

Factors Affecting General Practitioners' Transfer of Specialized Self-Care Knowledge to Patients

Weidong Xia, Malgorzata Kolotylo, Xuan Tan

Abstract—This study examines the key factors that influence general practitioners' learning and transfer of specialized arthritis knowledge and self-care techniques to patients during normal patient visits. Drawing on the theory of planned behavior and using matched survey data collected from general practitioners before and after training sessions provided by specialized orthopedic physicians, the study suggests that the general practitioner's intention to use and transfer learned knowledge was influenced mainly by intrinsic motivation, organizational learning culture and absorptive capacity, but was not influenced by extrinsic motivation. The results provide both theoretical and practical implications.

Keywords—Empirical study, healthcare knowledge management, patient self-care, physician knowledge transfer.

I. INTRODUCTION

CHRONIC diseases are currently among the highest and fastest growing healthcare concerns as they were forecasted to be the principal death and disability causes by 2030 [1]. Chronic conditions such as arthritis become more prevalent as people age. For instance, in the period of 2010-2012, in the USA, 22.7% of adults and 49.7% of senior adults (65 years old or above) were diagnosed with arthritis [2]. Arthritis was a major cause of disability among adults in the USA [3] with costs in hundreds of billions [4].

Patients with chronic diseases often have to deal with challenges in their everyday lives as a result of their condition such as a decrease in quality of life or issues related to depression [5]. Chronic diseases not only are prevalent but also require different types of treatment strategies and processes [5]. In contrast to the conventional acute disease treatment situations where the physician is the caregiver and the patient simply complies with the physician's instructions throughout the diagnosis and treatment process, in the chronic disease treatment situations, the patient is her own caregiver and the physician plays a consultative supportive role [6]. Self-care enables patients to keep the symptoms of their illness at bay, ease the pain, reduce their medication use and helps them avoid emergency hospital/clinic visits [7] and can increase the quality of their lives by addressing their social, emotional and mental needs as well as tending to their ailment

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in the long term and facilitating avoidance of injuries or complications [8].

While it has been recognized that the optimal chronic care is achieved when informed, activated patients incorporate self-care knowledge and skills into their daily routines [9], there is a lack of research that examines what motivates and enables healthcare providers, particularly general practitioners, to learn specialized patient self-care knowledge and skills and train the patients during patient visits. In this paper, we refer to general practitioners as primary doctors and nurse practitioners whose responsibilities are to address the immediate (primary) care of the patients – family medicine, including both the first contact for a person with an undiagnosed health concern as well as continuing care of varied medical conditions. Given the frequent interactions that the general practitioners have with patients with non-acute medical conditions, they can effectively train patients with knowledge of chronic diseases and self-care techniques for early detection and preventive treatment. However, a number of barriers may exist that limit the opportunities for patients to benefit from learning self-care knowledge and skills from the general practitioners. General practitioners do not possess the necessary specialized knowledge and self-care skills related to chronic conditions such as arthritis. They may not be motivated to learn such specialized knowledge and self-care skills. In addition, even they possess such specialized knowledge and self-care skills through learning, given the limited interaction time that they have with patients during each visit, they may not be motivated to train patients during a visit that is not related to such chronic conditions. Furthermore, the traditional clinical culture that promotes treatments rather than prevention may inhibit individual practitioners' ability to learn and transfer knowledge. As such, the questions of what motivates and facilitates general practitioners to learn specialized self-care knowledge and skills and transfer such knowledge to patients during their visit remain largely unanswered.

The purpose of this paper is to bridge the above literature gap by addressing the research question: What are the key factors that influence general practitioners' intention to transfer arthritis knowledge and self-care skills that they learned from specialized orthopedic physicians to their patients? Specifically, drawing on the theory of planned behavior [10], [11] and based on field interviews and observations, we examined three types of factors, motivational (intrinsic and extrinsic), cultural, and facilitating factors, as antecedents of general practitioners' intention to train their patients during visits. Theory of planned behavior has been

applied in studying behavioral changes in general and healthcare practitioners' behavior and knowledge sharing in specific [12]-[14].

The empirical data used to test our hypotheses regarding the three types of antecedents and general practitioners' intention to transferring learned arthritis knowledge and self-care techniques were collected by using matched surveys from the same general practitioner before and after a training session provided by specialized orthopedic physicians. The training sessions were conducted onsite in a tier-two orthopedic hospital and at local community health centers in a large southern city in China. Overall, 260 general practitioners participated in the study. The results suggest that a general practitioner's intention to transfer specialized arthritis knowledge and self-care techniques to patients is influenced strongly by intrinsic motivation, organizational learning culture, and her absorptive capacity. Extrinsic motivation, however, does not have a significant influence on a general practitioner's intention to transfer such knowledge.

