

Original Article

Evaluation of patients' topical treatment adherence, psychosocial impact, satisfaction with disease control and disease knowledge among patients with psoriasis vulgaris: a pilot study in Hong Kong

評估銀屑病患者的局部治療依從性、心理影響、銀屑病控制滿意度和疾病知識：在香港的初步研究

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Objectives: The aims of the study were to evaluate patients' topical treatment adherence, psychosocial impact, satisfaction with disease control and disease knowledge among patients with psoriasis vulgaris in Hong Kong. More importantly, the relationship between adherence and factors that influence adherence in patients with psoriasis in our local setting was assessed. **Methods:** This was a cross-sectional descriptive study performed in two public dermatology centres. Adult patients with psoriasis vulgaris were invited for the study. **Results:** A total of 119 patients completed the study. Overall, 31 subjects (26%) adhered and 88 subjects (74%) did not adhere to topical treatment. The adherent group was >50 years old, retired and had disease onset after 40 years old. The three major reasons for non-adherence were (1) forgot to use medications; (2) no time to use medications and (3) medications too difficult to use. Greater satisfaction with the treatment was positively associated with adherence and the more knowledgeable patients were more prone to non-adherence. **Conclusion:** In order to enhance adherence, emphasis should not just be put on improving patients' knowledge, but also focusing more on patients who are younger, apparently more knowledgeable or with earlier disease onset. Also, it is recommended that physicians prescribe simple treatment regimens to their patients and spend more time in establishing good doctor-patient relationship for enhancement of adherence.

目標：這項研究的目的是評估在香港銀屑病患者的局部治療依從性、心理影響、銀屑病控制滿意度和疾病知識。更重要的是，評估依從性和影響依從性的因素之間的關係。**方法：**這是在兩所公立皮膚科中心進行的橫斷面描述性研究。成人尋常型銀屑病患者被邀請為研究對象。**結果：**共有119患者完成了研究。總體而言，31患者（26%）依從治療和88患者（74%）沒有依從治療。依從治療組是>50歲，退休和40歲以後發病的。不依從的三個主要原因是(1)忘記使用藥物，(2)沒有時間使用藥物和(3)藥物太難使用。對治療滿意與依從性有正相關影響，但有知識的病患

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者是更容易沒有依從性。**結論：**爲了提高依從性，重點不應該僅僅放在改善病人的知識，還要更多地關注那些年輕患者，顯然更有知識或早期發病的患者。此外，醫生應該處方簡單的藥物治療給他們的病人，並花更多的時間用於與他們建立良好的關係以增強依從性。

Keywords: Adherence, psoriasis

關鍵詞：依從性、銀屑病

Introduction

Psoriasis is a chronic skin disease with a substantial psychosocial impact.¹⁻³ Topical therapy plays an important role in psoriasis treatment. Poor treatment outcomes from topical therapy regimens likely result from poor adherence.⁴⁻⁵ There are complex interactions among patients, the disease and treatment-related factors that might affect adherence. By augmenting those factors that improve adherence, a better treatment outcome can be anticipated.⁶

Adherence is the degree to which patients use medications as prescribed by their health care provider.⁷ In the latest systematic review done in 2012 on adherence to medical therapies in psoriasis,⁸ five studies showed a frequency of applications varying between 50% and 60% of that expected according to the prescriptions.⁹⁻¹³ Various determinants of adherence in psoriasis were found in different systematic reviews.^{4,5,8} They included socio-demographic factors, disease related factors, treatment related factors, psychosocial factors, patient satisfaction and knowledge level.

Objectives

The aims of the study were to evaluate patients' topical treatment adherence, psychosocial impact, satisfaction with disease control and disease knowledge among patients with psoriasis vulgaris in Hong Kong. More importantly, the relationship between adherence and factors that influence adherence in patients with psoriasis in our local setting was assessed.

Methods

Study design

This was a cross-sectional descriptive study performed at the Fanling Integrated Treatment Centre (FLITC) and Yung Fung Shee Dermatology Centre (YFSDC), of the Social Hygiene Service between January 2014 and March 2014.

