018; Leutwyler et al., 2012; Soundy et al., 2014; Stubbs et al., 2014a; Stubbs et al., 2014b), and four further studies included providers that work with individuals with serious mental illness, inclusive of schizophrenia (Browne et al., 2016; Harding, 2013; Kinnafick et al., 2018; Robson et al., 2013). A unique facilitator influencing behaviour in these studies was the use of incentives (e.g., discount to fitness facilities) to help promote PA. Incentivizing can promote behaviour on two levels: for the client, by reducing barriers related to resources (e.g., limited finances), and for the provider, by acting as a resource and a tool by which to discuss and promote PA with a client. It is likely that incentives would work in the same way for clinicians that work with other MI populations, as individuals with MI are likely to experience lower income and higher rates of unemployment (Mental Health Commission of Canada, 2017).

In this review another emerging subpopulation of providers was exercise specialists. Three studies examined specialist mental health physiotherapists (Soundy et al., 2014; Stubbs et al., 2014a; Stubbs et al., 2014b), and two included exercise physiologists (Stanton, 2013; Stanton et al., 2017). It is important to note that not all mental health care systems have exercise specialists embedded within the multidisciplinary mental health team. For example, in Canada no coordinated national or provincial referral scheme exists for individuals diagnosed with a mental illness to seek mental health treatment from an exercise specialist. The studies that included exercise physiologists were both conducted in Australia, where mental health components are incorporated into the professionals' graduate training (Stanton et al., 2017), and individuals with MI can receive referrals to see accredited exercise physiologists (Lederman et al., 2016). Better integration of exercise specialists into the mental health system could alleviate the need to train mental health providers on the specifics of PA promotion or prescription. For this to happen advocacy to key stakeholders such as government health authorities, decision makers, and community organizations still remains necessary.

#### 4.1. Implications

From this review, key theoretical domains in the TDF can be mapped onto intervention functions and behaviour change techniques (BCTs) via the Behaviour Change Wheel to support intervention design and delivery (Cane, Richardson, Johnston, Ladha, & Michie, 2015; Michie, Atkins & West, 2013). For example, a recommended BCT that can be used for intervention is educating providers with *information on the health consequences* (to their client) of promoting PA and on the clinical guidelines supporting this evidence to address providers' lack of knowledge on the evidence-base for PA in the treatment of MI. Mental health care providers identified a need for training on PA promotion. Training could provide the opportunity for clinicians to engage in *behavioural rehearsal/practice* (e.g., role play), which is practicing the performance of a behaviour multiple times in a context when the behaviour is not necessary to increase habit & skill (Michie et al., 2013b).

While policy- and organizational-level changes are warranted (Rosenbaum et al., 2018), these changes require considerable time and

funding. Providing training to health care providers on skills, knowledge, the positive benefits of PA for individuals with MI, and clinical guidelines may be a feasible and acceptable starting point to a complex problem (Avery & Patterson, 2018). Training, complementary with recovery-oriented principles (Davidson, Shmutte, Dinzeo, & Andres-Hyman, 2009), can equip clinicians with tools and behaviour change techniques to help clients overcome barriers to PA. Training could be delivered to health care providers in a variety of ways, including in-person or online modules, and at a variety of times throughout their professional career (at the outset and ongoing). In order for shifts in organizational culture to occur sustainably over time, mental health professional training should incorporate PA-specific content into curriculum to prepare health care providers before entering their practice (Faulkner & Biddle, 2001). The emergence of initiatives such as 'Exercise is Medicine' (<http://exerciseismedicine.org/>) may provide some momentum to such considerations.

