


Quality of primary health care and autonomous motivation for effective diabetes self-management among patients with type 2 diabetes

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Abstract

This study showed, in line with self-determination theory, that of the six central quality dimensions of primary health care (access to care, continuity of care, diabetes counseling, autonomy support from one's physician, trust, patient-centered care), autonomy support from one's physician was most strongly associated with autonomous motivation (self-regulation) for effective diabetes self-management among patients with type 2 diabetes ($n = 2866$). However, overall support for diabetes care received from friends, family members, other patients with diabetes, and health care professionals may even play a greater role.

Keywords

diabetes, health care quality, motivation, primary care, self-management

Introduction

Type 2 diabetes has reached epidemic scope all over the world (Guariguata et al., 2014; Whiting et al., 2011). Approximately 415 million adult people had diabetes in 2015, and this number is expected to rise to 642 million by 2040 (International Diabetes Federation, 2015). In Finland, approximately 500,000 people have type 2 diabetes (THL, 2016), which is about 10 percent of the total population. Aging of the population, diet rich in energy, lack of physical exercise, and overweight are strongly associated with the development of this chronic disease (Unwin et al., 2010). Diabetes mellitus type 2 is a metabolic disorder characterized by chronic hyperglycemia, and the main target in diabetes care is to achieve and maintain glycemic control in order to avoid and reduce micro- and macrovascular complications associated with diabetes (Alberti and Zimmet, 1998; American Diabetes Association, 2014). Good glycemic control requires significant alterations to lifestyle and completion of various self-management tasks, such as engaging in regular physical exercise, healthy diet, weight loss, and pharmacologic therapy when needed (American Diabetes Association, 2014). Primary health

care faces a great challenge in promoting patients to value and internalize the importance of healthy lifestyle.

Patients are advised to carry out daily activities that they may find uninteresting. That is, activities are not spontaneously adopted and done for their inherent satisfactions (Ryan and Deci, 2000). If such uninteresting behaviors are performed over a long time period, they must be instrumental for desired outcome, and patients must come to value the behaviors and personally endorse their importance (Ryan et al., 2008). The more autonomously motivated a patient is toward a suggested behavior, the more likely he or she will stay engaged with that behavior and put effort into it (Patrick and Williams, 2012). It is important to know

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how primary health care is able to support the internalization process leading to patients' autonomous motivation for effective diabetes management, that is, self-determined regulation of health behavior. How great role do dimensions of health care quality play in this process?

Health care quality can be defined in various ways. A widely used way to define quality is to base the definition on Donabedian's system-based model, which differentiates between structure, process, and outcome of care (Donabedian, 2005). For this study, we found it useful to apply the model of Campbell et al. (2000) in order to analyze the effect of different quality dimensions of care on patients' autonomous motivation. This model states that there are two principal dimensions of quality of care: access and effectiveness. The definition of quality of care is: *whether individuals can access the health structures and processes of care which they need and whether the care received is effective*. Access and effectiveness are related to health care structures, processes, and outcomes defined by Donabedian (2005).

One sub-component of access is organizational access, for example, the length and availability of appointments to a doctor or a nurse. Another sub-component of access is continuity or longitudinality of care. Continuity of care may be beneficial or harmful depending on communication and other professional skills of the doctor (Campbell et al., 2000).

Effectiveness is divided into two key components: effectiveness of clinical care and effectiveness of interpersonal care. Both of these components should be related to need. Clinical care refers to knowledge-based care which consists of evidence-based medicine (scientific evidence of a link between process and outcome) and care which is regarded as legitimate (widely accepted without necessarily having scientific evidence of effectiveness, for example, primary care counseling). Interpersonal care refers to the interaction between health care professionals and patients. Interpersonal care is effective if it is patient-centered, that is, patients get explanation about their symptoms, they are involved in care decisions, care responsibility is shared between doctor and patient, and health professionals manage to build a relationship of trust and understanding (Campbell et al., 2000).