Study population

Patients were included if they were aged 18 years or above with a primary diagnosis of psoriasis vulgaris receiving topical treatment +/- systemic or phototherapy who agreed to participate in this study. Patients with skin diseases other than psoriasis and patients who could not read Chinese or understand Cantonese were excluded.

Data collection

A self-constructed standardised questionnaire was used for data collection. The questionnaire consisted of six main parts:

The first part included their socio-demographic factors and disease-related factors. The translated versions of PDI and PLSI questionnaires in Cantonese were adapted in the second part to assess the functional disability and psychosocial impact due to psoriasis. The adherence rate and the reasons for non-adherence were assessed in the third part of the questionnaire. The adherence rate was evaluated by the self-reported frequency of topical medication use according to doctors' advice, which was classified into five categories: 90-100%, 50-89%, 10-49%, 1-9% and 0%. Items on patients' satisfaction to treatment and patients' satisfaction concerning follow-up frequency were

included in the fourth part of the questionnaire. The satisfaction of treatment was assessed by visual analogue scales on an 11-point scale. The satisfaction concerning follow-up frequency was classified as enough and not enough.

Patients' knowledge was assessed by 10 simple questions concerning psoriasis in the fifth part of the questionnaire. Disease severity was assessed in the sixth part of the questionnaire by using the Psoriasis Area and Severity Index (PASI).¹⁴

Definition of terms and assessment tools

Adherence assessment and definition of adherence

Patients' adherence was classified into five categories: 90-100%, 50-89%, 10-49%, 1-9% and 0%. Overall adherence was dichotomized as follows: patients who chose "90-100%" were defined as adherent and all others were defined as non-adherent.

Functional disability assessment: The Psoriasis Disability Index (PDI)

The Chinese version of PDI¹⁵⁻¹⁷ is a validated self-administered questionnaire consisting of 15 questions covering various aspects of functional disability due to psoriasis. Answers were recorded on a 4-point scale, ranging from "not at all" to "very much." The total score (0-45) was obtained by summing the scores of each question. Patients with PDI > 10 were generally considered as having significant disability due to psoriasis.

Psychological impact assessment: Psoriasis Life Stress Inventory (PLSI)

The 15-item version of PLSI was developed to measure stress associated with potential psoriasis related psychosocial problems.¹⁸ The scoring of PLSI was similar to PDI. PLSI > 10 was considered as significantly affected by psoriasis-related stress.

Satisfaction assessment and degree of satisfaction

The satisfaction of symptoms control was assessed by visual analogue scales and divided into three sub-groups, 0-3: low degree of satisfaction; 4-7: moderate degree of satisfaction, and 8-10: high degree of satisfaction.¹⁹

Knowledge assessment and definition for "Knowledgeable"

Patients' knowledge of psoriasis about the pathogenesis, aggravating factors, disease association and treatment was evaluated by asking to indicate "true", "false" or "don't know" to 10 simple questions. The knowledge score was divided into tertiles and then grouped into two categories: the upper tertile, corresponding to eight or more correct items, was defined as knowledgeable, the intermediate and lower tertiles were defined as not knowledgeable.

Ethics

Informed consent was given by patients. The study was approved by the Ethics committee, Department of Health (L/M 377/2013), Hong Kong Special Administrative Region.

Statistical analysis

Continuous data was presented as mean +/- standard deviation (SD) unless otherwise specified. Percentages were calculated for dichotomous variables. Group comparisons were made by Fisher's exact test or Pearson's chi-squared (χ^2) test for categorised variables and by the Mann-Whitney U test for ordinal variables. All p-values were two-sided, values of <0.05 were considered statistically significant.

SPSS for Windows version 20.0 (SPSS Inc., Chicago, IL, USA) was used for all statistical calculations.

Results

Characteristics of the sample populations

A total of 121 patients were enrolled in the study, and 119 patients (78 men, 41 women) completed the study protocol. Two patients (1.7%) could not complete the questionnaire (Table 1a).

The mean age of patients was 52.7 years (SD 14.10), the mean age of disease onset was 37.1 years (SD 14.62) and the average of duration of psoriasis was 15.5 years (SD 10.15).