This study makes a number of contributions. From a theoretical standpoint, to the best of our knowledge, this research is the first to examine factors that influence general practitioners' intention to transfer specialized arthritis knowledge and self-care techniques to patients during their visits. Based on the theory of planned behavior and interactions with general practitioners and patients, this study conducts a systematic investigation of the antecedents of practitioner's intention to transfer knowledge from motivational, cultural and facilitating conditions' perspectives. It further demonstrates that intrinsic motivation is the strongest element influencing practitioner's intention, while extrinsic motivation does not have a significant impact. It also illustrates the importance of organizational learning culture in influencing general practitioners' intention to transfer specialized knowledge. Furthermore, building upon the extant literature related to absorptive capacity, we illustrate the significance of this construct as a facilitating factor that influences general practitioners' intention to transfer specialized knowledge that is new to her own domain knowledge and experience.

From the perspective of healthcare practice, this article can provide guidance for management on how to influence a general practitioner's intention to transfer self-care knowledge to her patients in order to maximize the potential effectiveness of such a process. The paper shows that, as practitioners are driven by intrinsic, rather than extrinsic motivation, the leadership therefore should focus on aligning strategic initiatives and incentives mechanisms with general practitioners' intrinsic motivation. Furthermore, organizational culture is found to be substantial in affecting the knowledge transfer process, and the leadership should strategically develop and nurture a culture that is conducive to enabling general practitioners to transfer self-care knowledge. Since general practitioners' absorptive capacity constitutes a critical facilitating condition, the leadership should pay attention to both general practitioner's self-efficacy and effectiveness of training.

The remaining of our paper is organized as follows. First, we provide a brief overview of the theory of planned behavior and present definitions of our key constructs based on the literature. Second, we present our hypotheses based on the extant literature. Third, we discuss our research methods including the instrument development and data collection approach. Fourth, we present our data analysis results including measurement validation and hypothesis testing. We conclude the paper by discussing the implications of our study findings, limitations of our research, and directions for future research.

II. THEORETICAL BACKGROUND: LITERATURE REVIEW

The constructs and the relationships among them examined in this study were identified and developed based on two sources. First, we used the theory of planned behavior as an overall theoretical basis to define three types of factors, motivational, cultural and facilitating conditions. Two motivational factors, intrinsic and extrinsic, were used to capture the motivational perspective. Second, we conducted extensive interviews and focus group discussions with general practitioners and patients in a number of community health centers in three cities in China to develop a deeper understanding of the practical factors that influence a general practitioner's intention to and actual transfer of her learned arthritis knowledge and self-care techniques to patients during normal patient visits. Below we provide an overview of the theory of planning behavior and definitions of the constructs included in our study.

The Theory of Planned Behavior (TPB) [10], extending the Theory of Reasoned Action (TRA) [15], [16], posits that an individual's attitude towards a behavior, her subjective norm and perceived behavioral control combined form her intention to perform a particular behavior, and in turn, lead to that behavior. By taking into consideration of a person's unequivocal perception of control, the theory expands on the application of TRA to refer not only to merely voluntary but also to intricate behaviors. This is particularly important in the case of health-related behaviors which often involve and are contingent on the performance of a number of other behaviors, such as healthy eating [17].

Researchers have applied TPB to analyze various aspects of physicians' intention to perform behaviors in their work such as intention to prescribe a certain type of therapy [18], disclose diagnosis [19], provide medical care to certain patients [20] or hygiene practice [21]. The vast majority of these studies show a consistently high explanatory and predictive power of the theory in practitioners' intention in the context of their clinical practice, acceptance of technologies and compliance with guidelines [12].

In this study, we drew on the TPB as a theoretical basis to define our antecedents of general practitioners' intention to transfer arthritis knowledge and self-care techniques to patients as a part of patient visit: intrinsic motivation, extrinsic motivation, organizational culture, and absorptive capacity. Table I summarizes our construct definitions and related literature concepts.