Patient-centeredness is strongly emphasized in the Chronic Care Model (CCM) which is initiated to meet the challenges of the rising prevalence of chronic diseases, such as type 2 diabetes, and is widely adopted to redesign practices in order to improve quality of care for the chronically ill (Coleman et al., 2009; Epping-Jordan et al., 2004; Wagner et al., 2001). CCM focuses on self-management support, which includes collaborative goal setting, problem solving, and follow-up, as well as planned proactive care. In Finland, CCM is adopted by the Ministry of Social Affairs and Health (MSAH), as the main strategic tool in prevention of chronic illnesses and improving quality and cost-effectiveness of care in health centers (Muurinen and Mäntyranta, 2011).

Patient-centeredness is emphasized also in self-determination theory (SDT) (Deci and Ryan, 1985). Autonomy supportive health care climate characterized by an empathic and warm interpersonal care environment, and support for patients' sense of autonomy and competence, is assumed to facilitate internalization of the importance of effective self-care leading to autonomous motivation and permanent behavior change. Autonomous motivation is contrasted with controlled motivation. Autonomous motivation means that healthful activities originate from the self, that is, individuals engage in them for internal reasons such as (a) out of pleasure they give (intrinsic regulation), (b) because they value healthy lifestyle and perceive it to be important (identified regulation), or (c) because they have internalized the value of healthy lifestyle and integrated it into their personal value system (integrated regulation). In contrast, individuals with controlled motivation engage in healthful activities for external reasons such as (a) to get a reward, avoid punishment, or comply with social pressures (external regulation) or (b) to avoid guilt or shame or because of a need to prove something (introjected regulation). Thus, controlled motivation is less likely to lead to long-term behavior change.

Trust is a fundamental element for the effectiveness of health care (Gilson, 2003). In medicine, trust is seen as patients' trust that health care professionals are competent, take appropriate responsibility and control, and give their patients' welfare the highest priority (Hupcey et al., 2001; Mechanic and Schlesinger, 1996). Patients are seen in general to trust health care professionals, so-called generalized trust (Dinç and Gastmans, 2013). However, trust is strongly related to the assessment of professional competence and quality of interaction. Thus, the development of trust is a process, during which trust could be broken and re-established (Dinç and Gastmans, 2013; Jones et al., 2012).

Why would dimensions of health care quality, such as access and continuity of care, patient-centered care, autonomy supportive health care climate, and trust, be effective for internalization of the importance of lifestyle change? Theories focusing on health behavior change or motivation behind health behavior change, such as SDT, have shed light on this social psychological phenomenon. SDT focuses on patients' motivation for health behavior change and its maintenance, and on social conditions that nurture or inhibit internalization (Deci and Ryan, 1985). The basic idea in SDT is that people are oriented toward physical and psychological health (Ryan and Deci, 2000; Williams et al., 2009). That is, they have an innate desire to remain healthy and functional. They also have psychological needs for autonomy, competence, and relatedness. Internalization of the importance of health behavior change occurs most likely in social environments where these basic psychological needs are satisfied, and need satisfaction gives psychological energy for the initiation and long-term maintenance of health behaviors (Ryan and Deci, 2000).

Sense of relatedness is centrally important for internalization (Ryan and Deci, 2002). The prompted behaviors are most likely adopted and maintained if patients feel connected with health care professionals and trust them (Ryan et al., 2008). In an emphatic and warm interpersonal care environment, the psychological need for belongingness and connectedness with others is met, which promotes internalization of the value of effective self-care (Ryan and Deci, 2000). Patients are open for information and apt to adhere with recommendations (Ryan et al., 2008). However, relatedness alone is not enough. Patients also need to feel competent to perform self-care activities. Otherwise they will find an excuse not to do the behaviors (Ryan and Deci, 2002). A sense of competence is enhanced by supporting patients' belief for success, by giving constructive feedback, by skills building and problem solving, and by creating a challenging but realistic action plan (Patrick and Williams, 2012).

Along with a sense of relatedness and competence, also a sense of autonomy is extremely important for transforming a value and regulation into one's own. According to Ryan and Deci (2002), internalization presupposes valuing self-care and a healthy lifestyle. A sense of autonomy is growing in a care environment where people experience freedom from external demands. Thus, health care professionals should listen to patients' opinions before care recommendations, offer choices, minimize control, and explain a rationale for given advices (Patrick and Williams, 2012). A sense of autonomy facilitates competence because when people are volitionally engaged, they are ready to learn new skills (Ryan et al., 2008).