The mean PASI score was 10.28 (SD 10.15). Thirty-nine patients (32.8%) had severe psoriasis (PASI >12), 18 patients (15.1%) had moderate psoriasis (PASI 7-12) and 62 patients (52.1%) had mild psoriasis (PASI <7). One hundred and eleven patients (93.3%) suffered from chronic plaque type psoriasis, two patients (1.7%) suffered from erythrodermic type psoriasis and six patients (5%) suffered from guttate type psoriasis. Eighteen patients (15.1%) had psoriatic arthropathy. Out of the 119 patients, 89 patients (74.8%) were on topical treatments only, 28 patients (23.5%) were on systemic and topical therapies. There were no patients (0%) on phototherapy and two patients (1.7%) were on biologic and topical therapies (Table 2a).

Adherence rate

Overall, 31 subjects (26%) complied with treatment and 88 subjects (74%) did not adhere to topical treatment. Twenty six percent of patients were in the adherent group with 90-100% adherence, 48% of patients were in the 50-89% category, 20% of patients were in the 10-49% category, 5% of patients were in the 1-9% category and 1% of patients were in the 0% category (Figure 1).

Socio-demographic and disease-related features

The results of the association between socio-demographic and disease-related features between adherent and non-adherent patients are summarised in Tables 1a & 2a.

A statistically significant difference between adherent and non-adherent patients was detected for age ($p=0.008$), occupational status ($p=0.009$) and age of onset ($p=0.003$).

Subgroup analysis was done for age, occupational status and age of onset.

Subjects who adhered to treatment were more likely to be retired ($p=0.002$) (Table 1b), >50 years old ($p=0.001$) (Table 1c) and had disease onset after 40 years old ($p=0.001$) (Table 2b).

Reasons for non-adherence

The three major reasons for not using topical medications in non-adherent patients were 1) forgot to use medications (44 patients, 50.0%), 2) no time to use medications (38 patients, 43.2%) and 3) too difficult to use medications (26 patients, 29.5%) (Table 3).

A statistically significant difference between adherent and non-adherent patients was detected for reasons including 1) forgot to use medications ($p=0.003$), 2) no time to use medications ($p=0.000$), 3) medications too difficult to use ($p=0.009$), 4) medications inconvenient to use ($p=0.014$) and 5) worried about side effects ($p=0.045$) (Table 3).

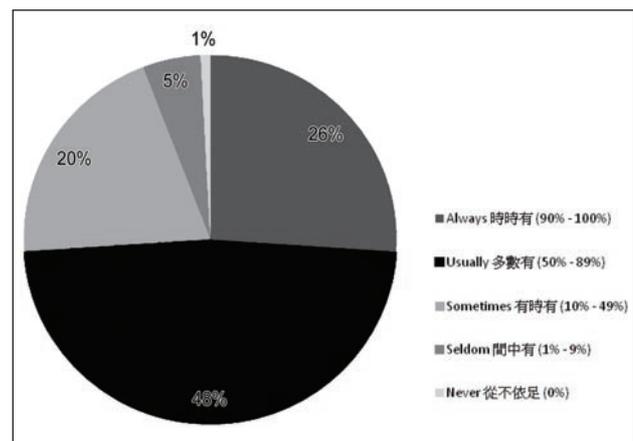


Figure 1. Adherence rate.

Table 1a. Socio-demographic features of adherent and non-adherent groups (Total number of respondents = 119)

