Research Article

The Development of a Patient-Practitioner Nurse Self-management Questionnaire (PPN-SM-q) to Evaluate Chronic Primary Health Care

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ABSTRACT

Background: Self-management is becoming a major issue in chronic primary health care. Until now, there is poor insight in patients and professional involved aspects, predominantly because properly developed instruments to assess these characteristics are lacking.

Objective: To develop and validate a user friendly self-management questionnaire following a rigorous protocol of scale development.

Methods: After focus groups interviews in both patients (suffering from diabetes, asthma/COPD and cardiovascular disease) and practitioner nurses (PN), an exploratory factor analysis (SPSS-IBM, Oblimin rotation) revealed a 21-item scale with good model fit during Confirmatory Factor Analysis (AMOS-IBM: CFI of 0.94, a NFI 0.96, TLI of 0.95 and a RMSEA of 0.06 with a lower bound of 0.03). Three dimensions were discriminated: a 8-item 'patient-PN interaction sub-scale', a 9-item 'patients self-management attitude sub-scale' and a 4-item 'patients self-management action' subscale with a Cronbach's alpha of 0.87, 0.81 and 0.80, respectively. The sub-scales 'patient-PN interaction' and 'patients self-management action' showed significant correlations in the expected direction with the PHQ-4 (r=-0,11 and -0,20) while the three sub-scales correlated highly significant with the self-efficacy sub-scale: r=0.41,

r=0.27 and r=0.65. A multivariate linear regression with "self-management attitude scores'' as dependent variable and patient-PN interaction sub-scale scores as independent variable (adjusting for demographic variables sex, marital status, education and age, depression/anxiety and self-efficacy scores) showed that high self-efficacy scores (beta=0.48, p<0.001), high PN interaction scores (beta=0.28, P<0.001) and higher education (beta=0.13, P=0.004) were all significantly related to high scores on the self-management attitude scale. A similar regression with "self-management action scores'' as dependent variable showed that only the patient-PN interaction scores (beta=0.48, P<0.001) and higher age (beta=-0.12, P=0.014) were significantly related.

Conclusion: The 21 item patient-practitioner nurse self-management questionnaire consists of three sub-scales measuring relevant aspects of self-management behavior. Adequate patient–PN interaction is an important predictor of adequate self-management. We recommend implementing this instrument in daily primary practice of chronic health care. Poor scores should help to focus both on patient as well as practitioner nurse characteristics that are important for optimal health care.

Keywords: Self-management; Primary chronic care

What do we know?

Because of aging the burden of chronic primary health care increases dramatically. Patients' self-management is an important new aspect of chronic primary health care with an important role of the practitioner nurse. However, little is known about patient and practitioner nurse characteristics relevant to adequate patient self-management behavior. This is mainly to be explained by the few available instruments that are appropriately constructed following a rigorous protocol from focus groups interviews to adequate psychometric testing.

What does this paper add?

The current paper presents a user-friendly 21 item self-rating self-management questionnaire which has been constructed according to the standard rules in social sciences. Focus groups interviews of patients and practitioner nurses, exploratory

and confirmatory factor analyses in large samples resulted in an 21 item instrument consisting of three sub-scales: a 8-item 'patient-practitioner nurse interaction sub-scale', a 9-item 'patients self-management attitude sub-scale' and a 4-item 'patients self-management action' subscale with adequate psychometric characteristics. Adequate patient-PN interaction is independently related to adequate self-management scores. Future research will elucidate whether patients with a chronic disease who have high scores on these sub-scales show adequate self-management behaviour resulting in better outcome and parameters of care.