#### 4.2. Strengths and limitations

A significant strength of this paper was the use of a theoretical framework to conduct a behavioural analysis to systematically understand the factors influencing behaviour of health care providers that work with individuals with MI. This analysis can assist with the creation of future interventions to support the PA promotion by health care professionals. Other interventionists can replicate this analytical approach for any specific population/behaviour. While some clinical guidelines specify exercise for mental illness (not PA per se), exercise is a subset of physical activity and we made no separation of these terms in this review. As this was a scoping review, no quality assessment of included articles was performed. An additional strength of this review is that it evaluated qualitative and quantitative studies. We did not have access to the raw data from the included studies, and had to rely on the reporting of barriers and facilitators by original authors for extraction and coding. Determining the factors directly affecting the health care providers' behaviour was difficult as this behaviour is multi-layered and affected by client behaviour. This made it difficult at times to determine if a barrier or facilitator was mentioned in relation to the behaviour of providers' promotion of PA, or in relation to their clients' behaviour of engaging in PA. Finally, it is possible that there are factors representative of other TDF domains (e.g., Goals, Behavioural Regulations) that may hinder or support PA promotion by health care professionals, yet we were limited to extracting and coding data that the original authors identified.

#### 5. Conclusion

This review provides insight into the barriers and facilitators that health care providers experience when promoting PA to individuals with mental illness. The most prominent barriers and facilitators were encompassed within the domains of 'Beliefs about the Consequences', and 'Environmental Context & Resources'. To address these important domains and help clinicians promote PA, specialized training is vital and should incorporate recommended BCTs in a relevant way (Cane et al., 2015). Training should provide education on the evidence base, and teach health care providers the skills to employ evidence-based behaviour change techniques to help their clients overcome barriers to PA. Training could be implemented at a curriculum level to mental health care provider trainees before entering the field as a professional to ensure culture changes around the use of PA for MI, or for exercise specialists in working with individuals with MI. However, greater integration of PA promotion within mental health care will require broader systemic change.

#### Potential conflicts of interest

None to declare.

**Source of funding and Acknowledgements**

This study was supported by a Canadian Institutes of Health Research (CIHR) Foundation grant (CIHR FDN-154289) awarded to

Guy Faulkner. Guy Faulkner is also supported by CIHR-Public Health Agency of Canada (PHAC) Chair in Applied Health Research. We would like to thank Sheryl Adams (University of British Columbia) for her assistance in developing and executing the literature search strategy.

**Appendix 1**

PRISMA-Scr Checklist.

Section	Item	PRISMA-Scr Checklist Item	Page
<b>Title</b>	1	Identify the report as a scoping review.	Title page
<b>Abstract</b>			
Structured summary	2	Provide a structured summary that includes (as applicable) background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	Abstract
<b>Introduction</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions or objectives lend themselves to a scoping review approach.	1–2
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (for example, population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions or objectives.	2
<b>Methods</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (for example, a Web address); and if available, provide registration information, including the registration number.	2
Eligibility Criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (for example, years considered, language, and publication status), and provide a rationale.	2–3
Information Sources*	7	Describe all information sources in the search (for example, databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	3
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Appendix 2
Selection of sources of evidence	9	State the process for selecting sources of evidence (that is, screening and eligibility) included in the scoping review.	2–3
Data charting process	10	Describe the methods of charting data from the included sources of evidence (for example, calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	3
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	3
Critical appraisal of individual sources of evidence	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	n/a
Summary measures	13	This item from the original PRISMA is not applicable for scoping reviews because a meta-analysis is not done (that is, summary measures are not relevant).	n/a
Synthesis of results	14	Describe the methods of handling and summarizing the data that were charted.	3
Risk of bias	15	This item from the original PRISMA is not applicable for scoping reviews because the scoping review method is not intended to be used to critically appraise (or appraise the risk of bias of) a cumulative body of evidence.	n/a
Additional analyses	16	This item from the original PRISMA is not applicable for scoping reviews because additional analyses, including sensitivity or subgroup analyses and meta-regression, are not done.	n/a
<b>Results</b>			
Selection of sources of evidence	17	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Fig. 1, p. 3
Characteristics of sources of evidence	18	For each source of evidence, present characteristics for which data were charted and provide the citations.	Table 1, p. 3–4
Critical appraisal within sources of evidence	19	If done, present data on critical appraisal of included sources of evidence (see item 12).	n/a
Results of individual sources of evidence	20	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Tables 2 and 3
Synthesis of results	21	Summarize or present the charting results as they relate to the review questions and objectives.	p. 4–13
Risk of bias across studies	22	This item is not applicable for scoping reviews. See explanation for item 15.	n/a
Additional analyses	23	This item is not applicable for scoping reviews. See explanation for item 16.	n/a
<b>Discussion</b>			
Summary of evidence	24	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	13–14
Limitations	25	Discuss the limitations of the scoping review process.	14
Conclusions	26	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications or next steps.	14
<b>Funding</b>	27	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	14–15