Field	Adherent		Non-adherent		Total		Test method	p-value
	N	(%)	N	(%)	N	(%)		
Gender							Chi-Square	0.888
Male	20	(64.5%)	58	(65.9%)	78	(65.5%)		
Female	11	(35.5%)	30	(34.1%)	41	(34.5%)		
Age group							Mann-Whitney	0.008
18-35	3	(9.7%)	13	(14.8%)	16	(13.4%)		
36-50	2	(6.5%)	32	(36.4%)	34	(28.6%)		
51-65	20	(64.5%)	31	(35.2%)	51	(42.9%)		
66+	6	(19.4%)	12	(13.6%)	18	(15.1%)		
Marital status							Chi-Square	0.969
Married	25	(80.6%)	69	(78.4%)	94	(79.0%)		
Single	4	(12.9%)	13	(14.8%)	17	(14.3%)		
Divorced	1	(3.2%)	4	(4.5%)	5	(4.2%)		
Widowed	1	(3.2%)	2	(2.3%)	3	(2.5%)		
Education							Mann-Whitney	0.088
No education	2	(6.5%)	1	(1.1%)	3	(2.5%)		
Primary	8	(25.8%)	17	(19.3%)	25	(21.0%)		
Secondary	18	(58.1%)	53	(60.2%)	71	(59.7%)		
Post-secondary	3	(9.7%)	17	(19.3%)	20	(16.8%)		
Occupation status							Chi-Square	0.009
Employed	11	(35.5%)	58	(65.9%)	69	(58.0%)		
Housewife	5	(16.1%)	11	(12.5%)	16	(13.4%)		
Retired	13	(41.9%)	13	(14.8%)	26	(21.8%)		
Unemployed	2	(6.5%)	6	(6.8%)	8	(6.7%)		
Religion							Chi-Square	0.101
Yes	6	(19.4%)	31	(35.2%)	37	(31.1%)		
No	25	(80.6%)	57	(64.8%)	82	(68.9%)		
Living status							Chi-Square	0.227
Live with others	31	(100.0%)	84	(92.5%)	115	(96.6%)		
Live alone	0	(0.0%)	4	(4.5%)	4	(3.4%)		
House type							Chi-Square	0.340
Public housing	17	(54.8%)	33	(37.5%)	50	(42.0%)		
Private housing	7	(22.6%)	24	(27.3%)	31	(26.1%)		
Subsidize housing	7	(22.6%)	29	(33.0%)	36	(30.3%)		
Ohters	0	(0.0%)	2	(2.3%)	2	(1.7%)		
Smoking status							Chi-Square	0.209
Non-smoker	25	(80.6%)	56	(63.6%)	81	(68.1%)		
Current smoker	4	(12.9%)	19	(21.6%)	23	(19.3%)		
Ex-smoker	2	(6.5%)	13	(14.8%)	15	(12.6%)		
Drinking status							Chi-Square	0.594
Non-drinker	26	(83.9%)	66	(75.0%)	92	(77.3%)		
Current drinker	4	(12.9%)	17	(19.3%)	21	(17.6%)		
Ex-drinker	1	(3.2%)	5	(5.7%)	6	(5.0%)		

Psychosocial impact

The mean PDI score was 4.59 (SD 5.21) and the mean PLSI score was 5.08 (SD 5.13). Regarding PDI and PLSI scores, there was no statistically significant difference between the adherent and non-adherent groups.

Satisfaction level

Overall, the mean satisfaction score was 6.06 (SD 2.40). In the adherent group, the mean score was 6.90 (SD 2.21) and in the non-adherent group, the mean score was 5.76 (SD 2.40).

The percentage of patients with a high degree of satisfaction was 41.9% in the adherent group compared with 25.0% in the non-adherent group. The percentage of patients with a

moderate degree of satisfaction was 51.6% among the adherent group compared with 58.0% in the non-adherent group. The percentage of patients with low degree of satisfaction was 6.5% among the adherent group compared with 17.0% in the non-adherent group. A higher satisfaction level among adherent patients was found ($p=0.041$).

Furthermore, 80.7% patients claimed that the follow-up frequency was enough. The percentage of patients who claimed enough follow-up was 67.7% among the adherent group compared with 85.2% in the non-adherent group. A statistically significant difference between adherent and non-adherent patients was detected for follow-up frequency. A higher prevalence of "follow-up frequency adequate" among the non-adherent group was found ($p=0.034$).