Accumulated research suggests that autonomous motivation for self-care, and adherence to care, are most likely to be evident when patients experience trust and support for relatedness, autonomy, and competence as predicted by SDT (Fortier et al., 2012; Ng et al., 2012; Ryan and Deci, 2000). Safran et al. (1998) found that of the seven defining elements of primary care (accessibility, continuity, comprehensiveness, integration, clinical interaction, interpersonal treatment, and trust), physician's comprehensive ("whole person") knowledge of patients and patients' trust in their physician were the variables that were most strongly associated with adherence to physician's advice. In addition, higher trust in physicians has been shown to be related to better assessments of ability to complete diabetes care activities (Bonds et al., 2004) and stronger self-efficacy and outcome expectations, which in turn were associated with better treatment adherence and diabetes outcomes (Lee and Lin, 2009). Several studies have found that autonomous or self-determined motivation for diabetes care predicts increased physical exercise (Silva et al., 2010; Teixeira et al., 2012a; Koponen et al., 2017a), success in weight loss (Williams et al., 1996; Koponen et al., 2017b), medication adherence (Williams et al., 1998), and ability to regulate glucose levels (Ng et al., 2012; Williams et al., 1998, 2004).

Practices redesigned in accordance with the CCM principles have succeeded to improve care outcomes in various chronic illnesses, for example, to decrease the risk of cardiovascular disease among diabetic patients (Coleman et al., 2009).

This study investigates whether, and how strongly, the six central quality dimensions of primary health care measured in this study (access to care, continuity of care, diabetes counseling, trust, patient-centered care, and autonomy support from one's physician) are associated with autonomous motivation (self-regulation) for effective diabetes self-management among patients with type 2 diabetes. We hypothesize that trust, patient-centered care, and autonomy support from one's physician are most strongly associated with patients' autonomous motivation.

Methods

Study design

We carried out a mail survey in 2011. Patients with type 2 diabetes were identified from the register of the Social Insurance Institution of Finland (SII). SII is a Finnish government agency (funded directly from taxation) in charge of settling benefits under national social security programs. SII keeps the register of persons entitled to a special reimbursement for medicines for chronic diseases such as diabetes. The sample of this study was collected among persons who fulfilled the following inclusion criteria:

- (a) Had entitlement to a special reimbursement for medicines used in the treatment of type 2 diabetes (ICD-10 code, E11) in 2000–2010, and the right was valid in September 2011 and onward;
- (b) Born in 1936–1991 (20–75 years), alive and had no safety prohibition at the time of the data collection;
- (c) Finnish as native language;
- (d) One of the five study municipalities as place of residence.

A total of 7575 persons fulfilled the inclusion criteria. Based on power analysis, a sample of 5167 persons was collected: 2000 persons from the two large municipalities and all persons from the three small municipalities. There were 2962 (57%) men and 2205 women (43%) in the sample, corresponding to gender rates in the total population of patients with type 2 diabetes in the study municipalities.

The authors of this study tested the questionnaire by a pilot study ($n=50$) in May 2011 and revised the questionnaire after which it was mailed to respondents by the SII in September 2011. A reminder to non-respondents was sent out in October, and another reminder with a new copy of the questionnaire was sent out in November. The final response rate was 56 percent ($n=2866$). Women responded slightly more often (57%) than men (54%). The response rate was highest (63%) in the eldest age group (65–75 years),

lower (55%) in the age group of 55–64 years, and lowest (36%) in the age group of 20–54 years.

Ethical issues

The research plan was accepted by the Ethical Committee of the Hjelt Institute, University of Helsinki, and the permission to conduct the study was received from the SII. The sample was collected by a contact person (a qualified statistician) who worked at the SII, and the questionnaires were posted from there. Respondents returned filled questionnaires, provided only by an identification number, directly to the researchers by mail. An identification number was needed in order to check for nonresponse. Identity of respondents was not revealed to the researchers at any stage of the sample or data collection, nor was the content of the questionnaires revealed to anybody else except the researchers.