**Appendix 2**

PsycINFO search strategy.

Date	Search ID #	Terms	Postings
Sept 6, 2018	S1	DE "Mental Disorders" OR DE "Adjustment Disorders" OR DE "Affective Disorders" OR DE "Alexithymia" OR DE "Anxiety Disorders" OR DE "Autism Spectrum Disorders" OR DE "Chronic Mental Illness" OR DE "Dementia" OR DE "Dissociative Disorders" OR DE "Eating Disorders" OR DE "Elective Mutism" OR DE "Factitious Disorders" OR DE "Gender Identity Disorder" OR DE "Hoarding Disorder" OR DE "Hysteria" OR DE "Impulse Control Disorders" OR DE "Koro" OR DE "Mental Disorders due to General Medical Conditions" OR DE "Neurosis" OR DE "Paraphilias" OR DE "Personality Disorders" OR DE "Pseudodementia" OR DE "Psychosis" OR DE "Schizoaffective Disorder" OR DE "Affective Disorders" OR	382,929

	DE "Bipolar Disorder" OR DE "Disruptive Mood Dysregulation Disorder" OR DE "Major Depression" OR DE "Mania" OR DE "Seasonal Affective Disorder"	
S2	DE "Exercise" OR DE "Aerobic Exercise" OR DE "Weightlifting" OR DE "Yoga" OR DE "Physical Activity" OR DE "Actigraphy" OR DE "Exercise" OR DE "Health Promotion" OR "Physical Health"	69,493
S3	DE "Health Personnel Attitudes" OR DE "Therapist Attitudes" OR DE "Mental Health Personnel"	29,448
S4	S1 AND S2 AND S3	54
S5	S2 AND S3	441
S6	TX mental OR schizo* OR psychiatric OR mood OR psychosis OR affective OR anxiety OR depression OR bipolar	1,301,873
S7	TX exerc* OR "physical activ*"	100,215
S8	TX practitioner OR nurs* OR physician OR therap* OR professional OR staff OR clinician	1,396,833
S9	TX health OR healthcare OR health care OR "mental health services"	1,183,216
S10	TX promot* OR prevent* OR prescri* OR counsel* OR refer*	849,408
S11	TX barrier* OR perception* OR perspective* OR attitude* OR belie* OR "Influen* factor*" OR view*	1,402,318
S12	S6 AND S7 AND S8 AND S9 AND S10 AND S11	2262
S13	S5 OR 12	2676

## References

American College of Sports Medicine (2018). *Exercise is medicine: A global health initiative*. Available online: <http://exercisemedicine.org/>.

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32.

Avery, N., & Patterson, S. (2018). Physical health in public mental health care: A qualitative study employing the COM-B model of behaviour to describe views and practices of Australian psychologists. *Australian Psychologist*, 53(4), 302–312.

Aylett, E., Small, N., & Bower, P. (2018). Exercise in the treatment of clinical anxiety in general practice—a systematic review and meta-analysis. *BMC Health Services Research*, 18(1), 559.