Introduction

During the last two decades, chronic primary healthcare in the Netherlands has become a major expertise of the primary health care nurse or practitioner nurse (PN). Most of these PN's collaborate with the general practitioner (GP) within chronic health care groups. PoZoB is a health care group in which over 200 GP's and 200 PN's are responsible for the chronic care of over 85.000 patients with a chronic condition (diabetes, asthma, COPD, cardiovascular disease, mental health and frail elderly).[1-4] The chronic patients are predominantly seen on a regular basis one to four times a year by the PN with one consultation by the GP per year (or more often in case of complications). Furthermore the role of the PN is expanding to patient centred case management, which means that the PN is not only important in caring and treating the patient with a chronic condition but also in empowering the patient in self-management. A positive interaction that the patient perceives with the health professional, including the PN, results in better patient outcome.[5] Until now there is little evidence in The Netherlands what the specific role of the PN is in achieving, optimal self-management attitude in the patient, both from a patient as well as the PN perspective. This is partly to be explained while instruments assessing the interaction between the patient and PN and its possible relation with a patient's self-management attitude hardly exist. These instruments should preferentially be developed according to a strict standardized protocol used in social sciences and should go through a process of psychometric and construct validation, preferentially performed in large samples.[6] Moreover, it is well known that the completion of self-reporting questionnaires in general might be biased by patient characteristics, such as patient's mental health, more specifically depression/anxiety. This is the more relevant while co-morbid depression is often seen in patients with chronic somatic diseases.[7] According to the self-management of well-being theory; self-efficacy is important self-management ability. Self-efficacy, a construct derived from the Social Cognitive Theory, is the "belief in one's capabilities to organize and execute the courses of action required to produce given attainments".[8] Therefore, depression and self-efficacy should be taken into account when patients complete a questionnaire to evaluate patient-practitioner nurse interaction. The main outcomes of the current study were therefore: (i) to develop a user friendly self-rating scale assessing patients-practitioner nurse aspects of self-management; (ii) to look at patient determinants of adequate self-management.

Methods

Procedure and participants

Development of the patient-practitioner nurse self-management (PPN-SM) questionnaire: Prior to the construction of the PPN-SM questionnaire, the client advisory board (consisting of six patients with a chronic disease) of PoZoB was consulted to define topics that should be addressed during the focus group interviews. Thereafter four different focus groups were formed. Three groups consisted of five to seven patients with diabetes, asthma/COPD and cardiovascular disease. The fourth group consisted of six PNs. This resulted in a first draft of a questionnaire omitting as little information as possible. Based on the panel's consensus, a total of 57 items were derived from an original sample of 124 candidate questionnaire items for further pilot testing. This first draft was subsequently sent to the participants of the focus group to test whether the content covered the aspects that were discussed during the interviews. The final first draft PPN-SM questionnaire contained 57 statements to which the respondent was asked to answer on a five point scale Likert scale (ranging from 0="totally disagree" to 4 "totally agree"). This first draft was subsequently distributed in 1477 randomly selected patients (age 18-80 years) of the total PoZoB data base of 60.000 patients, taking into account an equal distribution of the chronic diseases: diabetes, asthma COPD, cardiovascular disease (Study I). Patients were invited to complete the questionnaire anonymously. Cases who returned fully completed questionnaires were subsequently randomly split by the computer in two sub-samples IA and IB of 60/40% size of the total sample to achieve sufficient power size for both studies: at least five participants for each newly developed item. Sub-sample IA was used for exploratory factor analysis (EFA), sub-sample IB was used for confirmatory factor analysis (CFA) of the first draft version resulting in a final draft of the questionnaire. Thereafter, a second project was performed (Study II) in which another sample of 1000 patients (who did not participate in study I) was randomly selected from the PoZoB data base (with similar distribution of chronic diseases) to further test the final draft version of Study I and to assess construct validity of the PPN-SM questionnaire.

Validation of the self-efficacy life style questionnaire: SELS Based on the self-efficacy elements as defined by Bandura, we previously developed a self-efficacy quit smoking questionnaire with good psychometric properties and construct validity.[9,10] We subsequently adapted this scale for self-efficacy assessment in chronic patients with diabetes who were offered an exercise program to improve health quality,[11] combining it with items of the 18-item Exercise Self-efficacy Scale developed by Bandura.[10,12] This resulted into a 13-item scale with one factor solution and good psychometric properties.[12] In the current study, we further adapted and validated this scale to evaluate the patient's capabilities of self-management aspects, with special focus on the patients' belief to execute the life-style changes that were advised by the PN: the self-efficacy life style questionnaire (SELS). This adapted self-efficacy scale was subsequently used for construct validation of the self-management questionnaire. The questionnaire was adapted to the current study modifying the questions with regard to 'confident to follow the advices of self-exercise' into 'confident to follow the advices of changing life-style in general'. This resulted in a six item short self-rating scale which was further tested in study I using EFA (sub-sample IA) and CFA (sub-sample 1B).

Construct validity: Both the PPN-SM as well as the SELS were further validated in Study II using the PHQ-4 (Patient Health Questionnaire-4 items) which has been extensively validated in primary care.[13] The PHQ-4 assesses two main symptoms of depression and two main symptoms of general anxiety. Moreover, the EQ-5D (EQ 5D Health-Related Quality of life questionnaire) was assessed to evaluate perceived quality of life.[14] The design of the study is shown in Figure 1.