TABLE I
CONSTRUCT DEFINITIONS AND LITERATURE SUMMARY

| Construct (abbreviation) | Definition | Related Construct (reference) |
|-----------------------------------|--|--|
| Extrinsic Motivation (EM) | The general practitioner's motivation to transfer knowledge based on tangible objectives, benefits and rewards that can be derived from the knowledge transfer. | <ol style="list-style-type: none"> 1. 'Extrinsic Motivation' defined as the motivation to work primarily due to something separate than the work, such as the reward, promotion or dictate from others [22]. 2. 'Extrinsic Motivation' defined as doing something because it leads to a separable outcome [23]. 3. 'Anticipated Extrinsic Rewards' defined as the extent to which a person believes that they will obtain extrinsic incentives for their knowledge sharing such as monetary incentives, points toward promotion or both [13]. 4. 'Performance-based Rewards System' defined as promotion, advancement, amount of pay and rewards [24]. 5. 'Extrinsic Motivation' defined as external rewards including an expense account and allowances, labor stability, organizational recognition, and promotion [25]. 6. 'Calculative-based mechanism: Extrinsic Rewards' defined as the extent to which an individual believes he or she will receive economic rewards for knowledge sharing [26]. |
| Intrinsic Motivation (IM) | The general practitioner's motivation to transfer knowledge based on enjoyment and feeling of gratification that are consistent with her affective beliefs and values that can be offered by participating in the knowledge transfer. | <ol style="list-style-type: none"> 1. 'Intrinsic Motivation' defined as the motivation to engage in work primarily for its own sake, because the work itself is interesting, engaging or in some way satisfying [22]. 2. 'Intrinsic Motivation' defined as doing something because it is inherently interesting or enjoyable [23]. 3. 'Intrinsic Motivation' defined as direct fulfilment of a person's needs or satisfaction in the content of the activity itself [27]. 4. 'Intrinsic Motivation' defined as knowledge self-efficacy and enjoyment in helping others [28]. 5. 'Intrinsic motivation' defined as doing something for the inherent satisfaction of the activity itself [29], and it was adopted from [23]. 6. 'Intrinsic Motivation' defined as the motivation to engage in work primarily for its own sake, because the work itself is interesting, engaging, or in some way satisfying [30], and it was adopted from [22]. |
| Organizational Culture (OC) | Organizational culture supportive of learning, sharing knowledge, applying new knowledge, applying new practices, encouraging continuous training. | <ol style="list-style-type: none"> 1. 'Organizational culture' defined as a pattern of fundamental assumptions that a group learns as it solves its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive think, and feel in relation to those problems [31]. 2. 'Organizational culture' defined as values, rituals, heroes, symbols and practices [32]. 3. 'Organizational culture' defined as a set of artifacts, values and assumptions concerning a particular behavior [33]. 4. 'Organizational culture' defined as evidenced in positive and negative organizational values [34]. 5. 'Organizational culture' defined in terms of four types: clan (teamwork, involvement, sharing), adhocracy (dynamic, entrepreneurial, creative), market (transactions and competitiveness) and hierarchy (formalization and standards)[35]. |
| Realized Absorptive Capacity (AC) | The general practitioner's self-assessment of the extent to which they understand the knowledge shared by the specialist physician trainer during the training. It constitutes a factor of oneself, that is, the knowledge and skill needed to further train the clinician's patients. | <ol style="list-style-type: none"> 1. 'Absorptive capacity' defined as the ability to ability to recognize the value of new, external information, assimilate it and apply it [36]. 2. 'Absorptive capacity' defined as a set of routines and processes used to acquire, assimilate, transform and exploit knowledge to generate a dynamic capability; AC comprises of two dimensions: potential and realized [37]. 3. 'Absorptive capacity' defined as the stock of prior knowledge of the receiver [38]. 4. 'Absorptive capacity' defined as identifying and recognizing external knowledge, processing and comprehending it, integrating it with current knowledge and putting it into practice [39]. 5. 'Local absorptive capacity' defined as employee's capabilities to acquire, assimilate, transform and exploit knowledge [40], and it was adopted from [36] and [37]. |
| Transfer Intention (TI) | General practitioner's assessment of her intention to apply in the future the arthritis knowledge they just learned during the training. | <ol style="list-style-type: none"> 1. 'Intention' defined as the motivational aspects that impact a person's behavior; it is the indication of how hard a person is willing to try and how much effort they are ready to put in to execute an action/ behavior [41]. 2. 'Physician's intention to share knowledge' defined as the degree to which the doctor engages in sharing knowledge [14]. 3. 'Intention to share knowledge' defined as the degree to which a person believes that they will engage in the act of sharing; explicit and tacit knowledge [13]. |

III. RESEARCH HYPOTHESES

A. Motivation

An individual's motivation to do certain things is either extrinsic or intrinsic, or both [42]. In the intrinsic motivation case, the person is motivated to perform the action for her own gratification, that is, they can obtain satisfaction by the mere fact of participating [30]. The person is willing to carry out the task or behavior, because she appreciates it for its own sake, as it appears enjoyable, 'interesting, engaging, or in some way satisfying' to her [22]. In this study, we define a general practitioner's intrinsic motivation as her motivation to transfer knowledge based on enjoyment and feeling of gratification that are consistent with her affective beliefs and values that

can be offered by participating in the knowledge transfer.

Intrinsic motivation can also be a significant factor driving a person to share knowledge with others [27], [30]. After a few years of practice, general practitioners may arrive at a plateau related to the monetary compensation they wish to receive [43], [44]. General practitioners who are proud to advance their proficiency and qualification exhibit higher levels of job satisfaction [45]. The potential to improve the general practitioners' experience and their relationship with their patients as a result of training them self-care techniques will motivate them to doing so. Furthermore, the possibility to merely enjoy teaching patients as well as knowing that it is important for them, will also encourage the general practitioners to share their knowledge. Thus we propose the

following hypothesis:

H1A. General practitioner's intrinsic motivation towards transferring arthritis knowledge and self-care technique to patients will positively influence her intention to transferring that knowledge.