Azaar, D., Ball, K., Salmon, J., & Cleland, V. J. (2010). Physical activity correlates in young women with depressive symptoms: A qualitative study. *International Journal of Behavioral Nutrition and Physical Activity*, 7(3).

\*Bartlem, K., Bowman, J., Ross, K., Freund, M., Wye, P., McElwaine, K., ... Wiggers, J. (2016). Mental health clinician attitudes to the provision of preventive care for chronic disease risk behaviours and association with care provision. *BMC Psychiatry*, 16(1), 57.

\*Brand, S., Colledge, F., Beeler, N., Phse, U., Kalak, N., Bahmani, D. S., ... Gerber, M. (2016). The current state of physical activity and exercise programs in German-speaking, Swiss psychiatric hospitals: Results from a brief online survey. *NDT*, 12, 1309–1317.

\*Bressington, D., Badnapurkar, A., Inoue, S., Ma, H. Y., Chien, W. T., Nelson, D., et al. (2018). Physical health care for people with severe mental illness: The attitudes, practices, and training needs of nurses in three Asian countries. *International Journal of Environmental Research and Public Health*, 15(2), 343.

\*Bressington, D., Mui, J., Wells, H., Chien, W. T., Lam, C., White, J., et al. (2016). Refocusing on physical health: Community psychiatric nurses' perceptions of using enhanced health checks for people with severe mental illness. *International Journal of Mental Health Nursing*, 25(3), 214–224.

Bridle, C., Spanjers, K., Patel, S., Atherton, N., & Lamb, S. (2012). Effect of exercise on depression severity in older people: systematic review and meta-analysis of randomised controlled trials. *British Journal of Psychiatry*, 201(3), 180–185.

\*Browne, J., Mihas, P., & Penn, D. L. (2016). Focus on exercise: Client and clinician perspectives on exercise in individuals with serious mental illness. *Community Mental Health Journal*, 52(4), 387–394.

\*Burks, R. J., & Keeley, S. M. (1989). Exercise and diet therapy: Psychotherapists' beliefs and practices. *Professional Psychology: Research and Practice*, 20(1), 62.

\*Burton, N. W., Pakenham, K. I., & Brown, W. J. (2010). Are psychologists willing and able to promote physical activity as part of psychological treatment? *International Journal of Behavioral Medicine*, 17(4), 287–297.

Cane, J., O'Connor, D., & Michie, S. (2012). Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science*, 7(1), 37.

Cane, J., Richardson, M., Johnston, M., Ladha, R., & Michie, S. (2015). From lists of behaviour change techniques (BCTs) to structured hierarchies: Comparison of two methods of developing a hierarchy of BCTs. *British Journal of Health Psychology*, 20, 130–150.

\*Carlbo, A., Claesson, H. P., & Åström, S. (2018). Nurses' experiences in using physical activity as complementary treatment in patients with schizophrenia. *Issues in Mental Health Nursing*, 39(7), 600–607.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100(2), 126.

Chesney, E., Goodwin, G. M., & Fazel, S. (2014). Risks of all-cause and suicide mortality in mental disorders: A meta-review. *World Psychiatry*, 13, 153–160.

Crisford, P., Winzenberg, T., Venn, A., Schultz, M., Aitken, D., & Cleland, V. (2018). Factors associated with physical activity promotion by allied and other non-medical health professionals: A systematic review. *Patient Education and Counseling*. <https://doi.org/10.1016/j.pec.2018.05.011>.

Dauwan, M., Begemann, M. J. H., Heringa, S. M., & Sommer, I. E. (2016). Exercise improves clinical symptoms, quality of life, global functioning, and depression in schizophrenia: A systematic review and meta-analysis. *Schizophrenia Bulletin*, 42(3), 588–599.

Davidson, L., Drake, R. E., Schmutte, T., Dinzeo, T., & Andres-Hyman, R. (2009). Oil and water or oil and vinegar? Evidence-based medicine meets recovery. *Community Mental Health Journal*, 45(5), 323–332.