Statistics

Statistical analyses were performed using the Statistical Package for Social Sciences, version 24. The confirmatory factor analysis was done using AMOS.

In sub-sample IA, a principal component EFA was performed (Oblimin rotation) on the 57-item PPN-SM and the SELS for testing
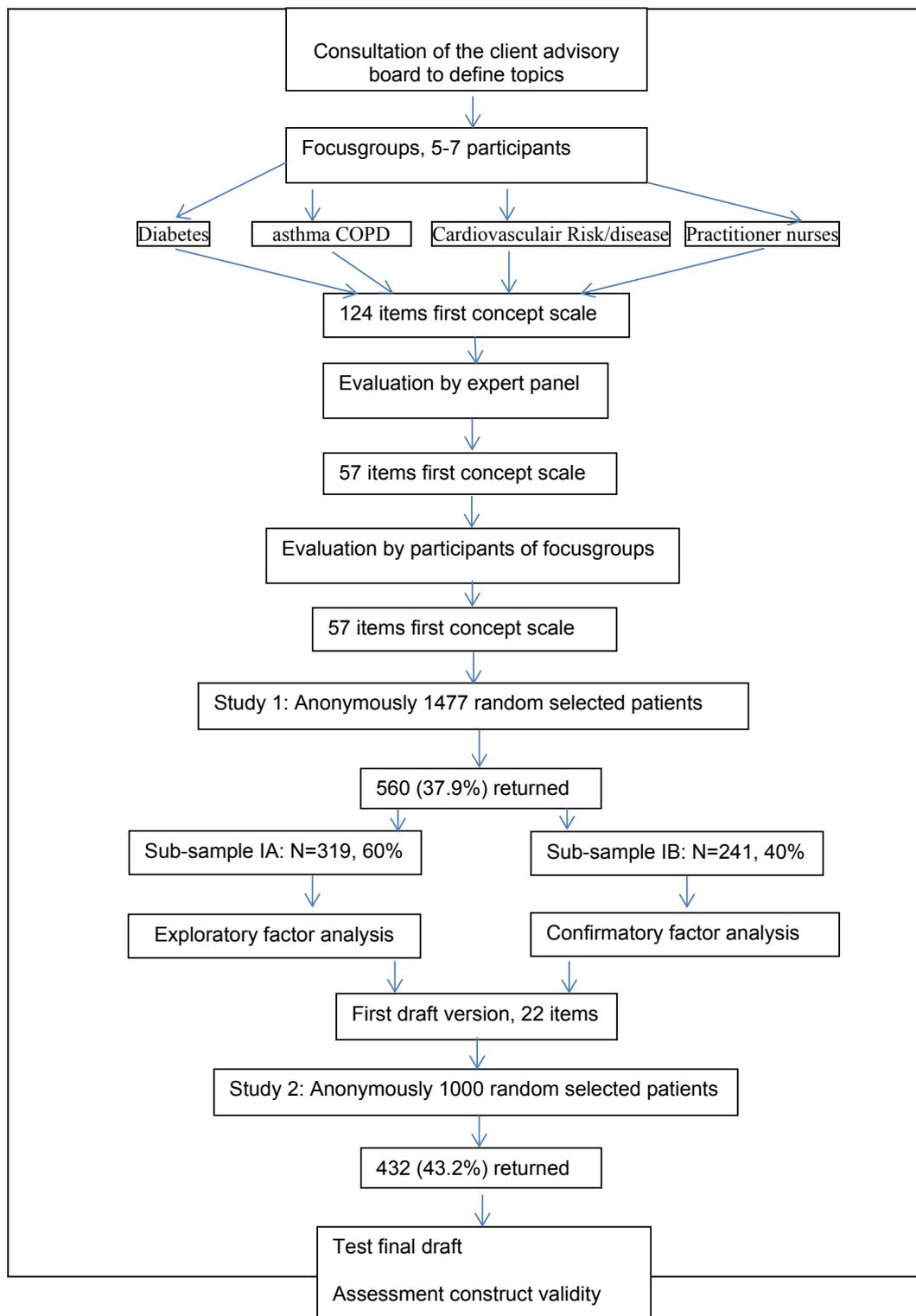
Figure 1: Flow chart procedure development of the questionnaire.