Table 1b. Occupational status subgroup analysis (Total number of respondents = 119)

Field	Adherent N (%)	Non-adherent N (%)	Total N (%)	Test method	p-value
Occupation status				Chi-Square	0.009
Employed	11 (35.5%)	58 (65.9%)	69 (58.0%)		
Housewife	5 (16.1%)	11 (12.5%)	16 (13.4%)		
Retired	13 (41.9%)	13 (14.8%)	26 (21.8%)		
Unemployed	2 (6.5%)	6 (6.8%)	8 (6.7%)		
Occupation status group				Chi-Square	0.002
Retired	13 (41.9%)	13 (14.8%)	26 (21.8%)		
Employed/Housewife/ Unemployed	18 (58.1%)	75 (85.2%)	93 (78.2%)		

Table 1c. Age subgroup analysis (Total number of respondents = 119)

Field	Adherent N (%)	Non-adherent N (%)	Total N (%)	Test method	p-value
Age group				Mann-Whitney	0.008
18-35	3 (9.7%)	13 (14.8%)	16 (13.4%)		
36-50	2 (6.5%)	32 (36.4%)	34 (28.6%)		
51-65	20 (64.5%)	31 (35.2%)	51 (42.9%)		
66+	6 (19.4%)	12 (13.6%)	18 (15.1%)		
Age group				Chi-Square	0.001
0-50	5 (16.1%)	45 (51.1%)	50 (42.0%)		
51+	26 (83.9%)	43 (48.9%)	69 (58.0%)		

Knowledge score

Overall, the mean number of correct answers was 6.37 (SD 2.49). The mean number of correct answers was 5.84 in the adherent group (SD 2.38) and 6.56 in the non-adherent group (SD 2.51).

The percentage of knowledgeable patients (i.e. correctly answered eight or more questions) was 22.6% among the adherent group compared with 45.5% in the non-adherent group ($p=0.025$). The percentage of patients with 0-4 correct answers, corresponding to the lower tertile was 32.2%

Table 2a. Disease-related features of adherent and non-adherent groups (Total number of respondents = 119)

Field	Adherent N (%)	Non-adherent N (%)	Total N (%)	Test method	p-value
Subtype of psoriasis				Chi-Square	0.279
Chronic plaque	27 (87.1%)	84 (95.5%)	111 (93.3%)		
Erythrodermic	1 (3.2%)	1 (1.1%)	2 (1.7%)		
Guttate	3 (9.7%)	3 (3.4%)	6 (5.0%)		
Joint involvement				Chi-Square	0.445
Yes	6 (19.4%)	12 (13.6%)	18 (15.1%)		
No	25 (80.6%)	76 (86.4%)	101 (84.9%)		
Applied treatment				Chi-Square	0.054
Topical treatment only	19 (61.3%)	70 (79.5%)	89 (74.8%)		
Oral systemic treatment and topical treatment	12 (38.7%)	16 (18.2%)	28 (23.5%)		
Biologics and topical treatment	0 (0.0%)	2 (2.3%)	2 (1.7%)		
Phototherapy and topical treatment	0 (0.0%)	0 (0.0%)	0 (0.0%)		
PASI score				Mann-Whitney	0.841
0-7.0	16 (51.6%)	46 (52.3%)	62 (52.1%)		
7.1-12.0	4 (12.9%)	14 (15.9%)	18 (15.1%)		
12.1+	11 (35.5%)	28 (31.8%)	39 (32.8%)		
Age of onset (years)				Mann-Whitney	0.003
0-19	3 (9.7%)	11 (12.5%)	14 (11.8%)		
20-40	7 (22.6%)	48 (54.5%)	55 (46.2%)		
41+	21 (67.7%)	29 (33.0%)	50 (42.0%)		
Disease duration (years)				Mann-Whitney	0.616
0-9	8 (25.8%)	26 (29.5%)	34 (28.6%)		
10-20	14 (45.2%)	40 (45.5%)	54 (45.4%)		
21+	9 (29.0%)	22 (25.0%)	31 (26.1%)		
Family history				Chi-Square	0.703
No	28 (90.3%)	75 (85.2%)	103 (86.6%)		
Direct relatives	3 (9.7%)	12 (13.6%)	15 (12.6%)		
Indirect relatives	0 (0.0%)	1 (1.1%)	1 (0.8%)		
Past medical history				Chi-Square	0.123
Good	10 (32.3%)	46 (52.3%)	56 (47.1%)		
Depression or anxiety disorder	1 (3.2%)	4 (4.5%)	5 (4.2%)		
Others	20 (64.5%)	38 (43.2%)	58 (48.7%)		

among the adherent group compared with 20.4% in the non-adherent group. The percentage of patients with 5-7 correct answers, corresponding to the intermediate tertile was 45.2% among the adherent group compared with 34.1% in the non-adherent group. There was a higher prevalence of knowledgeable patients in the non-adherent group ($p=0.025$).