Deslandes, A., Moraes, H., Ferreira, C., Veiga, H., Silveira, H., Mouta, R., ... Laks, J. (2009). Exercise and mental health: Many reasons to move. *Neuropsychobiology*, 59(4), 191–198.

Dobson, F., Bennell, K. L., French, S. D., Nicolson, P. J. A., Klaasman, R. N., Holden, M. A., et al. (2016). Barriers and facilitators to exercise participation in people with hip and/or knee osteoarthritis: Synthesis of the literature using behaviour change theory. *American Journal of Physical Medicine & Rehabilitation*, 95, 372–389.

Faulkner, G., & Biddle, S. (2001). Exercise and mental health: It's just not psychology!. *Journal of Sports Sciences*, 19(6), 433–444.

\*Faulkner, G., & Biddle, S. (2002). Mental health nursing and the promotion of physical activity. *Journal of Psychiatric and Mental Health Nursing*, 9(6), 659–665.

Firth, J., Cotter, J., Elliott, R., French, P., & Yung, A. R. (2015). A systematic review and meta-analysis of exercise interventions in schizophrenia patients. *Psychological Medicine*, 45(7), 1343–1361.

Firth, J., Rosenbaum, S., Stubbs, B., Gorcezynski, P., Yung, A. R., & Vancampfort, D. (2016). Motivating factors and barriers towards exercise in severe mental illness: A systematic review and meta-analysis. *Psychological Medicine*, 46, 2869–2881.

\*Ganiyah, A. N., Al-Hussami, M., & Alhadidi, M. M. (2017). Mental health nurses attitudes and practice toward physical health care in Jordan. *Community Mental Health Journal*, 53(6), 725–735.

Glowacki, K., Duncan, M., Gainforth, H., & Faulkner, G. (2017). Barriers and facilitators to physical activity and exercise among adults with depression: A scoping review. *Mental Health and Physical Activity*, 13, 108–119.

\*Happell, B., Platania-Phung, C., & Scott, D. (2013a). Physical health care for people with mental illness: Training needs for nurses. *Nurse Education Today*, 33(4), 396–401.

\*Happell, B., Scott, D., & Platania-Phung, C. (2013b). Survey of Australian mental health nurses on physical activity promotion. *International Journal of Mental Health Promotion*, 15(3), 148–161.

\*Happell, B., Scott, D., Platania-Phung, C., & Nankivell, J. (2012). Nurses' views on physical activity for people with serious mental illness. *Mental Health and Physical Activity*, 5(1), 4–12.

Happell, B., Scott, D., Platania-Phung, C., & Nankivell, J. (2013c). Communication with colleagues: Frequency of collaboration regarding physical health of consumers with mental illness. *Perspectives in Psychiatric Care*, 50, 33–43.

\*Harding, S. L. (2013). Direct care staff perspectives related to physical activity in mental health group homes. *Journal of Psychosocial Nursing and Mental Health Services*, 51(12), 38–43.

Hébert, E. T., Caughey, M. O., & Shuval, K. (2012). Primary care providers' perceptions of physical activity counselling in a clinical setting: A systematic review. *British Journal of Sports Medicine*, 46(9), 625–631.

Heslehurst, N., Newham, J., Maniopoulos, G., Fleetwood, C., Robalino, S., & Rankin, J. (2014). Implementation of pregnancy weight management and obesity guidelines: A meta-synthesis of health care professionals' barriers and facilitators using the theoretical domains framework. *Obesity Reviews*, 15, 462–486.

Huijg, J. M., Gebhardt, W. A., Verheijden, M. W., van der Zouwe, N., de Vries, J. D., Middelkoop, B. J., et al. (2015). Factors influencing primary health care professionals' physical activity promotion behaviors: A systematic review. *International Journal of Behavioral Medicine*, 22(1), 32–50.