the psychometric properties. A Catell scree plot was used to select factors for retention. Factor loadings >,40 were considered important. Items that did load on more than two factors were retained when the difference was at least 0,20. As explained by Tabachnick and Fidell, a sub-scale of less than 3 items is not desirable.[6] Internal consistency analyses were conducted using Cronbach's alpha for the total scale and possible subscales derived from factor analysis. Cronbach's alpha reliability statistic of ≥ ,70 is considered as the minimum acceptable criterion of instrument internal reliability.[15] In sub-sample IB of study I, a CFA was performed on the (remaining) items of the (second) version

of the PPN-SM scale. The CFA was used to test the model fit of the factor structures found with EFA, assessing the comparative fit index (CFI), normed fit index (NFI), Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). Adequate model fit can be assumed with a CFI ≥ ,80, combined with a NFI ≥ ,80, TLI ≥ ,80 and a RMSEA ≤ ,05 for good and ≤ ,08 for adequate fit.[16,17] To test for differences of characteristics between the two sub-samples, χ^2 analyses were used for all dichotomous data. Differences in mean scores between sub-sample IA and IB in study 1 were analyzed using t test (two-tailed). Study II was used for construct validity analysis.

Construct validity

Subsequently, similar analyses were performed to compare the characteristics of study I and II. In study II, construct validity of the PPN-SM was tested by correlating it with the SELS. Moreover, a possible effect of mood/anxiety problems in completing these new scales was investigated by correlating with the PHQ-4 (Pearson's r correlations, two-tailed). Because large samples easily result in significant correlations, the effect size of the r coefficient was calculated according to Cohen's d. An r of 0,17 represents a low effect size, of 0,35 a medium and >0,50 a large effect size. Only medium to large effects sizes are regarded as clinically relevant. We finally performed multivariate linear regression analyses to investigate an independent effect of several patient characteristics (including depression, anxiety and self-efficacy) on PPN-SM scores (dependent variable).

Results

Study I

The PPN-SM questionnaire: Of the 1477 participants that were invited to complete the 57-item questionnaire, 560 (38%) returned completed questionnaires. Therefore, data-analysis of study I refer to this sample of 560 which was randomly split by the computer in a 60/40% ratio leaving 319 participants for the EFA in sub-sample IA and 241 participants for a CFA in sub-sample IB. In Table 1, the characteristics of these two sub-samples show that they had rather similar characteristics.

One item with a Kurtosis of 4,2 was omitted. The EFA with oblimin rotation showed five dimensions with an Eigen value >1 of the 56 item first PPN-SM draft (although the scree Catell plot suggested only three factors). Total explained variance was 41%. However, there were 13 items who did not load (loading<0,40) and 12 items who did not discriminate between the different dimensions (loading on more than one dimension with a difference of <0,20). These 25 items were omitted. This resulted in a 31 items scale with again five dimensions explaining 52% of variance with an Eigen value of: 8,4 (13 items), 3,2 (6-items),

2,1 (3-items), 1,7 (4 items), 1,4 (5 items). However, the 3 item sub-scale showed an alpha Cronbach of 0.57. Therefore, the EFA was repeated with a 4-factor solution for a 28-item PPN-SM draft version. This 4-factor model was subsequently tested by a CFA in sub-sample IB of study I and showed a poor model fit. Therefore, the 28-item PPN-SM version was again tested in sub-sample IA by EFA using a 3-factor solution. There were 7 items that did not discriminate between the dimensions and these were omitted resulting in a final 3-factor model of 21 items as shown in Appendix. The total explained variance was 50% with three dimensions of 8 items (Eigen value of 6,3), 9 items (Eigen value of 2,5) and 4 items (Eigen value of 1,6). Looking at the face validity of the items the 8–items sub-scale was defined as: 'quality of interaction between patient and PN'; the 9-item subscale as: 'self-management attitude' and the 4-item sub-scale: 'self-management action'. Reliability analysis revealed a Cronbach's alpha of 0,87, 0,81 and 0,80, respectively. When this final 3 dimension 21 item PPN-SM scale was tested by CFA in sub-sample 1B of study I, a good model fit was found with a CFI of 0,94, a NFI 0,96, TLI of 0,95 and a RMSEA of 0,06 with a lower bound of 0,03. This final 21-item draft was subsequently tested again in study II for construct validity.