Respondents

The mean age of respondents was 63 years (standard deviation (SD), 8 years; range, 27–75 years), and 56 percent of them were men. The median diagnosis age was 55 years and the median time having had diabetes was 8 years. Over half (56%) of the respondents were retired because of old age, 60 percent were married, and 40 percent had higher professional education. The majority (83%) of the respondents had a municipal primary care health center as their current and principal care place in diabetes care, and 74 percent used tablets only for diabetes therapy (Table 1). Almost all (97%) had another chronic illness which in most cases was hypertension (72%), and a total of 41 percent had an additional diabetes-related disease.

Measures and statistical procedures

All measures used in the study are presented in Table 2. The English versions of the Patient Assessment of Chronic Illness Care (PACIC) Questionnaire, the Health Care Climate Questionnaire (HCCQ), and the Treatment Self-Regulation Questionnaire (TSRQ) were translated into Finnish in a structured procedure, which included forward and backward translations by different translators. The Finnish version of the PACIC scale has been validated (Simonsen et al., 2017). The Trust-Questionnaire was created for this study because none of the existing trust measures were assessed to be suitable as such for this study. Cronbach's alphas of the measures varied from 0.86 to 0.95 and can be regarded excellent (over 0.80; Andresen, 2000). Averaged sum scales for overall access to care, diabetes counseling, trust, patient-centered care, autonomy support from one's physician, and autonomous motivation were calculated. The respondent was included in the analysis if she or he had answered at least 70 percent of the scale items (Table 2).

Table 1. Sociodemographic background factors of respondents.

	N	%
<i>Sex</i>		
Man	1598	55.9
Woman	1262	44.1
Total	2860	100
<i>Age</i>		
27–54 years	356	12.7
55–64 years	1064	37.9
65–75 years	1386	49.4
Total	2806	100
<i>Marital status</i>		
Single	278	9.8
Married	1698	59.8
Cohabiting	191	6.7
Divorced	421	14.8
Widowed	251	8.8
Total	2839	100
<i>Professional education</i>		
Upper secondary education (vocational school) or less	1671	59.8
Higher education (college, polytechnic, university)	1121	40.2
Total	2792	100
<i>Principal activity</i>		
Working	675	24.0
Retired because of old age	1567	55.8
Retired because of chronic illness	386	13.7
Other	182	6.5
Total	2810	100
<i>Diabetes medication</i>		
Tablets	2043	73.8
Insulin	145	5.2
Tablets + insulin	513	18.5
Other (e.g. GLP-I analog or no medical treatment)	66	2.4
Total	2767	100
<i>Service provider</i>		
Municipal	2254	83.3
Private	451	16.7
Total	2705	100

Descriptive statistics were estimated, and in the final analyses, multivariate linear regression analysis was used. Correlations between the study variables were explored before the regression analyses by Pearson correlations. The variables to the regression models were chosen on theoretical and statistical basis. The level of statistical significance was set at $p < .05$. The distributions of autonomy support from one's physician, autonomous motivation, trust, and diabetes counseling scales were skewed to the right, and the distribution of patient-centered care scale was skewed to the left but without influence on the analysis. Statistical requirements for normal distribution,

Table 2. Measures used in the study.