Discussion

Adherence rate

The mean rate of adherence score in the study was found to be 26%. Previous studies showed a frequency of applications varying between 50% and 60% of that expected according to the prescriptions.⁹⁻¹³ Different results were reported in these studies of medication adherence, which might be explained by different methods of measurement and definitions of adherence.

This study was designed to evaluate adherence by using a self-reporting method. Although the self-reported method is relatively simple to use, the adherence is often overestimated. Also, the accuracy depends on patients' cognitive abilities and honesty.

The dichotomised method was used to classify adherence in this study and a relatively strict definition was used for "adherence" since self-reported measures have been reported to

overestimate adherence.⁸ In another point of view, most of the patients (48%) in this study reported their frequency of medication use was 50-89%, which is in line with previous studies.

The possible reasons for non-adherence to topical treatment

In this study more patients reported that they did not use the medications unintentionally as they simply forgot or they had no time to apply the medications.

Time seems to be one of the main factors affecting adherence in our locality, since the retired patients were found to be more compliant.

Patients also reported that the medications were too difficult to use as they were given specific medications for different sites of different degrees of severity. The medical regimen should be made as simple as possible; that is, the number of medications and frequency of usage should be minimised.

Psychosocial impact of disease

The hypothesis in this study was that patients with psychological distress had a negative relationship with adherence. However, no association between PDI/PLSI scores and adherence could be identified in this study. The mean PDI and PLSI scores in the study were both low (<10). Hence, the hypothesis was not true and it might be due to selection bias as patients who had higher PDI and PLSI scores

Table 2b. Age of onset subgroup analysis (Total number of respondents = 119)

Field	Adherent N (%)	Non-adherent N (%)	Total N (%)	Test method	p-value
Age at onset group				Mann-Whitney	0.003
0-19	3 (9.7%)	11 (12.5%)	14 (11.8%)		
20-40	7 (22.6%)	48 (54.5%)	55 (46.2%)		
41+	21 (67.7%)	29 (33.0%)	50 (42.0%)		
Age at onset group				Chi-Square	0.001
0-40	10 (32.3%)	59 (67.0%)	69 (58.0%)		
41+	21 (67.7%)	29 (33.0%)	50 (42.0%)		

Table 3. Reasons for non-adherence of adherent and non-adherent groups (Total number of respondents = 119)

Field	Adherent		Non-adherent		Total		Test method	p-value
	N	(%)	N	(%)	N	(%)		
Poor efficacy 因為藥膏療效不大							Chi-Square	0.259
Yes	5	(16.1%)	23	(26.1%)	28	(23.5%)		
No	26	(83.9%)	65	(73.9%)	91	(76.5%)		
Smelly 好大味							Chi-Square	0.786
Yes	2	(6.5%)	7	(8.0%)	9	(7.6%)		
No	29	(93.5%)	81	(92.0%)	110	(92.4%)		
Too oily 太油膩							Chi-Square	0.352
Yes	4	(12.9%)	18	(20.5%)	22	(18.5%)		
No	27	(87.1%)	70	(79.5%)	97	(81.5%)		
Medication inconvenient to use 使用上不方便							Chi-Square	0.014
Yes	1	(3.2%)	20	(22.7%)	21	(17.6%)		
No	30	(96.8%)	68	(77.3%)	98	(82.4%)		
Worry about potential side effects 擔心藥物的副作用							Chi-Square	0.045
Yes	2	(6.5%)	20	(22.7%)	22	(18.5%)		
No	29	(93.5%)	68	(77.3%)	97	(81.5%)		
No time to use medication 無時間塗							Chi-Square	0.000
Yes	2	(6.5%)	38	(43.2%)	40	(33.6%)		
No	29	(93.5%)	50	(56.8%)	79	(66.4%)		
Forgot to use medication 有時唔記得塗							Chi-Square	0.003
Yes	6	(19.4%)	44	(50.0%)	50	(42.0%)		
No	25	(80.6%)	44	(50.0%)	69	(58.0%)		
Not enough medication 唔夠藥膏							Chi-Square	0.694
Yes	5	(16.1%)	17	(19.3%)	22	(18.5%)		
No	26	(83.9%)	71	(80.7%)	97	(81.5%)		
Medication too difficult to use 太複雜，不同部位塗不同藥物							Chi-Square	0.009
Yes	2	(6.5%)	26	(29.5%)	28	(23.5%)		
No	29	(93.5%)	62	(70.5%)	91	(76.5%)		
Instruction not clear 使用方法指示不清楚							Chi-Square	0.397
Yes	0	(0.0%)	2	(2.3%)	2	(1.7%)		
No	31	(100.0%)	86	(97.7%)	117	(98.3%)		
Using other treatments 正接受其他治療							Chi-Square	0.298
Yes	0	(0.0%)	3	(3.4%)	3	(2.5%)		
No	31	(100.0%)	85	(96.6%)	116	(97.5%)		