An extrinsically motivated individual is inclined into executing an action due to the potential of a discrete and separable consequence or reward [30]. A person may be extrinsically motivated through a set of possible direct benefits (monetary incentives such as salary or bonus) or indirect outcomes or advantages (such as recognition, promotion or time off work). The classic assumption posits that money constitutes an objective which enhances a person's 'satisfaction independent of the actual activity itself [46]. In this study, we define general practitioner's extrinsic motivation as her motivation to transfer knowledge based on tangible objectives, benefits and rewards that can be derived from the knowledge transfer.

Extrinsically motivated performance rewards have been found to be positively associated with employee willingness to share knowledge [24]. Extrinsic motivations have also been found to be effective in improving performance and strengthening quality of care [47], [48]. Nurses can be effectively motivated to share knowledge given an opportunity to receive tangible benefits such as a promotion, bonus or wage increase [26]. A general practitioner who is offered the opportunity to obtain a monetary reward or potentially achieve a professional promotion for training her patient self-care techniques during the appointment will be willing to do so. The possibility of getting penalized by the management of the hospital/clinic for not engaging in the process will influence her intention to share knowledge. Thus, we propose the following hypothesis:

H1B. General practitioner's extrinsic motivation towards transferring arthritis self-care knowledge to patients will positively influence her intention to transferring that knowledge.

B. Organizational Culture

Organizational culture constitutes a set of shared practices and assumptions that influence the manner in which employees may perceive, behave or interact with one another [49]. It includes assumptions, values, symbols and artifact [34] or the actual practices which occur in the organization [32]. Organizational culture provides a context and setting for the way the institution or establishment is managed and operated. It can guide and regulate processes that take place within the organization via the formation and implementation of norms concerning the conduct and activities commenced. In this study, we define organizational culture as culture supportive of learning, sharing knowledge, applying new knowledge and new practices and encouraging continuous training.

Organizational culture is one of the most fundamental elements that drive knowledge sharing [13], particularly, if it is a result- or job-oriented culture [50]. An organizational culture which encourages its employees to work as a team, organizes employee involvement initiatives and creates an

atmosphere of support for mutual (employee and organization) commitment positively impacts its employees' participation in knowledge sharing with other staff [35]. The encouragement and reassurance of the leadership and management of the organization also positively influence the commitment of the staff to share knowledge [51], [52]. A hospital/clinic with a culture supportive of knowledge sharing, that is, one which encourages its staff to learn from and share knowledge with one another will inspire the clinician to train her patients. Additionally, a general practitioner who works in an organization which not only prompts its staff to pursue continuing education but also to apply new acquired knowledge into practice will be further influenced to teach her patients. Thus we propose the following hypothesis:

H2. The general practitioner's organizational culture will positively influence her intention to transferring arthritis self-care knowledge to patients.

C. Absorptive Capacity

Although originally developed as an organizational level concept [36], absorptive capacity has been conceptualized and studied as an individual concept [40]. As an organizational level concept, absorptive capacity refers to an institution's ability to identify the value and importance of new information, absorb it, integrate it and apply it to organizational operations. An organization's absorptive capacity, as a function of the institution's prior accumulated knowledge [53], [54], supports innovation [55], learning [36] and knowledge transfer [39]. In this study, we define absorptive capacity as the general practitioner's self-assessment of the extent to which she understands the knowledge shared by the specialist orthopedic physician trainer during the training.

Absorptive capacity constitutes a facilitating condition, that is, the element (characteristic) of oneself or the environment that either hampers or facilitates performance of a task [56], [57]. In this study, it pertains to the arthritis self-care knowledge that the general practitioner has gained during training, which in turns, enables her to further teach her patients. The ability to absorb and incorporate new external knowledge and the already established knowledge base of the recipient affect the effectiveness of a knowledge transfer process [38], [40]. Knowledge stock and absorptive capacity constitute the necessary preconditions for a knowledge transfer to occur within a social system [58]. A general practitioner who believes that she understood the arthritis knowledge and self-care techniques that were discussed during the training and who comprehended the value and potential improvement in her patients' condition as a result of transferring such knowledge to the patients will intend to share it with her patients. The general practitioner's absorptive capacity will play a facilitating condition role in the process of transferring arthritis self-care knowledge to the patients. Thus we propose the following hypothesis:

H3. Absorptive capacity of the general practitioner will positively influence her intention to transferring arthritis self-care knowledge to the patients.

