



## Review Article

# Disability Intervention Model for Older Adults with Arthritis: An Integration of Theory of Symptom Management and Disablement Process Model



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## SUMMARY

To evolve a management plan for rheumatoid arthritis, it is necessary to understand the patient's symptom experience and disablement process. This paper aims to introduce and critique two models as a conceptual foundation from which to construct a new model for arthritis care. A Disability Intervention Model for Older Adults with Arthritis includes three interrelated concepts of symptom experience, symptom management strategies, and symptom outcomes that correspond to the Theory of Symptom Management. These main concepts influence or are influenced by contextual factors that are situated within the domains of person, environment, and health/illness. It accepts the bidirectional, complex, dynamic interactions among all components within the model representing the comprehensive aspects of the disablement process and its interventions in older adults with rheumatoid arthritis. In spite of some limitations such as confusion or complexity within the model, the Disability Intervention Model for Older Adults with Arthritis has strengths in that it encompasses the majority of the concepts of the two models, attempts to compensate for the limitations of the two models, and aims to understand the impact of rheumatoid arthritis on a patient's physical, cognitive, and emotional health status, socio-economic status, and well-being. Therefore, it can be utilized as a guiding theoretical framework for arthritis care and research to improve the functional status of older adults with rheumatoid arthritis.

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## Introduction

Rheumatoid arthritis (RA) is a systemic inflammatory autoimmune disease that is characterized by pain, joint stiffness/swelling, fatigue, and subsequent functional limitations and disability (Taibi & Bourguignon, 2003). The average age of persons with RA and the proportion of older adults with RA have increased over time due to longevity and disease chronicity (Helmick et al., 2008). This suggests that RA-related adverse effects on functional status, health care costs, morbidity/mortality, and psychological well-being may increase as well.

Because RA is a chronic, incurable disease, the ultimate goals for its management are to control pain, minimize joint damage, maintain function, and improve quality of life (Hootman & Helmick, 2006). The American College of Rheumatology guidelines

(American College of Rheumatology Subcommittee on Rheumatoid Arthritis Guidelines, 2002) emphasize patient education (e.g., self-care, exercise, and lifestyle changes) with supportive care as one of the most important interventions for optimal management of RA in addition to conventional pharmacological therapies. To achieve these goals, a comprehensive understanding of a patient's symptom experience from his/her perspective, development of effective management strategies, and proper evaluation of subsequent outcomes is essential. In addition, identifying potential interactions among these factors and assessing contextual variables that may affect the symptom experience, interventions, and outcomes are indispensable.

The Theory of Symptom Management (TSM; Humphreys et al., 2008) has been utilized in many studies to understand a patient's symptom experience, management, and outcomes. It is a comprehensive model which includes a wide range of concepts and other contextual variables within three key dimensions of nursing science, person, environment, and health/illness. However, to our knowledge, no study has applied or tested the TSM with arthritis patients. The Disablement Process Model (DPM; Verbrugge & Jette,

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1994) addresses the influence of a disease, other contextual variables, and the relationships among them on functioning. The simplicity and practicality of the DPM make it easy to apply as a conceptual framework for many research studies in persons with various health conditions including arthritis, but also may limit its ability to fully capture a patient's disabling symptom experience and management.

A Disability Intervention Model for Older Adults with Arthritis (DIMOA) is essentially based on the three main concepts of the TSM, with an effort to incorporate key components of the DPM into the TSM. Because the TSM encompasses the key concepts of the DPM, the incorporation of constructs from the DPM into the TSM may provide a more comprehensive framework that can facilitate an understanding of the disablement process and symptom management, as well as guide arthritis care and research. Therefore, the purpose of this paper is to introduce and critique the two models as a conceptual foundation from which to construct the DIMOA.

### Theory of symptom management

The TSM was first introduced by the symptom management faculty group at the University of California, San Francisco School of Nursing in 1994 (Larson et al., 1994). The concept labels and their interrelationships in the symptom management model were revised in 2001 (Dodd et al., 2001). The TSM was proposed in 2008 as a middle range theory for nursing (Humphreys et al., 2008). It comprises three essential components, namely symptom experience, symptom management strategies, and symptom outcomes. Dynamic relationships among these concepts are placed within a three-dimensional sphere of person, environment, and health/illness which are the main domains of nursing science.