Hyndman, B. (2007). *Towards the development of competencies for health promoters in Canada: A discussion paper. Health promotion Canada*. Available online: [https://www.healthpromotioncanada.ca/wp-content/uploads/2016/07/HP\\_competenciespaper\\_Apr\\_07.pdf](https://www.healthpromotioncanada.ca/wp-content/uploads/2016/07/HP_competenciespaper_Apr_07.pdf).

Josefsson, T., Lindwall, M., & Archer, T. (2014). Physical exercise intervention in depressive disorders: Meta-analysis and systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 24, 259–272.

\*Joyce, C. L., & O'Tuathaigh, C. M. (2014). Increased training of general practitioners in Ireland may increase the frequency of exercise counselling in patients with chronic illness: A cross-sectional study. *The European Journal of General Practice*, 20(4), 314–319.

\*Kinnafick, F. E., Papatthomas, A., & Regoczi, D. (2018). Promoting exercise behaviour in a secure mental health setting: Health care assistant perspectives. *International Journal of Mental Health Nursing*, 101(10), 1775–1785.

Krogh, J., Hjorthøj, C., Speyer, H., Gluud, C., & Nordentoft, M. (2017). Exercise for

- patients with major depression: A systematic review with meta-analysis and trial sequential analysis. *British Medical Journal open*, 7(9), e014820.
- Lederman, O., Grainger, K., Stanton, R., Douglas, A., Gould, K., Perram, A., ... Hewavamsam, J. (2016). Consensus statement on the role of accredited exercise physiologists within the treatment of mental disorders: A guide for mental health professionals. *Australasian Psychiatry*, 24(4), 347–351.
- \*Leutwyler, H., Hubbard, E. M., Jeste, D. V., & Vinogradov, S. (2012). “We’re not just sitting on the periphery”: A staff perspective of physical activity in older adults with schizophrenia. *The Gerontologist*, 53(3), 474–483.
- Levac, D., Colquhoun, H., & O’Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5(1), 69.
- Mental Health Commission of Canada (2017). Strengthening the case for investing in Canada’s mental health system: Economic considerations. Retrieved from [https://www.mentalhealthcommission.ca/sites/default/files/2017-03/case\\_for\\_investment\\_eng.pdf](https://www.mentalhealthcommission.ca/sites/default/files/2017-03/case_for_investment_eng.pdf).
- Michie, S., Atkins, L., & West, R. (2014). *The behaviour change wheel: A guide to designing interventions*. Great Britain, UK: Silverback Publishing.
- Michie, S., Johnston, M., Abraham, C., Lawton, R., Parker, D., Walker, A., et al. (2005). Making psychological theory useful for implementing evidence based practice: A consensus approach. *Quality and Safety in Health Care*, 14(1), 26–33.
- Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., ... Wood, C. E. (2013). The behaviour change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Annals of Behavioural Medicine*, 46(1), 81–95.
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097.
- National Collaborating Centre for Mental Health UK (2009). *Depression: The treatment and management of depression in adults* (updated edition). London, UK: National Institute for Health and Care Excellence.
- National Collaborating Centre for Mental Health UK (2014). *Psychosis and schizophrenia in adults: Treatment and management* (updated edition). London, UK: National Institute for Health and Care Excellence.
- National Institute of Mental Health (2016). Mental health information. Available online: <https://www.nimh.nih.gov/index.shtml>.
- \*Patel, A., Schofield, G. M., Kolt, G. S., & Keogh, J. W. (2011). General practitioners’ views and experiences of counselling for physical activity through the New Zealand Green Prescription program. *BMC Family Practice*, 12(1), 119.
