A Team Level Perspective for Patient Adherence Promotion- Development and Initial Validation of a Short Scale for Measuring the Nursing Team Functioning

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Abstract

Based on previous research that point to the need in tailoring specific solutions to the individual patient, and on the value of teamwork for quality of care, the current paper suggests a team level approach for coping with the persistent problem of insufficient patient adherence. Furthermore, a short scale for assessing the nursing team's patient adherence promotion and its initial validation are presented. As was expected, analysis of variance in a sample of 1001 nurses show that primary healthcare nursing teams, scored significantly higher than nurses from three other healthcare settings (hospitals, retirement homes, and daycare facilities). Further, a CFA with the items of this scale and the items of an established patient satisfaction scale pointed to a better fit of two factors model over one factor model. Last, in a second sample that includes 962 nurses we found an indirect effect of the nursing team's agreeable communication style on the team's patient adherence promotion that is partially mediated by team reflexivity.

Keywords*: Patient adherence; Teamwork; Patient satisfaction; Patient safety; Scale development*

Introduction

Insufficient adherence to treatment regimens is a widespread and persisting problem, and the efforts of the care giving system to promote patient adherence are obviously far from reaching the target. Thus, substantial numbers of patients do not benefit from the medical treatment, resulting with poor health outcomes, and increased health care costs (Cutler & Everett, 2010; Levesque, Li, & Pahal, 2012; Osterberg & Blaschke, 2005; van Dulmen et al, 2007).

The importance of team's work for improving healthcare quality is well recognized (Bohmer, 2013; D'Amour et al, 2008; Manser, 2009; Kalisch, & Lee, 2010; Schmutz, & Eppich, 2017). However, this insight has not yet been applied to the endeavor of promoting patient adherence, and there is lack of research concerning the advantages of caregivers' team effort to promote patient adherence in compare with the individual caregiver's.

An important conclusion made by researchers is that the barriers to patient adherence are complex and varied, and therefore solutions to improve patient adherence must be tailored to the individual patient's needs (Cutler & Everett, 2010; Kardas, Lewek, & Matyjaszczyk, 2013; Vermeire, Hearnshaw, Van Royen, & Denekens, 2001). It seems that a team effort of the caregivers maximizes the possibility of successfully tailoring the medical regiments to the individual patient. The team, rather than the individual caregiver, has a better capacity for recognizing possible obstacles faced by the specific patient to adhere medical regime and for initiating proper solution to these obstacles.

First, the healthcare team in compare with the individual caregiver is exposed to more sources of relevant information regarding the patient prospect to adhere with different medical regiments. For example, different team members may get to interact with different family

members and learn about the patient's background, or may have better understanding of relevant cultural values and norms. Integrating the information each team member has may assist to better assessment of the specific patient's prospect to successfully manage different medical regiments. This combined information seems important for both diagnosing possible obstacles in the patient adherence, and for tailoring suitable solutions. When the healthcare team discusses and integrates relevant information, and reflects over possible obstacles in achieving the patient adherence, it may yield better solutions than a single caregiver.

Thus, beyond the patient- single provider interaction, the functioning of the healthcare givers as a team in regard with patient adherence promotion seems important, and given the poor health outcomes, and increased health care costs of non-adherence, it is important to investigate the team level functioning in this respect.

However, for promoting this line of research, there is a need in developing a measure to evaluate the construct of "team adherence promotion". Hence, the current research aims to present a short scale for measuring this construct and its initial validation among nursing teams. The important role of the nurse in promoting patient adherence has been well recognized (Koelewijn-van Loon et al., 2008; Jayasinghe, 2009). Moreover, nursing a patient often involves extensive interaction with the patients and their families. Therefore, the nursing team is exposed to valuable information relevant to the patient prospect to adhere to different medical regimens, and may have an important role in patient adherence promotion.

We further suggest that the functioning of the nursing team as a whole in regard with promoting patient adherence is dependent on the team communication style with more agreeable communication fosters knowledge sharing and team reflection (De Vries, Van den Hooff, & De Ridder, 2006; Schmutz, & Eppich, 2017).

Methods

This is a cross sectional study conducted among two samples of Israeli nurses. Participants' characteristics are described in Table 1.

For developing a short, "friendly user" unidimensional scale for evaluating the nursing team's patient adherence promotion we followed the subsequent steps: 1) Items generation, 2) Testing for face validity, 3) Testing for construct validity, and 4) Testing for discriminant validity.

First, based on the research literature, and on interviews conducted with 20 healthcare professionals including nurses, nurse leaders, and physicians from various healthcare settings, we generated several items using a Likert-type scale (from 1 = very strongly disagree to 7 = very strongly agree). The items refer to: 1) Perceiving patient adherence promotion as a central responsibility of the team. 2) The level of the team's engagement with identifying barriers to patient adherence. 3) The level of the team's involvement in assisting the patient to overcome barriers to adherence. 4) The overall team's contribution to patient adherence (The items are detailed in Appendix 1).

Second, for testing the items **face validity** we introduced it to a forum of 25 nurses that confirmed its appropriateness.