#### Main concepts

Symptom experience is a dynamic interaction comprising an individual's perception, evaluation, and response to a symptom (Humphreys et al., 2008). When people notice unusual sensations (perception), they assess the characteristics of their symptom, including severity, location, duration, frequency, cause, curability, and its disabling effect (evaluation). People, then, try to relieve their symptoms by developing their own self-care strategies or seeking health care for more effective interventions (response).

Symptom management strategies aim to avert, delay, or minimize the symptom experience, and its negative outcomes (Humphreys et al., 2008). In order to achieve the goal of symptom management, the specifications of who, where, how much, when, as well as what the intervention strategy involves should be considered (Humphreys et al.).

Symptom outcomes following the implementation of symptom management strategies are measurable. If the strategies are effective, patients may have positive outcomes, including improvement in functional status, emotional status, self-care ability, costs, quality of life, morbidity, and mortality (Humphreys et al., 2008).

The three core concepts of the TSM are continuously interacting with each other, and the bidirectional arrows in the model show this dynamic relationship (Humphreys et al., 2008). The symptom experience may affect or be affected by management strategies and outcomes. As people recognize symptoms, they may implement several management strategies, and assess outcomes. According to the outcomes, their symptom perceptions will be affected, and their management strategies may change. As symptom experience and management strategies are adjusted or changed, their outcomes will be affected. This process may continue repeatedly until symptoms subside or are resolved.

The symptom management process may be interrupted, however, if there is a problem with adherence (Humphreys et al., 2008). If the prescribed strategy is not accepted or utilized at all, or is applied inconsistently, nonadherence may also become a challenging issue. A broken arrow is placed in the model between the management strategies and outcomes to acknowledge this concern.

#### Domains of person, environment, and health/illness

The three main concepts of the TSM are influenced by the surrounding domains of person, environment, and health/illness. Person variables include demographic, physiological, psychological, sociological, and developmental factors which are intrinsic to an individual (Dodd et al., 2001). The domain of environment is the collective milieu where a symptom occurs, including physical (e.g., home, work, or hospital), social (e.g., social network or interpersonal relationships), and cultural (e.g., beliefs, values, attitudes, or behaviors) aspects (Dodd et al.). The health/illness domain consists of health or illness status, risk factors, diseases or injuries, and disabilities that directly or indirectly affect an individual's symptom experience, management strategies, and outcomes (Dodd et al.). In summary, the contextual factors situated in the three domains of person, environment, and health/illness influence or are influenced by the three major components of the TSM by multidirectional interactions.

#### Applications of TSM in arthritis research

The TSM has been utilized in many symptom research studies with diverse populations, including people with asthma (Hardie, Janson, Gold, Carrieri-Kohlman, & Boushey, 2000) or HIV (Tsai, Hsiung, & Holzemer, 2002). To date, however, no study has applied or tested the TSM with arthritis patients. A few studies have explored the symptom experience of persons with arthritis, how they self-manage their symptoms, and the relationship between self-management and functional outcomes. Although the use of the TSM was not explicitly addressed, most of these studies indeed had ideas analogous with those of the TSM.

Radford et al. (2008) for example, interviewed patients with recently diagnosed RA (5–8 months) and patients with more than 5 years of disease duration about the medical care they received and the most helpful support they expected to receive. Four themes emerged, (a) information (symptoms, management strategies, and outcomes), (b) support (emotions, safe environment, and family), (c) choice (talking to other patients or health care providers), and (d) involvement (holistic care, partnership, and joint decisions). Information and support overlapped indicating patients' needs for talking and being listened to. Choice and involvement also overlapped implying proper timing and options for interventions (Radford et al.). The findings of this study suggest potential interventions (e.g., providing educational sessions regarding optimal RA management and helpful resources) that could benefit newly diagnosed RA patients. The issue of when and how to provide them should also be considered to enhance their efficacy.