The self-efficacy life style questionnaire (SELS): The 6-items SELS was also tested in sub-sample IA of study I by EFA and showed a one-factor solution with an Eigen value of 3,2 and 54% explained variance as shown in Appendix. The scale showed a Cronbach's alpha of 0,83. When we tested this scale in sub-sample IB by CFA we found an excellent model fit with a CFI of 0,95, a NFI 0,97, TLI of 0,97 and a RMSEA of 0,05 with a lower bound of 0,02. This 6-item draft was subsequently tested again in study II for construct validity.

Study II

In study II, another random selected sample of 1000 patients of the PoZoB data base, returned 432 fully completed questionnaires. The characteristics of this sample are shown in Table 1 and were similar to (the two sub-samples of) study I. Dimension structure and reliability testing.

Table 1: Characteristics of the participants in sub-sample 1A and 1B in study 1 and of the participants in study 2.

	Study 1 N=560					Study 2 N=432	
	Sub-sample 1A	Sub-sample 1B				Study 2	
	Patients, N=319 (60%)	Patients, N=241 (40%)				Patients, N=432 (100%)	
	N (%)	Mn (SD)	N (%)	Mn (SD)	χ^2	t-test	N (%)	Mn (SD)
Demographic features								
Female sex	147 (46.1)		112 (46.5)				208 (50)	
Age					2.32			
≤ 50	16 (5.0)		1 7(7.1)				31 (7.2)	
51-65	104 (32.7)		74 (30.7)				143 (33.1)	
66-75	149 (46.9)		105 (43.6)				189 (43.8)	
≥ 76	49 (15.4)		45 (18.7)				69 (16.0)	
Marital status, relation	281 (88.9)		217 (90.0)				341 (79.1)	
Educational level								
Low	103 (33.0)		97 (40.4)		3.42		166 (38.7)	
middle	135 (43.3)		89 (37.1)				170 (39.6)	
High	74 (23.7)		54 (22.5)				93 (21.7)	
Life style								
Smoking	37 (11.6)		24 (10.0)				54 (12.5)	
Alcohol (>7 glasses/w)	82 (24.5)		56 (21.8)				86 (18.5)	
BMI		27.22 (4.6)		27.19 (4.2)		p=0.126		27.33 (4.5)

PPN-SM questionnaire: A descriptive statistic showed a normal distribution of all 21 items. The factor structure was tested with EFA with varimax rotation and showed clearly a 3-dimension solution explaining 62% of total variance with Eigenvalues of 8,1, 2,9 and 2,0 for the 8-item ('quality of interaction between patient and PN'), the 9-item ('self-management attitude') and the 4-item ('self-management action') subscales, respectively. The Cronbach's alpha of these sub-scales were: 0,93, 0,86 and 0,89. In Table 2, the mean scores and range of the total PPN-SM scale and it three sub-scales are shown. The scores were normally distributed.

Self-efficacy lifestyle questionnaire: EFA with varimax rotation showed a one-dimension solution with an Eigen value of 3,7 explaining 61% of variance, the Cronbach alpha was 0,87.

Construct validity

The newly developed questionnaire was correlated with previously validated questionnaires for construct validity. It should be remembered that the higher the scores on these new scales, the higher the PN interaction, the more positive feelings toward self-management attitude and action and the higher the self-confidence of the patient for self-management. The PHQ-4 and the EQ-5D have the opposite direction: the higher the scores, the higher depressive/anxiety symptoms and the poorer health quality are perceived. A simple reliability analysis of the PHQ-4 revealed a Cronbach alpha of 0,87, while this was very poor for the EQ-5D: 0,50. Further exploration of the latter scale showed that when the mood and pain symptoms questions of the EQ-5D were omitted, the alpha increased to 0,60 but was still inappropriate. Therefore we did not include the EQ-5D in further analyses.

The following hypotheses were formulated: the sub-scale 'quality of interaction between patient and PN', 'self-management attitude' and the 4-item sub-scale: 'self-management action' will correlate positively with the scale self-efficacy, while scores on all these scales will be negatively affected by PHQ-4 scores. In Table 3, the correlations are shown between all these scales. As can be seen, the sub-scales of the PPN-SM inter-correlated all significantly with a medium effect size. However, the r² – explained variance – of these correlations varied between 10–25%, suggesting that these subscales assess different aspects relevant to self-management. The self-management sub-scale 'action' correlated very high (0,65) with the self-efficacy scale. The self-efficacy scale correlated negatively with the PHQ-4 but the r coefficients showed a rather low effect size (–0.16).