with more psychosocial distress refused to enroll in the study.

Patients' satisfaction with treatment

A higher satisfaction level was found among adherent patients in this study. The level of satisfaction may be affected by many factors e.g. doctor-patient relationship and time the physician spent during consultation, disease condition and treatment efficacy. Therefore one of the methods to improve adherence may be to spend enough time with the patient during the consultation to establish a good relationship and to improve patient satisfaction.

A statistically significant difference between adherent and non-adherent patients was detected for follow-up frequency. Interestingly, a higher proportion of patients in the non-adherent group found that the follow-up frequency was adequate. Thus, the results showed that the non-adherence of patients was not due to a long follow-up time.

Patients' knowledge

The percentage of patients with good knowledge was 22.6% among the adherent group compared with 45.5% in the non-adherent group. The hypothesis that patients did not adhere to treatment because of poor knowledge was not supported by this study. As a matter of fact, the most knowledgeable patients were not as compliant as we thought.

Limitations of the study

This cross-sectional descriptive study was done in two public dermatology centres (FLITC and YFSDC). The study could not be performed in all public dermatology centres due to limited resources. The setting of this study was in public dermatology outpatient clinics and only outpatients were studied. Better adherence might be found in a private dermatology clinic setting.

The study recruited 121 patients. The relatively small sample size may not have sufficient power to detect predictors of adherence. The recruitment

of subjects to answer the questionnaires was on a voluntary basis and selection bias might be present. Patients with higher PLSI or PDI scores might be less willing to enroll in the study.

The questionnaire format had an inherent potential to introduce recall bias about past medication use and psychosocial impact. The study data might be limited by the non-validated self-reported measurement of treatment adherence. The definition of adherence was arbitrary, but there was no standard or better way to define adherence. Instruments e.g. PDI and PLSI developed in a different time, country, or cultural context might not be a valid measure for the study group of patients. Similarly, there were no standardised questions that can be used to assess knowledge on psoriasis.

Conclusion

In this study, older age, retirement and greater satisfaction to the treatment were the factors which have positive associations with adherence. Patients with onset of disease at a younger age and being more knowledgeable were prone to non-adherence. The three main reasons for not using medications in non-adherent patients included 1) forgot to use medications, 2) no time and 3) medications too difficult to use.

Based on the study findings, in order to improve the adherence, the emphasis should not just be placed on patient education on how to use different treatment regimens and counselling of treatment side effects, more importantly, the focus should be put on younger patients and patients with earlier disease onset. Therefore, more time should be spent in these groups of patients during consultation. Furthermore, physicians need to simplify treatment regimens and spend sufficient time with patients suffering from psoriasis during follow-up to establish a good relationship and improve patient satisfaction and adherence.

Since psoriasis is a distressing and life-ruining condition, hopefully in the future, we can have a better understanding of the determinants of adherence. This was a pilot study on adherence problems in psoriasis in Hong Kong and hopefully, this provided a platform for further studies in this field.

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