Musil, Morris, Haug, Warner, and Whelan (2001) investigated the symptom experience of community-dwelling older adults with chronic health problems and whether different symptom patterns influenced management strategies and outcomes over time. The authors examined whether older adults with consistent arthritis or cardiopulmonary symptoms (occurring at all 4 time points in 27 months) reported more symptom management (physician contact, self-care, and use of illness labels) and worse well-being (depression and self-assessed health) than those with intermittent or

inconsistent symptoms (occurring at 3 or fewer time points in 27 months). Patients with consistent arthritis symptoms tended to use more self-care at all time points, to label their symptoms as an illness, and to visit a physician when their symptoms persisted. Patients with consistent cardiopulmonary symptoms were more likely to use an illness label to describe their symptoms than their counterparts. In general, patients with consistent symptoms reported more depression and worse self-assessed health than those with intermittent or inconsistent symptoms (Musil et al.). The strength of this study is that it examined the chronicity of symptoms, and the different impact on symptom management and outcomes.

Many researchers have evaluated the effect of the Arthritis Self-Management Program, a program that has been widely recommended by many national institutions and organizations. It is a small-group, community-based, self-management educational program developed and evaluated by Lorig, Ritter, Laurent, and Plant (2008) at Stanford University. The Program has been found to decrease pain and depression, increase physical activity, and decrease physician visits (Lorig et al.). Lorig and researchers from many different countries have evaluated the effect of this self-management program (management strategies) by assessing baseline pain, fatigue, functional limitations, and disability (symptom experience) and changes in self-efficacy, health status, health behaviors, and health care use (outcomes). Although none of these studies explicitly utilized the TSM in their studies, the underpinning theoretical background is in accordance with the TSM. Therefore, the TSM might be a good fit for these studies.

#### *Limitations of TSM*

The original TSM focused on a single symptom, but the symptom experience may involve several symptoms as a group. Symptom clusters, three or more concurrently occurring symptoms that are associated with each other, may have an adverse and synergistic effect on patient outcomes (Dodd, Miaskowski, & Lee, 2004). For example, older adults with RA often have multiple symptoms, including pain, joint stiffness, and swelling (physical problems) as well as fatigue, depression, or anxiety (psychological problems). These various symptoms may interact with each other, and bring unanticipated consequences to a person's symptom experience, interventions, and outcomes.

The TSM also does not clearly address the influence of the temporal component of time (Humphreys et al., 2008). As acute symptom manifestations are largely different from chronic ones, and a patient's subjective symptom experience may change over time, assessing the symptom experience or selecting symptom management strategies may become more complicated.

The adherence factor may affect all three components as well as the domains of person, environment, and health/illness (Donesky-Cuenco, Janson, Neuhaus, Neilands, & Carrieri-Kohlman, 2007). A patient with RA, for example, who has less joint pain and stiffness will exercise more, and this may improve his/her functional status, and in turn, reduce the painful symptom experience. The adherence component may be affected by the personal characteristics of the patient, the desirability of the interventions to the patient, or the outcomes of specific interventions. Therefore, placing the adherence element between the management strategies and outcomes may be too restrictive (Humphreys et al., 2008).

Finally, as a minor issue, it is somewhat difficult to determine where certain variables should be placed within the model. For example, some crossover concepts exist in both the person and environment domains, (i.e., physical, social and cultural elements) and can be included in both domains.

#### *Strengths of TSM*

In spite of these limitations, the TSM has several strengths. Because the TSM is a very comprehensive and patient-centered model, the TSM can be utilized as a guiding theoretical framework for both research and clinical practice with diverse populations. The TSM leads both researchers and clinicians to be able to explore the symptom experience from a patient's perspective, to develop effective management strategies, and to evaluate symptoms as an outcome following the interventions.

The TSM clearly addresses the dynamic interrelationships among and within the concepts. The concept of symptom experience includes not only the patient's unique and personal symptom perception and evaluation, but also his/her actual response to the strain that the symptom may cause. The TSM implies the important role of a patient in symptom management according to his/her distinctive symptom experience. It suggests the potential responsibilities of family caregivers and health care providers in the development, implementation, and evaluation of symptom management. The TSM also addresses various outcomes, including general health outcomes such as functional status, health care use, and morbidity/mortality, and global health outcomes such as quality of life.