Continuity of care	Do you have at the moment in diabetes care (a) a family or regular doctor, (b) a family or regular nurse, (c) a written care plan? 1=no, 2=yes
Importance of continuity of care	How important is it to you to have a family/regular doctor? 1=not at all important, 2=quite important, 3=very important
Access to care	When needed, have you gotten in your current and principal primary care health center quickly enough (a) contact with a doctor by phone, e-mail, or Internet; (b) contact with a nurse by phone, e-mail, or Internet; (c) appointment time to a doctor; (d) appointment time to a nurse; (e) referral to a specialized doctor? 1=almost never, 2=sometimes, 3=most of the time, 4=always
Diabetes counseling	Have you gotten in your current and principal primary care health center information, advice, and guiding on (a) diabetes as a disease, (b) use of diabetes medication ... (o) suitable physical exercise? (15 items, range 1=not at all, 3=enough)
Patient-centered care (CCM)	The 20-item form of the PACIC-scale (The Patient Assessment of Chronic Illness Care; range: 1=almost never, 5=almost always, Cronbach's alpha reliability $\alpha=0.94$). Example item: I was asked for my ideas when we made a treatment plan (Glasgow et al., 2005)
Trust	The 13-item scale measuring trust in health care personnel, (range: 1=fully disagree, 5=fully agree, $\alpha=0.92$). The scale was created for this study and is based on trust scales by Calnan and Sanford (2004), Calnan and Rowe (2006), Van der Schee et al. (2007), Egede and Ellis (2008), Hall et al. (2002), and Laamanen et al. (2006). Example item: I trust the professional expertise of my doctor
<i>SDT variables</i>	
Perceived autonomy support from one's physician (n.d.)	The short 6-item form of Health Care Climate Questionnaire (HCCQ; range: 1=fully disagree, 5=fully agree, $\alpha=0.95$). Example item: I feel that my physician has provided me choices and options (http://www.selfdeterminationtheory.org/)
Autonomous regulation (motivation) scale (n.d.)	Eight items from the Treatment Self-Regulation Questionnaire (TSRQ; range: 1=not at all true, 7=very true, $\alpha=0.86$). Example item: The reason I follow my diet and exercise regularly is that I personally believe that these are important in remaining healthy (http://www.selfdeterminationtheory.org/)

SDT: self-determination theory; CCM: Chronic Care Model.

linearity, and homoscedasticity of regression residuals were fulfilled. Listwise deletion of missing data was used. Analyses were done by SPSS version 23.

Results

Preliminary analysis

Overall access to care was quite good (Table 3). Of the respondents who had needed appointment time to a doctor, 53 percent reported that they had always got it and 29 percent most of the time. The corresponding percentages regarding appointment time to a nurse were 54 and 33 percent. Perceptions on access to a specialist were more polarized: 37 percent had always and 30 percent had never got referral to a specialist quickly enough.

A majority (84%) of the respondents had been over 2 years, and 95 percent at least 1 year, in care in their current and principal primary care health center. In all, 75 percent had a family/regular doctor, and 73 percent assessed it as very important, and 22 percent as quite important. Only to 6 percent it was not important at all. The corresponding percentages regarding the importance of a family/regular nurse were 57, 28, and 15 percent. However, there were a lot of missing cases because a half of the respondents did not

have a family/regular nurse. Only 14 percent of the patients had a written care plan. The means of diabetes counseling, trust, and autonomy support from one's physician were high but lower regarding patient-centered care (Table 3).

Primary analysis

Trust, patient-centered care, and autonomy support from one's physician correlated strongly with each other, especially trust with autonomy support. Diabetes counseling correlated positively with trust, patient-centered care, and autonomy support. Quick access to a doctor correlated positively with trust and autonomy support from one's doctor. Also, having a family/regular doctor correlated positively with quick access to a doctor, autonomy support from one's doctor, and trust. None of the dimensions of primary care quality correlated very strongly with autonomous motivation, but the highest correlations were with autonomy support (0.25, $p<.001$), trust (0.21, $p<.001$), and patient-centered care (0.18, $p<.001$; Table 4).

Because of the strong correlations between trust, patient-centered care, and autonomy support from one's physician, the relative effect of these dimensions compared with other quality dimensions was first analyzed in separate regression models in order to avoid multicollinearity. In the final

Table 3. Descriptive statistics of health care quality dimensions and autonomous motivation (% , mean, SD).

Continuity of care	%/mean (SD)	N
<i>Time in care</i>		
Less than 1 year	4.8	132
1–2 years	10.9	298
Over 2 years	84.3	2307
Total	100	2737
<i>Family/regular doctor</i>		
No	25.5	703
Yes	74.5	2056
Total	100	2759
<i>Family/regular nurse</i>		
No	48.5	1133
Yes	51.5	1205
Total	100	2338
<i>Written care plan</i>		
No	85.8	1783
Yes	14.2	294
Total	100	2077
Overall access to care (range, 1–4)	3.2 (0.8)	1757
Diabetes counseling (range, 1–3)	2.5 (0.5)	2622
Trust (range, 1–5)	3.7 (0.9)	2709
Patient-centered care (range, 1–5)	2.3 (0.8)	2696
Autonomy support (from one's physician) (range, 1–5)	3.6 (1.2)	2704
Autonomous motivation (range, 1–7)	5.6 (1.2)	2757