IV. RESEARCH METHODS

This study is a part of a larger longitudinal research that examines the knowledge transfer process and outcomes from orthopedic physician to general practitioners who then in turn transfer the knowledge to patients. The specific knowledge involved in the process was arthritis knowledge and self-care techniques. For the study reported in this paper, we used an integrated multi-method approach that involved five stages. First, we conducted field interviews with general practitioners and patients as well as observations in five community health centers to understand the practical phenomena, importance and challenges involved in motivating and enabling general practitioners to teach patients about arthritis knowledge and self-care techniques during patient visits. This stage served the purpose of understanding and defining relevant practical problems and formulating our research questions. Second, we reviewed the extant literature to identify key constructs and their measures and to develop a systematic understanding of the empirical literature as the basis for developing our research hypotheses. Third, we developed our instruments for assessing the key variables based on literature review, Q-sorting procedures, pretests and pilot-tests. Fourth, we collected two sets of responses using surveys distributed before and after training sessions of general practitioners working community health centers in a large southern city in China. In the final stage, we analyzed the data to validate the measures and to test the hypotheses.

A. Measures

The final items used to measure the variables are shown in Table II. All items were adapted from existing measures in the literature. References [59]-[61] provided the foundation for our development of the measures of organizational culture. These items assessed the extent to which the organizational culture are conducive to learning and knowledge transfer. References [22], [30], [62], [63] served as the basis for the four items we adopted to operationalize intrinsic motivation. These items assessed the extent to which the general practitioners' motivation to transfer learned knowledge to their patients are based on drives that are internal and are consistent with what are important to their beliefs and values. References [22], [27], [63], [64] provided the foundation for the development of the three items we used to measure extrinsic motivation. These items assess the extent to which the general practitioners' motivation to transfer learned knowledge to their patients are based on drives that are external and are consistent with financial or status factors. References [65], [66] served to support the three items we utilized to operationalize absorptive capacity. These items assessed the extent to which the general practitioners actually understood and were ready to apply and teach patients the arthritis knowledge and self-care techniques during patient visits. References [13], [66]-[68] constituted the literature foundation for our development of the four item measures of intention to transfer knowledge. These items assessed the extent to which the general practitioners intended to apply the learned knowledge in their interactions with the patients during patient visits.

TABLE II
 VARIABLES AND MEASURES

| | | |
|----------------------------|-----|---|
| Organization Culture (OC) | OC1 | In our organization, we are encouraged to do continuous training. |
| | OC2 | In our organization, we try to make sure everyone learns from one another. |
| | OC3 | In our organization, we like to share our knowledge with one another. |
| | OC4 | In our organization, we try to apply new medical knowledge that we have learnt. |
| Intrinsic Motivation (IM) | IM1 | I enjoy sharing my knowledge about arthritis. |
| | IM2 | Sharing my arthritis knowledge with patients would give me a chance to improve my own experience. |
| | IM3 | I share arthritis knowledge because I believe it's important for the patients. |
| | IM4 | Sharing arthritis knowledge would ultimately improve my relationships with my patients. |
| Extrinsic Motivation (EM) | EM1 | I am motivated by the financial awards I could derive from sharing knowledge. |
| | EM2 | Sharing my knowledge with my patients would help me with my promotion goals. |
| | EM3 | I may get penalized by my supervisor if I do not share arthritis knowledge with my patients (reverse coded). |
| Absorptive Capacity (AC) | AC1 | I understood what the instructor discussed about arthritis in the training. |
| | AC2 | I understood how the arthritis knowledge that the instructor taught me would improve patient arthritis condition. |
| | AC3 | I understood how the self-treatment techniques work for the patients. |
| Intention to Transfer (IT) | IT1 | I intend to follow the recommendations from the training about patient self-treatment of arthritis. |
| | IT2 | I intend to teach patient changes on things like diet and exercise as recommended by the training. |
| | IT3 | I intend to incorporate arthritis self-treatment techniques in my practice. |
| | IT4 | I intend to incorporate what I learned from the training into what I already know. |

B. Data Collection Process

Two survey data were collected from the same general practitioners before and after the training sessions that they participated in. The training sessions were conducted by experienced orthopedic physicians in two settings. The first setting was at a mid-size orthopedic hospital in China. The second setting was at community health centers. Each training session included three parts. In the first part, basic concepts and theories related to arthritis were introduced to the general practitioners. In the second part, specific arthritis self-care knowledge and techniques were introduced. In the third part, hands-on arthritis self-care techniques were demonstrated and practiced. Each training session lasted about four hours. Training materials included presentation and handout materials. Each general practitioner was also provided with ten sets of video discs and handout booklets that they could give to their patients. For this study, organizational culture is a precondition of the context and therefore was assessed in the survey that the general practitioners completed before the training. In order to assess the other four variables, the general practitioners needed to have finished their training. Therefore, data related to the other four variables were collected in the second survey that the general practitioners completed after the training.