The concept of adherence aids in evaluating the impact of interventions on various aspects of the symptom experience and outcomes. This is because it emphasizes how a patient's readiness, motives, activeness, or confidence leads to successful symptom management and outcomes. The notion of adherence supports the importance of social support and other forms of medical care which are designed to encourage a patient's motivation and self-efficacy.

#### *Disablement process model*

The most recent version of the DPM, proposed by Verbrugge and Jette (1994) describes, (a) how medical conditions affect functioning in particular body systems, physical and mental actions, and daily activities, and (b) how personal and environmental factors exacerbate or delay the disablement process. Four concepts, pathology, impairments, functional limitations, and disability, consist of the main pathway of the DPM.

#### *Main pathway*

Pathology refers to biomedical or physiological abnormalities that are classified as disease, injury or congenital/developmental conditions (Verbrugge & Jette, 1994). As biomedical or physiological abnormalities are not always directly measurable, pathology is often detected indirectly by evaluating signs and symptoms. Impairments are dysfunctions and structural abnormalities in specific body systems that can impact physical, mental, or social functioning (Verbrugge & Jette). Impairments can be evaluated by various medical procedures, including clinical examinations, laboratory tests, imaging procedures, medical history, signs, and symptoms. Functional limitations are restrictions in performing fundamental physical (e.g., mobility and motion/strength) and mental actions (e.g., cognitive and emotional functions) employed in daily life (Verbrugge & Jette). Disability refers to difficulty doing activities in any domain of daily life due to health problems (Verbrugge & Jette). A comprehensive evaluation of all domains of human activities that are meaningful to individuals is crucial in assessing disability.

#### *Risk factors, interventions, and exacerbators*

According to the DPM, the main pathway from pathology to disability may be affected by a variety of contextual factors, including risk factors, interventions, and exacerbators. Risk factors,

also known as predisposing factors, include demographic, lifestyle, biological, behavioral, psychological, social, and environmental characteristics of an individual that may increase the possibility of the occurrence and severity of impairment, functional limitation, and disability (Verbrugge & Jette, 1994).

Interventions by individuals or other health care providers attempt to avoid or delay the disablement process, and are often multiple and changeable. Interventions include the following: (a) extra-individual factors, such as medical care and rehabilitation, medications and other therapeutic regimens, external support, and environment modifications, and (b) intra-individual factors, such as lifestyle and behavioral changes, psychological attributes and coping, and activity accommodation (Verbrugge & Jette, 1994).

When interventions work inappropriately or unexpectedly, it may exacerbate the disablement process. For example, medical procedures and medications may have adverse effects that make conditions even worse. In response to their health problems, people sometimes adjust behaviors or lifestyles inappropriately, or adopt behaviors or attitudes that may actually increase their limitations and disability. Sometimes, because of predisposing environmental or social impediments (e.g., inflexible working hours, architectural barriers, or social prejudice) people cannot do what they want or what they are able to do (Verbrugge & Jette, 1994).

#### *Applications of DPM in arthritis research*

The DPM has been utilized and tested in many disability studies, including studies of individuals with arthritis (Escalante & del Rincon, 1999; Escalante, Haas, & del Rincon, 2005; Katz, Morris, & Yelin, 2006). According to the authors, the concepts of the DPM provide a guiding framework for constructing a research design as well as for applying study findings to patient care, public health, and health policy (Verbrugge & Jette, 1994). Some researchers explicitly mention the use of the DPM as a conceptual foundation for their studies, while others modify or expand it to construct their own study models for specific health conditions.

Escalante and del Rincon (1999) adopted the DPM to investigate the proportion of disability in RA patients that could be explained by the factors in the DPM. Overall, 33% of the variance in disability was explained by the main pathway factors, of which 14% was explained by signs and symptoms as a group (tender/deformed joint count, and morning stiffness). Contextual factors explained 26% of the variance in disability, of which 20% was explained by psychological status (learned helplessness, self-efficacy, and depression). This study found that both the main pathway and external variables considerably affected the functional outcomes of RA. Signs and symptoms were found to have a stronger influence on disability than the disease per se. The importance of psychological factors was supported because of the relatively stronger impact on disability than the disease or its manifestations.