SD: standard deviation.

regression model, all variables were included. Regression analyses confirmed the results from the correlation analyses showing that autonomy support from one's physician was the best predictor of autonomous motivation for good diabetes care (Tables 4 and 5). This result did not change when the analyses were done separately for men and women, different age groups (under 65 years/65 years or over), and education levels (lower/higher professional education). The only exception was that both autonomy support ($p < .001$) and patient-centered care ($p < .01$) predicted autonomous motivation among the working age respondents (data not shown).

When the five municipalities were analyzed separately, autonomy support was again the best predictor of autonomous motivation except for one of the small municipalities where having a family/regular doctor was a better predictor of autonomous motivation ($p < 0.01$) than autonomy support from one's doctor ($p > 0.05$). The smallest municipality did not have enough respondents for a reliable multivariate analysis (data not shown).

Discussion

This study investigated whether, and how strongly, the central quality dimensions of primary health care (access to care, continuity of care, diabetes counseling, trust, patient-centered care, and autonomy support from one's physician) were associated with autonomous motivation for diabetes self-management among patients with type 2 diabetes. This

Table 4. Pearson correlations between the variables included in the linear regression analyses.

	1	2	3	4	5	6	7
1. Time in care 1 = 2 years or less 2 = over 2 years							
2. Family/regular doctor 1 = no 2 = yes	.03						
3. Quick appointment time to a doctor 1 = almost never 4 = always	.01	.38***					
4. Diabetes counseling 1 = not at all 3 = enough	.04	.14***	.26***				
5. Trust 1 = totally disagree 5 = totally agree	.01	.33***	.50***	.52***			
6. Patient-centered care 1 = almost never 5 = almost always	.00	.19***	.28***	.58***	.57***		
7. Autonomy support (from one's physician) 1 = totally disagree 5 = totally agree	.01	.35***	.44***	.45***	.81***	.57***	
8. Autonomous motivation for diabetes self-management 1 = not at all true 7 = totally true	.03	.08***	.10***	.13***	.21***	.18***	.25***

*** $p < .001$.

Table 5. Single and multivariate linear regression models on determinants of autonomous motivation for diabetes self-management.

Quality of primary care	Beta	Beta	Beta	Beta	Beta
Continuity of care					
<i>Time in care</i>	.03 ns				
2 years or less over 2 years	<i>n</i> = 2655				
<i>Family/regular doctor</i>	.08***	.01 ns	.03 ns	-.01 ns	.00 ns
1 = no, 2 = yes	<i>n</i> = 2664				
Access to care					
<i>Quick appointment time to a doctor</i>	.10***	.00 ns	.04 ns	.00 ns	.00 ns
1 = almost never, 4 = always	<i>n</i> = 2294				
Diabetes counseling	.13***	.04 ns	.04 ns	.03 ns	.01 ns
1 = not at all, 3 = enough	<i>n</i> = 2560				
Trust	.21***	.19***			-.01 ns
1 = totally disagree, 5 = totally agree	<i>n</i> = 2661				
Patient-centered care	.18***		.15***		.06 ns
1 = almost never, 5 = almost always	<i>n</i> = 2644				
Autonomy support (from one's physician)	.25***			.25***	.23***
1 = totally disagree, 5 = totally agree	<i>n</i> = 2654				
<i>N</i>		2085	2066	2083	2037
<i>R</i> ²		.05	.04	.07	.07

Missing values excluded listwise.

ns $p > .05$.

*** $p < .001$.

is an important subject to study because accumulated research evidence shows that behavior change is more likely to occur and last when patients with chronic illnesses are autonomously motivated. Also, respect for patient autonomy has been raised as one of the highest level priorities in health care beside patient welfare and elimination of social injustice (Ng et al., 2012).