Because of the importance of self-management in future chronic health care, we finally performed two multivariate linear regression analyses. One with "self-management perception scores" as dependent variable and one with "self-management action scores" as dependent

Table 3: Pearson correlation (r, two-tailed) between the total patient-practitioner nurse self-management scale (PPN-SMtot) and its sub-scales: the patient-practitioner nurse interaction subscale (PPN-I), the self-management-*attitude* subscale (SMAT) and the self-management *action* subscale (SMAC), the PHQ4 and the self-efficacy scale, N=432.

	PPN-SMtot	PPN-I	SMAT	SMAC	phq4	Self-efficacy
PPN-SMtot		0.81**	0,76**	0,88**	-0,11*	0,41**
PPN-I			0.48**	0.43**	-0.12*	0.21**
SMAT				0,33**	-0,005	0.27**
SMAC					-0.20**	0.65**
phq4						-0.16*

*: P<0.05; **: P<0.001

variable. The independent variable in both regressions was the patient-PN interaction sub-scale scores. Preliminary analyses showed no violation of the assumption of normality, linearity, multicollinearity and homoscedasticity.[18] We adjusted for demographic variables sex, marital status, education and age, but also for depression/anxiety and self-efficacy scores. High self-efficacy scores (beta=0,48, p<0,001), high PN interaction scores (beta=0,28, p<0,001) and higher education (beta=0,13, p=0,004) were all significantly related to high scores on the self-management attitude scale with a total explained variance of 45% (F=55, P, 0,001). Self-efficacy contributed 30% of variance and the patient-PN interaction scores 12% of variance. Depression/anxiety scores (PHQ-4) were negatively related to management perception scores, however the beta was low (-0,08) and the P was modest (0,039) with low effect size. Age, sex and marital status were not related to high scores of self-management attitude. When we repeated this analysis with "self-management action scores" as dependent variable, there were only two parameters significantly correlated: the patient-PN interaction scores (beta=0,48, P<0,001) and higher age (beta=-0,12, p=0,014). The total explained variance of this model was 24% (F=54, p<0,001) with no effect of all the other confounders (sex, self-efficacy, depression/anxiety, education and marital status). The patient-PN interaction scores contributed 23% of the explained variance.

Discussion

The current study shows, that after a rigorous protocol of scale development – including focus groups interviews, exploratory and confirmatory factor analysis in large samples – a 21 items user friendly patient practitioner nurse self-management questionnaire was developed with appropriate psychometric characteristics. This scale consists of three dimensions: an 8-item scale assessing patient – practitioner nurse interaction; a 9-items sub-scale assessing the patient attitude towards self-management; and a 4-item sub-scale assessing the willingness of a patient to contact the PN in case of troubles: self-management action. Moreover, the current study demonstrated a robust short questionnaire to assess patient's self-efficacy reflecting his confidence in following PN life style advices. As far as we know this paper is among the first presenting a primary care self-management questionnaire assessing aspects which are relevant to self-management, from a patient as well as a PN perspective. The dimensions of this PPN-SM-q are very interesting. At the start of the focus group interviews, the only direction that the researchers gave to the participants was: "what do you think are important aspects of self-management?" Apart from "concepts" of self-management, the patients (which was confirmed by the PN) spontaneously came up with issues of: patient – PN interaction. When we look at the patients – PN interaction sub-scale, it seems crucial for patients, the way they feel treated them by the PN. "I feel confident with the PN", 'It is important that we discuss our

Table 2: Mean scores (SD) of the total patient-practitioner nurse self-management scale (PPN-SMtot, 21 items), the patient-practitioner nurse *interaction* subscale (PPN-I, 8 items), the self-management-*attitude* subscale (SMAT, 9 items), the self-management *action* subscale (SMAC 4-items), the 6-item self-efficacy life style scale and the PHQ-4, (N=432).