Escalante et al. (2005) tested the hypothetical relationships between impairments and functional limitations of their disablement model of RA, using a structural equation model with the empirical data from 779 subjects. As proposed in the model, researchers hypothesized that two types of RA impairments, joint inflammation (measured by the number of painful, tender, and swollen joints) and joint deformity (measured by the number of deformed joints) would directly lead to functional limitations (measured by shirt-button speed, grip strength, and walking velocity) (Escalante et al., 2005). They found that two types of impairments, including joint inflammation and joint deformity, had strong direct path coefficients towards functional limitations (standardized  $\beta = -.576$  and  $-.564$ , respectively,  $p < .001$ ), which explained 65% of the total variance in functional limitations (Escalante et al., 2005).

Katz et al. (2006) identified the prevalence and predictors of disability in 26 valued life activities (VLAs) covering obligatory, committed, and discretionary activities in RA patients based on the DPM. VLA disability was found to be common in RA patients, with greater disability in committed and discretionary activities as compared to obligatory activities. Disease status measures, including symptoms, were strong predictors of VLA disability, explaining 22%–45% of the total variance in VLA disability. The functional limitations score appeared to mediate the effect of disease status measures on disability, and was a strong predictor of VLA disability (Katz et al.). This study has important implications in that it assessed a wide spectrum of activities, including obligatory, committed, and discretionary activities, and supported the predicted pathway proposed in the DPM. The authors found that disease status measures, including symptoms, were strongly related to functional outcomes. This implies that assessing symptoms of RA patients may be useful for predicting outcomes. As disability may further influence a person's psychological well-being and quality of life (Katz, 2004) identifying predictors of disability in VLAs should be emphasized as an important assessment approach.

#### *Limitations of DPM*

As initially described by Verbrugge and Jette (1994), the DPM does not sufficiently encompass the dynamic and varied aspects of life-long disability and late-life disability, or differentiate their unique impacts on a patient's disabling experience in daily life. The causes of life-long disability are usually congenital/developmental conditions or severe injuries sustained in childhood or youth, with acute and rapid onset. As disability is often severe and irreversible, life-long disabled people have very constrained capabilities that typically are not modifiable. Therefore, they are more likely to care about external support and environmental modifications, rather than expansion of their own skills and activities (Verbrugge & Jette). In contrast, the common causes of late-life disability are chronic diseases, with late and gradual onset in middle or older age. Disability tends to more moderate, limited to some activities at first, but accumulating over time. Late-life disabled people are more likely to focus on restoring their capabilities of doing activities that they once valued and enjoyed, and gradually adjusting to their disabilities. When capabilities are greatly damaged by the disablement process, external supports or environmental modifications become critical. Finally, late-life disability may become similar to life-long disability, but the essence is not the same (Verbrugge & Jette). Therefore, there is a need to find out how the duration and onset of a disease and consequent disability affect the disablement process and personal disability experience.

Although Verbrugge and Jette (1994) mentioned the feedback effects and bidirectional relationships among the main components, the DPM still looks linear, and may miss the underpinning dynamic actions in the disablement process. Researchers have also addressed the concept of global outcomes beyond disability, such as well-being and quality of life, but this has not been reflected within the main pathway of the DPM yet. Users of the DPM may unintentionally miss or ignore these critical outcomes. As disability may further influence a person's psychological well-being and quality of life (Katz, 2004), inclusion of additional outcomes in the main pathway might be helpful in order to comprehensively understand the disablement process and develop the most effective intervention.

#### *Strengths of DPM*

In spite of some limitations, the DPM has been utilized in many studies because of its comprehensiveness and practicality. The DPM



pays attention to medical and social aspects of disability by expanding its conceptual scope to assess diverse forms of activities in a person's daily life. It encompasses person and environment and their interactions in a sociocultural context. It elaborates not only the main pathway from pathology to disability, but also intrinsic and extrinsic risk factors, interventions, and exacerbators which may affect the disablement process. The DPM extends the conventional perspectives of medical, epidemiological, and public health, that is, from medical cure to preventive care. Finally, this model leads researchers to focus on diverse aspects of functional outcomes, such as physical, psychological, and sociocultural, as well as further global outcomes, such as psychological well-being and quality of life.