As predicted, of the six quality dimensions measured in this study, autonomy support from one's physician, trust, and patient-centered care were most strongly associated with patients' autonomous motivation. The results were similar among men and women and in different age and education groups. However, the detected correlations were not very strong indicating that besides primary health care quality many other factors predict patients' autonomous motivation for effective self-management. Our earlier study (Koponen et al., 2015) showed that the overall support for diabetes care received from friends, family members, other patients with diabetes, and health care professionals correlated more strongly with autonomous motivation (.36, $p < .001$) than patient-centered care, trust, and autonomy support from one's physician (.18-.25, $p < .001$) as found in this study. In addition, motivation and behavior do not depend only on the immediate social context but are a function of the person's inner resources that have developed over time in interactions in various social contexts (Ryan and Deci, 2002). There are personality differences regarding autonomy as well as differences in aspirations and strivings which impact chosen lifestyle and values (Ryan et al., 2008).

Autonomy support from one's physician, trust, and patient-centered care correlated strongly with each other, especially autonomy support with trust. All these variables measure the effectiveness of interpersonal care. The results of this study stress the importance of autonomy supportive health care environment characterized by a sense of security, trust, respect, understanding, and support for competence and autonomy. These results are in line with the predictions of SDT indicating that a sense of relatedness and support for competence and autonomy are important for the internalization of the importance of health behavior change leading to autonomous motivation for effective self-management. A sense of relatedness is seen central for initiating health behavior change, whereas a sense of competence and autonomy are more central for maintaining change (Ryan and Deci, 2002).

In line with the results of Safran et al. (1998), access to care and continuity of care played a smaller role than trust, patient-centered care, and autonomy support from one's doctor. However, access and continuity are essential for a trusting and supporting relationship to emerge. The results showed that having a family/regular doctor correlated positively with trust and perceived autonomy support from one's doctor. Also, quick access to a doctor correlated positively with trust and perceived autonomy support from one's doctor. Good diabetes counseling also played a role by being positively associated with trust, patient-centered care, and autonomy support from one's doctor.

Of the six central primary care quality dimensions, autonomy support from one's doctor was most strongly associated with autonomous motivation for self-management. This stresses the important role of doctors and is in line with previous research (Zolnierek and DiMatteo, 2009). Doctors have the highest authority in diabetes care and they make final decisions concerning care. Therefore, the quality of interaction with one's doctor is extremely important. According to Ryan and Deci (2002), practitioners' general beliefs about patients affect the care strategies they choose. If they believe that people have a natural tendency toward enhancing their human potentials, they will orient to support this tendency. If they have no such belief, they will try to motivate through mere authority or focus on exogenous means of training, shaping, controlling, and directing patients' behavior. Autonomy support may generate better health-conducive behavior and better health outcomes among patients and thus decrease health care costs. In addition, patient autonomy is considered to be a critical health care outcome in its own right (Ng et al., 2012).

The strength of this study was the large number of respondents and the possibility to analyze the association of many central care quality dimensions, recognized in health care research, with patients' autonomous motivation. One limitation of the study was that on the basis of a cross-sectional study, it is difficult to confirm directionality of the hypothesized relations. However, 95 percent of the respondents had been at least 1 year in care in their current and principal primary care health center, and 75 percent had a family doctor or a "regular" doctor. Therefore, it is highly likely that care provided by the doctor and other health care personnel in the health center had influenced patients' autonomous motivation. Another limitation of the study was that we were not able to study separately the influence of nurses on patients' autonomous motivation.

The prevalence of diabetes is expected to rise all over the world especially in low- and middle-income countries (Guariguata et al., 2014). In Finland, the number of diagnosed patients with type 2 diabetes has been doubled in intervals of 12 years, and this trend is likely to continue (Koski, 2011). Motivating patients for good self-management of diabetes is estimated to be one of the greatest challenges of health care (Teixeira et al., 2012b). This study stresses the importance of autonomy supportive health care climate for patients' autonomous motivation. However, the results of this study may not be generalizable to cultures with different values and perceptions of autonomy.

Conclusion

The results of this study gave support to the ideas of SDT suggesting that primary health care climate characterized by autonomy support, trust, and patient-centeredness is able to enhance patients' autonomous motivation for effective self-management of diabetes. However, overall support for diabetes care received from friends, family members, other

patients with diabetes, and health care professionals may even play a greater role in autonomous motivation for good self-management.

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