TABLE III
SAMPLE CHARACTERISTICS

| | N | Percentage |
|--|------|------------|
| Gender | | |
| Male | 99 | 39% |
| Female | 154 | 61% |
| Age | 35 | |
| General practitioner type | | |
| Primary physician | 73 | 29% |
| Specialist | 57 | 23% |
| Nurse Practitioner | 82 | 33% |
| Other | 37 | 15% |
| Professional ranking | 249 | |
| Entry-Level | 143 | 57% |
| 1=Junior-Level | 77 | 31% |
| 2=Mid-Level | 17 | 7% |
| 3=Senior-Level | 1 | 0% |
| 4=Unranked | 11 | 4% |
| Total number of years worked in healthcare industry | 12.4 | |
| Total number of years worked in this hospital/center | 9.1 | |

TABLE IV
VARIABLE CORRELATIONS AND RELIABILITY

| | OC | IM | EM | AC | IT |
|----|-------------|-------------|-------------|-------------|-------------|
| OC | .892 | | | | |
| IM | .452** | .920 | | | |
| EM | -.018 | .084 | .916 | | |
| AC | .492** | .636** | .013 | .880 | |
| IT | .542** | .830** | .043 | .649** | .923 |

** . Correlation is significant at the 0.01 level (2-tailed).

C. Sample Characteristics

In July 2015, Directors of 25 community health centers in a large southern city in China were contacted to collaborate to participate in the longitudinal study over a four-month period. A main incentive for the general practitioners was that participating in the training and the study would earn them the required annual continued professional development credits. The training session was offered to the general practitioners free of charge, therefore, there was also a cost saving incentive. In return to these incentives, the general practitioners would complete the surveys during the study period. The training sessions and the two surveys used in this study were conducted between November 2015 and January 2016. Overall, our final matched sample between the two surveys, pre- and post-training respectively, included 260 general practitioners answered the questionnaire. Table III illustrates the characteristics of the sample.

V. DATA ANALYSES AND RESULTS

A. Measurement Validation

Before we test the hypotheses, we examined the reliability and construct validity of the measures. First, we calculated the Cronbach's alphas of the measures as indicators of the internal consistency of the measures. Table IV shows the correlations among the variables and the Cronbach's alpha coefficients in diagonal for the corresponding variables. All reliability estimates are above .88 indicating adequate measurement reliability.

Second, we tested the convergent and the discriminant validity of the measures by examining the correlations among the measurement items of the various variables and by examining the factor loadings of the items. As shown in Table V, all measures had much higher correlations among the items that belong to the same variable than those with the items that belong to the other variables. Table VI presents the results of a factor analysis by using Varimax rotation. The measurement items loaded cleanly onto the corresponding factors, explaining about 82% of the variances in the orthogonally rotated factor solution. The results of Tables IV-VI suggest that the measures had adequate reliability, and convergent and discriminant validity and that we can proceed to test the hypotheses.

TABLE V
ITEM CORRELATIONS, CONVERGENT AND DISCRIMINANT VALIDITY

| | OC1 | OC2 | OC3 | OC4 | AC1 | AC2 | AC3 |
|-----|------------|------------|------------|------|------------|------------|-------|
| OC1 | 1.00 | | | | | | |
| OC2 | .72 | 1.00 | | | | | |
| OC3 | .59 | .76 | 1.00 | | | | |
| OC4 | .57 | .67 | .73 | 1.00 | | | |
| AC1 | .36 | .35 | .35 | .46 | 1.00 | | |
| AC2 | .33 | .35 | .40 | .47 | .80 | 1.00 | |
| AC3 | .35 | .38 | .42 | .42 | .68 | .67 | 1.00 |
| | IM1 | IM2 | IM3 | IM4 | EM1 | EM2 | EM3 |
| AC1 | .51 | .44 | .41 | .44 | .03 | .02 | -.03 |
| AC2 | .61 | .57 | .55 | .43 | .06 | .04 | -.01 |
| AC3 | .52 | .55 | .55 | .50 | .00 | -.01 | -.03 |
| OC1 | 0.31 | 0.32 | 0.24 | 0.37 | -0.05 | -0.05 | -0.05 |
| OC2 | 0.38 | 0.36 | 0.28 | 0.31 | -0.04 | -0.03 | -0.01 |
| OC3 | 0.41 | 0.36 | 0.29 | 0.31 | 0.01 | 0.02 | 0.03 |
| OC4 | 0.51 | 0.46 | 0.37 | 0.39 | 0.01 | 0 | -0.02 |
| IM1 | 1.00 | | | | | | |
| IM2 | .79 | 1.00 | | | | | |
| IM3 | .74 | .86 | 1.00 | | | | |
| IM4 | .62 | .71 | .71 | 1.00 | | | |
| EM1 | .09 | .11 | .09 | .13 | 1.00 | | |
| EM2 | .07 | .11 | .07 | .09 | .85 | 1.00 | |
| EM3 | .01 | .05 | .02 | .01 | .71 | .79 | 1.00 |