### Disability intervention model for older adults with arthritis

With a comprehensive understanding of the concepts, applications, strengths, and limitations of the two models, a DIMOA has been created (Figure 1). The DIMOA is essentially based on the TSM, with an effort to incorporate key components of the disablement process of RA into the TSM so that it can be utilized as a theoretical foundation specifically for RA management in research and clinical practice.

The DIMOA includes the three interrelated concepts of symptom management (i.e., symptom experience, symptom management strategies, and symptom outcomes) that correspond to the TSM. Symptom experience is a vigorous interaction consisted of an individual's perception, evaluation, and response to a symptom of RA. Symptom management strategies including self-care/coping skills, social support, and pharmacological therapies intend to divert, delay, or diminish the symptom experience and its undesirable outcomes of RA. Symptom management strategies include health care use/costs, quality of life, and morbidity/mortality.

These main concepts influence or are influenced by contextual factors that are situated within the three domains of nursing science (i.e., person, environment, and health/illness). The domain of person includes demographic, psychological, sociological, physiological,

and developmental factors which are essential to an individual. The domain of environment is the collective setting where a symptom occurs, including physical, social, and cultural aspects. The health/illness domain consists of risk factors, diseases/injuries, and health status that affect an individual's symptom experience, management strategies, and outcomes. The DIMOA accepts the bidirectional, complex, dynamic interactions among all components within the model representing the comprehensive aspects of the disablement process and its interventions in older adults with RA.

Conceptually, the components of pathology and impairments from the DPM fall within the symptom experience dimension, while functional limitations may be conceptualized within the symptom experience or the symptom outcomes dimension depending on the duration and severity of the disease or symptoms and the assessment time point. For example, older adults who have suffered from RA for a long time or those in the flare-up stage may have experienced various devastating disabilities. On the other hand, persons who have undergone relatively short-term symptoms or those in the remission period, may have some functional limitations, but have not proceeded to the disability stage. As disability encompasses physical, cognitive, and emotional aspects of a person's health status that may affect his/her psychological well-being and quality of life, it should be assessed as one of the most important symptom outcomes. By incorporating the concepts of illness trajectory into the model, the DPM begins to address the temporal aspects of a chronic illness that are less evident in the TSM.

The contextual variables of the DPM, including risk factors, intra-individual and extra-individual intervening and exacerbating factors, are all addressed in the TSM as dynamically interrelated domains of person, environment, and health/illness. These various factors may affect or be affected by a person's symptom experience (pathology and impairments), management strategies, and outcomes (functional limitations and disability) that also interact with each other. The contextual domains of person, environment, and health/illness are depicted in the DIMOA as in the TSM, reflecting the dynamic interactions among all domains within the model.

The role of health care providers and the importance of medical treatments for symptom management are not explicitly depicted in