	Minimum score	Maximum score	Mean	Std. Deviation
PPN-SMtotl	7	80	56,86	11,06
PPN-I subscale	0	32	23,58	5,51
SMAC subscale	0	16	9,50	3,97
SMAT subscale	3	32	23,80	4,56
Self-efficacy	5	25	18.70	3.20
PHQ-4	4	16	5.61	2.43

health check results together', "when I am in trouble the PN responds in a nice way". The two other dimensions of the PPN-SM scale seem to be more directly related to aspects of self-management. First, the patient's attitude towards self-management about becoming more and more responsible for management of his own health care. Secondly, if there are some problems/questions, does he indeed undertake action? This resulted in the self-management action sub-scale. Although we did not have a golden standard to validate these sub-scales, it is interesting to see that there is a high correlation (0,65. r^2=0,42, high effect size) between the self-management action sub-scale and the self-efficacy scale. People with a strong belief: "in one's capabilities to organize and execute the courses of action required to produce given attainments",[8] also answer that they will undertake action when they have question or are in trouble with regard to their chronic condition. The fact that self-efficacy have a modest correlation with the self-management attitude sub-scale suggests that assessing this attitude is a different concept of actually looking for help. The moderate to high correlation between the self-management attitude sub-scale (0,48, r^2=0,26, medium effect size) and the patient-PN interaction sub-scale suggests that a trustful and confident interaction will influence the patients attitude towards self-management. Looking at the face-validity of some interaction items, this seems logical. A patient's experience that he/she is involved in decision making regard his own care, will positively influence the attitude that he/she has to be more and more involved in self-management. These findings were confirmed in a multivariate linear regression analysis. After adjustment for several confounders including age, sex, education, self-efficacy, marital status and depression/anxiety, the interaction between the patient and self-management attitude and action scores PN scores were predominantly explained by high self-efficacy and a positive interaction between the patient and PN. This suggests that an adequate self-management behavior of the patient is substantially and independently influenced by the interaction between the patient and PN. Interestingly, in both regressions, patients depression/anxiety scores were not (clinically relevant) related to both self-management attitude and action sub-scale scores. In The Netherlands, previously a self-report instrument to measure Self-Management Ability (the SMAS-30) in aging individuals has been developed.[19,20] However, this scale consists of items that were formulated by a panel of experts. No focus groups interviews with patients or practitioner nurses were performed which means that it is actually difficult to evaluate whether these items are really important in self-management from a patient prospective. Interestingly, in the same study, the SMAS-30 was validated against a self-efficacy scale.[20] However, a close look at several items on the self-efficacy scale in this study reveals items that are not typical for the concept "of belief in one's capabilities to organize and execute the courses of action required to produce given attainments".[8] Items such as "are you able to have friendly contacts with others" or "are you able to let others know that you care about them" seem more closely related to social support or social interaction aspects.[20] Another study from The Netherlands investigated different aspects relevant to maintain overall well-being. They also demonstrated an important role of perceived professional-patient interaction in self-management although this interaction in some chronic patients did not fully protect against the deterioration of self-management abilities.[21]

Strength of the current study is the rigorous protocol of scale development that has been followed: starting with the client advisory board to focus groups interviews with patients and PN followed by exploratory factor, reliability analyses and confirmatory factor analysis in two different, but comparable, samples of largely sufficient sizes. A limitation of the study is that there exists no golden standard to validate these new scales which leaves the question open: what are we currently assessing? Future research is needed to correlate scores on these new (sub)scales with standardized interviews to evaluate whether indeed aspects of self-management are assessed. What is the possible implication for future research and daily practice? It will be important to evaluate whether patients with poor scores on the PPN-SM questionnaire will also have poor outcome with regard to "hard core" parameters of heath care (blood pressure, lipid spectrum, glucose). But also, and perhaps even more important, whether these scores will also predict process parameters. Do patients with low scores on this scale also have poorer attrition to health care with regard to drug intake, regular appointments with the PN (and the GP!) and life style changes such as smoking habits, alcohol intake and overweight reducing measures? Therefore, the next step within our primary chronic healthcare organization PoZoB will be to implement the use of this questionnaire in daily practice and to evaluate over time whether poor treatment and process outcome can be predicted by poor scores on these newly developed scales. Also, PoZoB will implement these scales in regular care to evaluate the functioning of the PN with regard to patient – PN interaction. Those PN who have patients with poor scores will be offered further training in order to improve patient–PN interaction.

Conclusion

The patient-practitioner nurse self-management scale is a short, user friendly self-rating scale consisting of three sub-scales assessing different aspects of self-management. We recommend primary health care organizations to implement this instrument in daily primary practice of chronic health care. Poor scores should help to focus both on patient as well as practitioner nurse characteristics that are important for optimal health care. Moreover, the scores outcome could be used in education and training programs of PN before treating chronic patients.

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