Third, for testing the resulted scale's **construct validity** we administered it to a sample of nurses (N= 1001) from different healthcare settings (primary healthcare clinics, hospital wards, retirement homes, and daycare facilities) with the expectation that the primary healthcare nursing teams will over score nursing teams from the other settings due to the greater emphasize patient adherence promotion receives in primary health care.

For testing the scales' **discriminant validity** we used an established scale of other aspect of nursing team functioning: patient's satisfaction promotion.

Patient satisfaction promotion was measured with a 5-items scale (Likert-type scale from 1 = very strongly disagree to 7 = very strongly agree) that evaluates the extent to which the nursing team contributes to patients satisfaction in terms of meeting patients' expectations

for agreeable, responsiveness and timely care (Gainey & Klaas, 2003). A sample item is: "This nursing team provides the patients a high level of satisfaction" (the items are detailed in Appendix 1).

Last, for testing our hypothesis regarding the indirect effect of the nursing team agreeable communication style on team promotion of patient adherence mediated by team reflection we used the following measures with an addition sample (N= 962).

Team agreeable communication style- A four-item scale (De Vries, Van den Hooff, & De Ridder, 2006) consisted of the adjectives patient, kind, sympathetic, and friendly. A sample item is: "The communication in this team is sympathetic". Cronbach's alpha reliability (as reported in Table 2) for this scale was 0.76.

Team reflection- A five-item scale drawn from Edmondson's team learning behavior scale (1999) that refer to team reflection. A sample item is: "In this team we regularly take time to figure out ways to improve our team's work process." Cronbach's alpha reliability (as reported in Table 2) for this scale was 0.89.

The nurses were approached by research assistants after receiving the permission of the head nurses. The participation was voluntary. The questionnaire was anonymous, and discretion was guaranteed.

Results

1. Study populations' characteristics

As seen in table 1, Sample 1 included 1001 nurses, 679 from hospital wards, 162 from retirement homes, 111 from primary healthcare clinics, and 49 from day care facilities. About two thirds (70.6%) were women, the mean age was 37.86 years (SD=9.27), and their mean tenure in nursing was 13.2 years (SD= 9.13).

Sample 2 included 962 nurses: 541from hospital wards, 256 from retirement homes, 121 from primary healthcare clinics, and 44 from day care facilities. About two thirds (66.7%) were women, the mean age was 36.11 years (SD=9.69), and their mean tenure in nursing was 10.93 years (SD= 8.88).

Table 1: Study participants' characteristics

		Sample 1 (N=1001)		**Sample 2 (N= 962)**	
Variable	**Category**	**N**	**%**	**N**	**%**
Healthcare setting	Hospital wards	679	67.8	541	56.2
	Retirement homes	162	16.2	256	26.6
	Primary healthcare clinics	111	11.1	121	12.6
	Day care	49	4.9	44	4.6
Gender	Female	707	70.6	642	66.7
	Male	294	29.4	320	33.3
		Mean	**SD**	**Mean**	**SD**
Age	Hospital wards	38.4	9.01	35.65	9.34
	Retirement homes	36.01	9.83	35.03	9.25
	Primary healthcare clinics	38.83	9.82	40.15	10.84
	Day care	34.32	8.24	37.07	10.63
	Total	**37.86**	**9.27**	**36.11**	**9.69**
Nursing Tenure	Hospital wards	13.27	9.05	10.39	8.43
	Retirement homes	12.57	9.15	9.78	8.18
	Primary healthcare clinics	15.54	9.69	15.31	10.73

	Day care	8.9	7.21	12.85	9.72
	Total	**13.2**	**9.13**	**10.93**	**8.88**

2. Validity tests

A. Face validity

The professional forum validated four items (presented in Appendix 1) as relevant to the construct of nursing team's patient adherence promotion.

B. Construct validity

The Cronbach's Alpha reliability for the patient adherence promotion scale in this sample was 0.87.

A one-way ANOVA for the effect of organization type (primary healthcare clinics, hospital wards, retirement homes, day care facilities) on the construct measured by the scale was conducted. As was expected, this analysis yielded a significant ($p<0.001$) effect of organization type, meaning that nursing teams from the different healthcare settings scored differently on this scale. A post hock contrast analysis show that the primary healthcare nursing teams scored significantly higher than the nursing teams from each of the three other healthcare settings: hospital wards ($p< 0.004$), retirement homes ($p< 0.000$), and day care ($p< 0.011$).

C. Discriminant validity - Patient satisfaction

For testing for discriminant validity a confirmatory factor analysis (CFA) for the items of the scales of the two nursing team's functioning aspects- patient satisfaction and patient adherence promotion was performed. As was expected the CFA yielded a better fit for two factors model (AIC= 428.339) over one factor (AIC= 592.111). Further, as seen in Table 2, the two factors model revealed excellent fit to the data (CFI=0.93, RMESA=0.12). These results point to the distinctiveness of the two constructs.