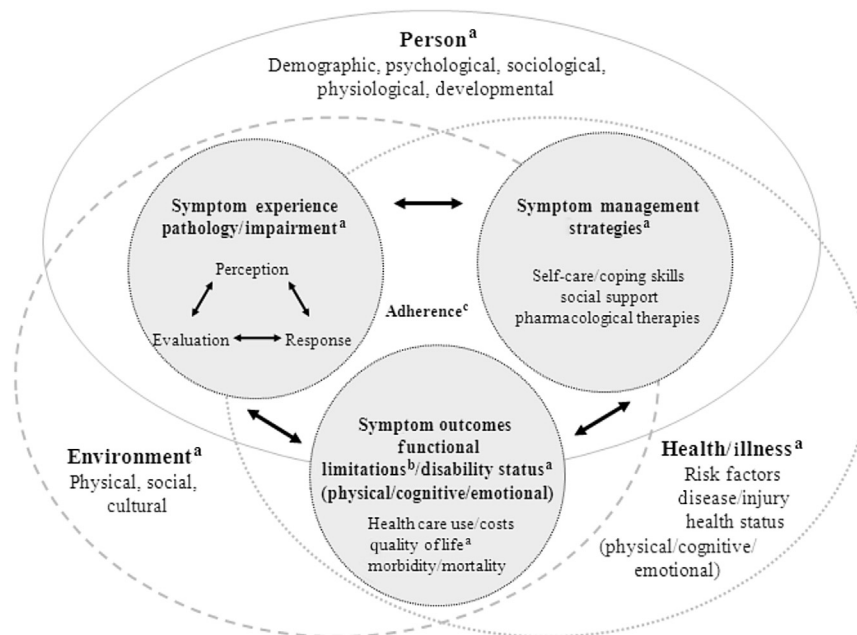


Figure 1. Disability Intervention Model for Older Adults with Arthritis, adapted from the Theory of Symptom Management (Dodd et al., 2001). Note. <sup>a</sup>These elements are also proposed in the Disablement Process Model; <sup>b</sup>This factor may be included in the symptom experience and/or the symptom outcome dimension depending on the disease stage or the assessment time point; <sup>c</sup>Adherence may affect or be affected by all three dimensions.

the TSM. On the other hand, these are clearly presented as extra-individual factors in the DPM. The DPM shows how a patient plays an active role in the symptom management process by performing self-care and coping, changing lifestyles or behaviors, accepting medical care and external support, and modifying physical and social environments. The DPM also shows how others, including family caregivers or health care providers, contribute to a person's symptom management as indispensable collaborators and supporters. Therefore, self-care/coping skills, social support, as well as conventional pharmacological treatments are included in the DIMOA under the dimension of symptom management strategies.

While the adherence component is placed between symptom management strategies and outcomes in the TSM, it is depicted in the middle of the DIMOA. This is because, as mentioned earlier, the adherence component may affect or be affected by all three dimensions, such as symptom characteristics, desirability of the interventions, or health outcomes, as well as their interactions within the model.

Global outcomes (e.g., hospitalization, institutionalization, death, happiness, life satisfaction, and well-being), which may be caused by the long-term disability experience were additionally addressed, but not clearly depicted in the main pathway of the DPM. In the DIMOA, all of these outcomes can be explained and evaluated as symptom outcomes which include a person's various aspects of health status (physical/cognitive/emotional), quality of life, health care use/costs, and morbidity/mortality.

#### Limitations and strengths of DIMOA

Although the DIMOA has been generated to compensate for the aforementioned drawbacks of the DPM and the TSM, it may still have some limitations to be tested in research studies. Understanding the main concepts within a dynamic, three-dimensional sphere of the domains of person, environment, and health/illness may be challenging. In addition, confusion or complexity may still exist because a few variables and certain factors can be included in one or more domains due to their overlapping concepts. The temporal aspect of symptom changes still needs to consideration.

In spite of some possible drawbacks, the DIMOA has potential strengths. It encompasses the majority of the concepts of the DPM and the TSM that have been used and tested directly or indirectly in many studies. It attempts to compensate for the limitations of the two models, and aims to understand the impact of RA on a patient's physical, cognitive, and emotional health status, socioeconomic aspects, and well-being. Therefore, the DIMOA can be used as a guiding theoretical framework for arthritis care and research for understanding disabling symptoms of older adults with RA, developing effective interventions, and assessing a full range of outcomes.

#### Conclusion

The initial step for RA management is to properly and effectively understand a patient's disablement process and symptom experience. Then, developing and providing the most beneficial interventions and identifying and evaluating outcomes should be pursued. In addition, factors that may affect the aforementioned process should be considered within the comprehensive realm of person, environment, and health/illness.

The DIMOA has been constructed based upon the concepts of the TSM and the DPM to serve as a theoretical framework for research and clinical practice. The TSM encompasses the ideas of the DPM, and includes more comprehensive concepts, i.e., dynamic interactions among domains and inter-disciplinary collaborations among patients, family caregivers, and health care providers within the context of the three nursing domains. By incorporating the DPM

into the TSM, the DIMOA can help researchers understand the disabling symptom experience in individuals with RA, their management strategies, and subsequent outcomes that should not be overlooked.

#### Conflict of interest

No conflict of interest has been declared by the author.

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