- \*Phongsavan, P., Merom, D., Bauman, A., & Wagner, R. (2007). Mental illness and physical activity: Therapists’ beliefs and practices. *Australian and New Zealand Journal of Psychiatry*, 41(5), 458–459.
- \*Radovic, S., Melvin, G. A., & Gordon, M. S. (2018). Clinician perspectives and practices regarding the use of exercise in the treatment of adolescent depression. *Journal of Sports Sciences*, 36(12), 1371–1377.
- Ravindran, A. V., Balneaves, L. G., Faulkner, G., Ortiz, A., McIntosh, D., Morehouse, R. L., ... MacQueen, G. M. (2016). Canadian Network for mood and anxiety treatments (CANMAT) 2016 clinical guidelines for the management of adults with major depressive disorder: Section 5. Complementary and alternative medicine treatments. *Canadian Journal of Psychiatry*, 61(9), 576–587.
- Richardson, C. R., Faulkner, G., McDevitt, J., Skrinar, G. S., Hutchinson, D. S., & Piette, J. D. (2005). Integrating physical activity into mental health services for persons with serious mental illness. *Psychiatric Services*, 56(3), 324–331.
- \*Robson, D., Haddad, M., Gray, R., & Gourmay, K. (2013). Mental health nursing and physical health care: A cross-sectional study of nurses’ attitudes, practice, and perceived training needs for the physical health care of people with severe mental illness. *International Journal of Mental Health Nursing*, 22(5), 409–417.
- Rosenbaum, S., Hobson-Powell, A., Davison, K., Stanton, R., Craft, L. L., Duncan, M., ... Ward, P. B. (2018). The role of sport, exercise, and physical activity in closing the life expectancy gap for people with mental illness: An international consensus statement by exercise and sports science Australia, American College of sports medicine, British association of sport and exercise science, and sport and exercise science New Zealand. *Translational Journal of the American College of Sports Medicine*, 3(10), 72–73.
- Rosenbaum, S., Tiedemann, A., Sherrington, C., Curtis, J., & Ward, P. B. (2014). Physical activity interventions for people with mental illness: A systematic review and meta-analysis. *Journal of Clinical Psychiatry*, 75, 964–974.
- Schuch, F. B., Vancampfort, D., Richards, J., Rosenbaum, S., Ward, P. B., & Stubbs, B. (2016). Exercise as a treatment for depression: A meta-analysis adjusting for publication bias. *Journal of Psychiatric Research*, 77, 42–51.
- \*Searle, A., Calnan, M., Turner, K. M., Lawlor, D. A., Campbell, J., Chalder, M., et al. (2012). General practitioners beliefs about physical activity for managing depression in primary care. *Mental Health and Physical Activity*, 5(1), 13–19.
- Searle, A., Hass, M. A., Chalder, M., Fox, R. K., Taylor, H. A., Lews, G., et al. (2014). Participants’ experiences of facilitated physical activity for the management of depression in primary care. *Journal of Health Psychology*, 19(11) 1430–1422.
- \*Soundy, A., Stubbs, B., Probst, M., Hemmings, L., & Vancampfort, D. (2014). Barriers to and facilitators of physical activity among persons with schizophrenia: A survey of physical therapists. *Psychiatric Services*, 65(5), 693–696.
- \*Stanton, R. (2013). Accredited exercise physiologists and the treatment of people with mental illnesses. *Clinical Practice*, 2(2), 5–9.
- \*Stanton, R., Franck, C., Reaburn, P., & Happell, B. (2015a). A pilot study of the views of general practitioners regarding exercise for the treatment of depression. *Perspectives in Psychiatric Care*, 51(4), 253–259.
- \*Stanton, R., Happell, B., & Reaburn, P. (2015b). Investigating the exercise-prescription practices of nurses working in inpatient mental health settings. *International Journal of Mental Health Nursing*, 24(2), 112–120.
- Stanton, R., & Reaburn, P. (2013). Exercise and the treatment of depression: A review of the exercise program variables. *Journal of Science and Medicine in Sport*, 17(2), 117–182.