Table 2: Results of confirmation factor analysis

NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI	GFI	RMSEA	AIC
.925	.896	.930	.902	.929	.918	.121	428.339

D. Indirect effect of the nursing team agreeable communication style on team promotion of patient adherence mediated by team reflection

Descriptive statistics

As can be seen in Table 3, high mean scores were reported for all research variables (on a scale of 0-7), as well as positive significant correlations between each pair of them.

Table 3: Research variable means, standard deviations, inter-correlations, and scales' reliabilities

Research variables	**Mean#**	**SD**	**1**	**2**	**3**	**4**
Team patient adherence promotion	5.24	.997	*.87*			
Team agreeable communication style	5.20	1.40	.34**	*.76*		
Team reflection	4.80	1.10	.43**	.41**	*.89*	

Healthcare setting (primary care versus others)	-----	-----	.15**	.13**	.14**	1

Scale 1-7 * p< 0.05 **p< 0.01

Hypothesis testing

Table 4: Indirect effect of the nursing team agreeable communication style on team patient adherence promotion mediated by team reflection

STEP 1: Team Reflection *R=.42*					
	Estimate	***S.E.***	***P value***	***LLCI***	***ULCI***
Nursing team communication style	.318	.025	.000	.268	.367
Healthcare setting (primary care versus others)	.305	.111	.006	.086	.523
STEP 2: Team Patient Adherence Promotion *R=.46*					
	Estimate	***S.E.***	***P value***	***LLCI***	***ULCI***
Nursing team communication style	.142	.024	.000	2.417	3.110
Team reflection	.288	.031	.000	.228	.349
Healthcare setting (primary care versus others)	.265	.010	.008	.070	.461
STEP 3:					
	Effect	***BootSE***	***BootLLCI***	***BootULCI***	
Indirect effect of the nursing team agreeable communication style on team patient adherence promotion	.092	017	.063	.128	

For testing the hypothesis regarding the indirect effect of the nursing team agreeable communication style on team promotion of patient adherence mediated by team reflection we used SPSS PROCESS, Model 4 (Hayes, 2018) with organization type (healthcare setting) serving as a control variable (primary healthcare versus others).

As seen in Table 4, there was a significant effect of the nursing team agreeable communication style on team reflection (B=.318, [LLCI=.268, ULCI=.367]).

Second, there was a significant effect of team reflection (B.288, [LLCI=.228, ULCI=.349]) on the nursing team promotion of patient adherence.

Last, there was a significant indirect effect of nursing team agreeable communication style on team promotion of patient adherence mediated by team reflection (B=.09, [LLCI=.06, ULCI=.13]). However, there was also a significant direct effect of team agreeable communication style (B=.142, [LLCI=2.417, ULCI=3.110).

Conclusions

The widespread and persisting problem of insufficient adherence to treatment regimens requires advancing new approach for promoting it. The current paper presents a team level approach for promoting patient adherence. Further, a short scale for measuring nursing reported team patient adherence promotion was developed. The current results support the validity of this scale. In addition to the scale face validity, it was found that primary health care nursing teams scored higher in this scale than nursing teams from other healthcare settings, supporting scale construct validity. Further, this scale was found to measure a construct that is distinct from patient satisfaction promotion. Using this scale, it was also found that agreeable team communication style has an indirect effect (as well as a direct effect) on the nursing reported

team's functioning in relation to patient adherence promotion mediated by team reflection. Agreeable communication style supports team reflexivity and thus contributes to the team's functioning in regard with patient adherence promotion.

To overcome the limitation of relying on reported functioning, we suggest that future research may test the effect of the adherence promotion nursing team's measured functioning on different measures of actual patients' adherence. A longitudinal design may provide further support for the indirect effect of the communication style on the team's patient adherence promotion that was found in the current study.

Further, other nursing team characteristics, such as the team psychological safety and proactive motivation may be tested as possible antecedents for the nursing team's patient adherence promotion (Kessel, Kratzer, & Schultz, 2012; Parker, Bindl, & Strauss, 2010). Also, the intervening role of the quality of the physician-nursing team communication and collaboration seems a valuable research direction. Likewise, future research may also refer to the perception and actual functioning of interdisciplinary healthcare teams in relation to promoting patient adherence.

The current scale can be used by head nurses to evaluate the nursing team and encouraging this important aspect of nursing team performance.

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Appendix 1: Items of the scale for patient adherence promotion and of the two scales that used for discriminant validity

Patient satisfaction promotion (Gainey & Klaas, 2003):
Our patients feels that the attitude of the nursing team is plessant
This nursing team provides the patients a high level of satisfaction
Our patients feels that this nursing team provides quality services in a timely manner
This nursing team makes a genuine effort to meet patients' needs
Our team meets the patients' expectations
Patient adherence promotion:
Increasing patients' adherence* is a major part of this nursing team's job
This nursing team tries to identify possible difficulties that might raise with patient adherence*
This nursing team does a lot to assist patients overcoming obstacles that might raise in regard with their adherence*
This team significantly contributes to the patients' adherence*

**for hospital wards we added the phrase "after the release"*