TABLE VI
FACTOR ANALYSIS

| | OC | IM | EM | AC |
|--------------------|-------------|-------------|-------------|-------------|
| OC1 | .790 | .156 | -.049 | .121 |
| OC2 | .894 | .163 | -.033 | .114 |
| OC3 | .852 | .161 | .032 | .185 |
| OC4 | .767 | .278 | .000 | .265 |
| IM1 | .232 | .791 | .022 | .333 |
| IM2 | .228 | .886 | .046 | .256 |
| IM3 | .133 | .902 | .017 | .242 |
| IM4 | .227 | .803 | .078 | .185 |
| EM1 | -.034 | .084 | .919 | .010 |
| EM2 | -.014 | .055 | .950 | .001 |
| EM3 | .001 | -.023 | .902 | -.028 |
| AC1 | .204 | .240 | .006 | .893 |
| AC2 | .242 | .346 | .000 | .855 |
| AC3 | .222 | .411 | -.041 | .724 |
| Cum. Var Extracted | 43.694 | 62.352 | 74.602 | 81.965 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser

B. Hypothesis Testing

We used OLS regression as suggested by [69] to test our hypotheses. We created our scales by computing the means of the items that measured each variable. Intention to transfer (IT) was entered into the regression as the dependent variable whereas IM, EM, CM and AC as entered as the independent variables. As shown in Table VII, the overall equation explained a significant portion of variance in IT (Adjusted $R^2=.731$).

TABLE VII
 FACTOR ANALYSIS

| ANOVA ^a | | | | | |
|--------------------|----------------|-----|-------------|---------|-------------------|
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| Regression | 138.437 | 4 | 34.609 | 171.321 | .000 ^b |
| Residual | 49.898 | 247 | .202 | | |
| Total | 188.335 | 251 | | | |

a. Dependent Variable: IT

b. Predictors: (Constant), IM, EM, OC, AC
 Adjusted $R^2=.731$

TABLE VIII
 REGRESSION COEFFICIENTS

| | Beta | t-value | Sig. |
|------------|-------|---------|-------|
| (Constant) | -0.04 | -0.17 | 0.86 |
| IM | 0.66 | 15.16 | 0.001 |
| EM | -0.01 | -0.34 | 0.74 |
| OC | 0.17 | 4.47 | 0.001 |
| AC | 0.14 | 3.24 | 0.001 |

Our hypothesis 1A predicted a positive relationship between a physician's intrinsic motivation towards transferring arthritis self-care knowledge to her patient and her intention to transferring that knowledge. As shown in Table VIII, IM had a beta coefficient of .66 that is significant at $p=.001$. As such, our hypothesis 1A was supported. Hypothesis 1B predicted that a general practitioner's extrinsic motivation towards transferring arthritis self-care knowledge to her patient would positively influence her intention to transferring that knowledge. However, the regression coefficient for EM was -0.01 and was not significant. As such, our hypothesis 1B was not supported.

Hypothesis 2 predicted that the culture of the organization which the general practitioner is based at will positively influence her intention to transferring arthritis self-care knowledge to the patients. Table VIII shows that OC had a regression coefficient of .17 with a significance level of $p=.001$. Therefore, our hypothesis 2 was supported.

Hypothesis 3 predicted that a physician's absorptive capacity would positively influence her intention to transferring arthritis self-care knowledge to the patients. The results show that AC had a regression coefficient of .14 with a significance level of $p=.001$. As such, our hypothesis 3 was supported.

Overall, of the four hypotheses that we proposed, three were supported whereas one hypothesis concerning the relationship between a physician's extrinsic motivation to transferring self-care arthritis knowledge and her intention to

transferring was not supported. In the next section, we discuss the implications of our study results, limitations of our study and directions for future research.

VI. DISCUSSION

Our analysis results suggest that all hypotheses were supported except for extrinsic motivation which turned out to be not only insignificant but also negative (contrary to what we initially expected). This result confirms prior findings [25], [27] which did not find significant extrinsic effects, indicating that tangible incentives such as monetary rewards or promotion do not motivate general practitioners to transfer knowledge to their patients. Intrinsic motivation, confirming earlier research, positively influences general practitioner's intention to transfer knowledge to the patients [30]. Our findings provides further empirical support to the prior research studying the intrinsic motivation of physicians to teach [29] by showing that general practitioners are significantly motivated by the experience of transferring knowledge, enjoyment of it, recognition of its importance to the patients (receivers) and the fulfilment of building a relationship with them.

By showing that organizational culture can significantly and positively impact general practitioner's intention to transfer knowledge, we provide further empirical evidence and corroborate the findings of prior research [13], [70]. We show support for those results and advance them, by studying this issue in a specific context – healthcare. Our findings indicate that a hospital/clinic culture which encourages learning, sharing of knowledge among the staff, attending advanced trainings and courses can also influence the general practitioner's intention to transfer newly learned specialized arthritic knowledge and self-care techniques with the patients. The organizational environment should further support, once acquired, applying new knowledge in practice.