- \*Stanton, R., Rosenbaum, S., Lederman, O., & Happell, B. (2017). Implementation in action: How Australian exercise physiologists approach exercise prescription for people with mental illness. *Journal of Mental Health*, 27(2), 150–156.
- \*Stubbs, B., Soundy, A., Probst, M., De Hert, M., De Herdt, A., Parker, A., et al. (2014b). The assessment, benefits and delivery of physical activity in people with schizophrenia: A survey of members of the international organization of physical therapists in mental health. *Physiotherapy Research International: The Journal for Researchers and Clinicians in Physical Therapy*, 19(4), 248–256.
- \*Stubbs, B., Soundy, A., Probst, M., De Hert, M., De Herdt, A., & Vancampfort, D. (2014a). Understanding the role of physiotherapists in schizophrenia: An international perspective from members of the international organisation of physical therapists in mental health (IOPTMH). *Journal of Mental Health*, 23(3), 125–129.
- The Royal Australian and New Zealand College of Psychiatrists (2015). *Keeping body and mind together: Improving the physical health and life expectancy of people with serious mental illness*. Melbourne: The Royal Australian and New Zealand College of Psychiatrists.
- Thomson, D., Turner, A., Lauder, S., Gigler, M. E., Berk, L., Singh, A. B., ... Sylvia, L. (2015). A brief review of exercise, bipolar disorder, and mechanistic pathways. *Frontiers in Psychology*, 6, 147.
- Tricco, A. C., Lillie, E., Zarin, W., O’Brien, K. K., Colquhoun, H., Levac, D., ... Hempel, S. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*. <https://doi.org/10.7326/M18-0850>.
- Vancampfort, D., Stubbs, B., Mitchell, A. J., De Hert, M., Wampers, M., Ward, P. B., ... Correll, C. U. (2015a). Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: A systematic review and meta-analysis. *World Psychiatry*, 14(3), 339–347.
- Vancampfort, D., Stubbs, B., Ward, P. B., Teasdale, S., & Rosenbaum, S. (2015b). Integrating physical activity as medicine in the care of people with severe mental illness. *Australian and New Zealand Journal of Psychiatry*, 49(8), 681–682.
- Verhaeghe, N., De Maeseneer, J., Maes, L., Van Heeringen, C., & Annemans, L. (2011). Effectiveness and cost-effectiveness of lifestyle interventions on physical activity and eating habits in persons with severe mental disorders: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 8(1), 28.
- \*Verhaeghe, N., Maeseneer, J., Maes, L., Heeringen, C., & Annemans, L. (2013). Health promotion in mental health care: Perceptions from patients and mental health nurses. *Journal of Clinical Nursing*, 22(11–12), 1569–1578.
- \*Way, K., Kannis-Dyand, L., Lastella, M., & Lovell, G. P. (2018). Mental health practitioners’ reported barriers to prescription of exercise for mental health consumers. *Mental Health and Physical Activity*, 14, 52–60.
- Weatherston, K., Gainforth, H., & Jung, M. (2017). A theoretical analysis of the barriers and facilitators to the implementation of school based physical activity policies in Canada: A mixed methods scoping review. *Implementation Science*, 12(41), 1–15.
- \*Wendt, S. J. (2005). Smoking cessation and exercise promotion counseling in psychologists who practice psychotherapy. *American Journal of Health Promotion*, 19(5), 339–345.
- Wright, K., Armstrong, T., Taylor, A., & Dean, S. (2011). ‘It’s a double edged sword’: A qualitative analysis of the experiences of exercise amongst people with bipolar disorder. *Journal of Affective Disorders*, 136(3), 634–642.
- \*Zanetidou, S., Belvederi Murri, M., Menchetti, M., Toni, G., Asioli, F., Bagnoli, L., ... Masotti, M. (2017). Physical exercise for late-life depression: Customizing an intervention for primary care. *Journal of the American Geriatrics Society*, 65(2), 348–355.