Our analysis confirms the role of and need of a facilitating condition for the general practitioner's intention to transfer knowledge. We corroborate prior research indicating that one's knowledge competence positively influences her intention to transfer the knowledge [62], [65]. We also show that, at the individual level, the importance of establishing a stock of knowledge for one to be willing to participate in knowledge sharing [38], [40], [71]. Furthermore, by operationalizing absorptive capacity not only as the general practitioner's comprehension of new self-care arthritis knowledge, but also her understanding of how the transfer of such knowledge would help improve the patient's condition, we also indicate that both the general practitioner's self-efficacy and the effectiveness of the training in guiding the general practitioner to comprehend the complex set of knowledge and its potential benefits impact the general practitioner's intention to transfer knowledge.

A. Theoretical Implications

Our study demonstrates the substantial impact of intrinsic motivation on the intention to share knowledge and joins in the, so far inconclusive, discussion of the role of extrinsic

incentives. We further address and support the call for a reevaluation of tangible benefits in medical practice and influencing physician behavior [72]. As the findings indicate the relationship between extrinsic motivation and transfer intention is insignificant here, the paper questions the relative importance of tangible incentives. Additionally, the article examines the construct of absorptive capacity at the individual level, and, by conceptualizing it as the perceived understanding of knowledge, shows how an effective knowledge transfer can play the role of a prerequisite to, in turn, the initial receiver's further knowledge transfer intention. Moreover, we corroborate earlier research related to the positive influence of organizational culture on knowledge transfer by showing how such a culture can be conducive to enabling the practitioner to learn and transfer knowledge.

B. Practical Implications

Our study informs healthcare administration about the key factors they need to take into consideration when developing and proposing policy mechanisms in order to optimize the effectiveness of chronic condition self-care knowledge transfer processes. More specifically, management should facilitate and ensure organizational culture and environment which would support learning, encourage knowledge sharing among the staff members and participation in continuous training. The effectiveness of physicians' preparation/ training should also be safeguarded, as to enhance their acquisition and assimilation of the new knowledge. This will in turn constitute a solid foundation for them to further share such knowledge with their patients. Interestingly, financial incentives or rewards systems do not seem to institute a fruitful method of motivation; administration should however, pay particular attention to intrinsic drivers. They should ensure that participation in the trainings is enjoyable and that physicians being trained are well informed about the potential benefits that such knowledge could provide for their patients' condition as well as the relationship that they have with their patients.

C. Limitations

The results of the study should be interpreted with caution because of the research limitations. As the study focuses on the intention to transfer knowledge by the general practitioners, it does not indicate their actual behavior of doing it. Further research should test this model with intention as the mediator and the action of self-care knowledge transfer between the general practitioner and the patient. Furthermore, the model does not take into consideration of potential barriers to the transfer (such as limited appointment duration) and the role they could play in the physician's intention. Further studies should include aspects, such as time of appointment or stress experienced by the practitioner to investigate how they could affect current results. In addition, the intention to transfer knowledge does not guarantee that the transfer would be effective, as the success of knowledge transfer depends not only on the factors associated with the source, but also the receiver. Further research should analyze the matched pair

data (general practitioner and patient) in order to examine how the self-care knowledge transfer processes could be optimized.

D. Future Research

As the overall findings within this stream of research remain somewhat contradictory, particularly in the case of extrinsic motivation and the collective (external) outcome expectation within intrinsic motivation, future studies should consider additional variables which could potentially moderate (or mediate) the relationship between these antecedents and physician's intention to transfer knowledge. For example, [24] and [26] showed a significant positive association between extrinsic motivation and the willingness to/ and knowledge sharing. As such, further research is needed to provide alternative explanations to the inconsistent findings regarding the effect of extrinsic motivation, in particular, conditions under which the dynamic of this relationship changes. Potential factors that could be taken into consideration are current income, stage of career development, time or personal characteristics (that is, what motivated the physician to choose her occupation in the first place). An interesting area to examine would also be whether organizational culture could in any way change the dynamic of either intrinsic or extrinsic motivation of the general practitioner. References [43] and [44] carried out research indicating a plateau of physician's financial incentives should be explored further to potentially explain this issue. The role of such factors as duration of practice or amount earned could be considered to have a moderating effect on the effect of extrinsic motivation on practitioner's intention to transfer knowledge. In addition, the relationship between the general practitioners and their patients may moderate the practitioner's expected collaborative outcome.

VII. CONCLUSION

The widely recognized benefits of self-care of patients with such chronic conditions as arthritis cannot come to fruition without the general practitioner's involvement particularly training patients during normal visits. However, there has been a lack of understanding about what influences the general practitioners to learn and transfer specialized chronic disease knowledge and patient self-care techniques. As a part of a larger longitudinal study, this paper suggests that intrinsic motivation, organizational culture, absorptive capacity, but not extrinsic motivation, are important factors that healthcare organizations need to consider in order to have more general practitioners participate in enabling the patients' self-care of arthritis conditions. We call on researchers to extend our study by considering additional factors, both mediating and moderating, that will further our understanding of the antecedents of general practitioners' intention to, and actual behavior of, knowledge transfer and the effects of such knowledge transfer on patient-based outcomes.

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