

The relationship between illness representations, alexithymia, coping strategies and subjective well-being among persons with asthma

Shiri Shinan-Altman & Keren-Or Katzav

To cite this article: Shiri Shinan-Altman & Keren-Or Katzav (2020): The relationship between illness representations, alexithymia, coping strategies and subjective well-being among persons with asthma, Journal of Asthma, DOI: [10.1080/02770903.2020.1741610](https://doi.org/10.1080/02770903.2020.1741610)

To link to this article: <https://doi.org/10.1080/02770903.2020.1741610>



Accepted author version posted online: 11 Mar 2020.
Published online: 16 Mar 2020.



Submit your article to this journal [↗](#)



Article views: 16



View related articles [↗](#)



View Crossmark data [↗](#)



The relationship between illness representations, alexithymia, coping strategies and subjective well-being among persons with asthma

Shiri Shinan-Altman, PhD and Keren-Or Katzav, MSW

The Louis and Gabi Weisfeld School of Social Work, Bar Ilan University, Ramat-Gan, Israel

ABSTRACT

Background: In order to examine subjective well-being (SWB) among persons with asthma, most of the existing studies have focused on disease-related variables or concentrated on illness representations, alexithymia and coping, making it difficult to determine whether the relationship between illness representations, alexithymia, coping and SWB is just an artifact of the disease's severity.

Objective: Based on the Self-Regulation Model, this study aimed to examine the interrelationships between the disease's characteristics (annual mean of asthma attacks, preventive treatment), illness representations, alexithymia, coping strategies and SWB among persons with asthma.

Methods: A convenience sample of 208 persons with asthma completed measures of the disease's characteristics (annual mean of asthma attacks, preventive treatment), illness representations (identity, causes, timeline, consequences, control, coherence, emotional representations), alexithymia, coping strategies, SWB, and socio-demographic questionnaires. A hierarchical multiple regression was calculated with SWB as the dependent variable.

Results: The regression model was found significant ($F(14, 133) = 6.42, p < 0.001$), explaining 34% of the variance in SWB. Higher levels of alexithymia, identity, cause and emotional representations and lower levels of control were related to lower levels of SWB. The addition of coping strategies did not add to the explained variance of SWB.

Conclusion: This study contributes to a better understanding of the determinants of SWB among persons with asthma. The findings indicate that clinical interventions targeting persons with asthma illness representations and alexithymia may assist persons with asthma to improve their SWB.

ARTICLE HISTORY

Received 7 November 2019

Revised 4 March 2020

Accepted 6 March 2020

KEYWORDS

Alexithymia; asthma; coping strategies; illness representations; subjective well-being

Introduction

Asthma is a heterogeneous chronic disease characterized by recurrent attacks of breathlessness and wheezing and is associated with gene-environment interactions (1). Asthma presents a significant global health burden as more than 235 million people worldwide are affected by asthma, and over 380 000 deaths were attributed to asthma over a 12-month period (2). Asthma attacks move along a continuum of intensity and duration, meaning they may not appear for long periods, while one episodic attack may be life-threatening (3). Given the severe characteristics of the disease, persons with asthma face many negative consequences, with impaired subjective well-being considered to be one of the most significant consequences (4).

Subjective well-being (SWB) has been defined as a broad concept comprising a wide range of distinct

dimensions such as life satisfaction, positive affect, personal growth, and autonomy (5,6). To date, various studies examined SWB factors among persons with asthma (7,8). For example, it was found that asthma has a significant impact on the SWB of participants due to symptom experience and treatments they had to undergo (7). However, most prior studies focused on medical aspects to improve functional ability to promote SWB among persons with asthma, providing few indicators as to how health professionals may be able to assist persons with asthma in promoting SWB in relation to this challenging disease (7). Furthermore, although SWB is likely to involve numerous associated interacting factors (9,10), only a handful of studies examined this construct among persons with asthma guided by a theoretical framework (e.g. (4)). In order to overcome these shortcomings in the literature, the present study examined factors associated with SWB

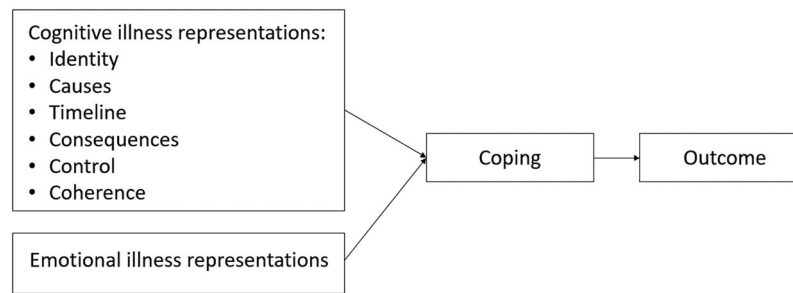


Figure 1. The self-regulation model (Leventhal et al., 1980).

among persons with asthma, using the self-regulation model (11) as a conceptual framework.

The self-regulation model

The self-regulation model (SRM), which was initially described in 1980 (11) (Figure 1), refers to the ways in which individuals perceive illness (cognitive illness representations) and react to it emotionally (emotional representations). The *cognitive component* consists of six dimensions (12): Identity – perceptions of symptoms; Causes – the perceived causes of the symptoms; Timeline – beliefs about the duration of the illness; Consequences – the perceived impact of the illness; Control – the perceived ability to control the illness; and Coherence – the extent to which patients perceive they understand the illness. The *emotional component* refers to the production of emotional responses to the illness, such as concern and anxiety.

Research on illness representations in asthma have shown relationships with a variety of outcomes, such as medication adherence and quality of life (13–15). For example, it was found that stronger beliefs in the personal impact and severity of asthma, and having a better understanding of asthma were associated with better asthma self-management (16). Another study found that both identifying more symptoms (identity) and higher treatment beliefs were significantly, and strongly, associated with higher self-reported medication adherence among asthmatic population (14). The present study was designed to provide a further test of the SRM by examining alexithymia in the framework of this model, as previous studies emphasized the role and high prevalence of alexithymia in persons with asthma (17).

Alexithymia is a personality dimension, characterized by different cognitive and emotional features, such as difficulty in describing and identifying emotions, problems communicating feelings, and limited imagination (18). As such, individuals with alexithymia have difficulty in identifying and describing emotions and tend to misinterpret their emotional arousal

as signs of physical disease (19), which may affect their SWB (20).

According to the SRM, illness representations are associated with coping strategies (21), and coping strategies play a mediating role between illness representations and health outcomes (22). *Coping strategies* are defined as the cognitive and behavioral actions a person takes (or does not take) to enhance health and treatment (i.e. cure or control), and rehabilitate from the illness. However, only a few studies have examined the mediating effects of coping strategies on the associations between illness representations and outcomes. These studies have been conducted in populations with chronic diseases other than asthma, and results on the mediating effects of coping are inconsistent (23). Furthermore, there is limited evidence about the association of coping strategies with SWB in the presence of the disease's characteristics (e.g. annual mean of asthma attacks, preventive treatment), illness representations and alexithymia.

The present research

Based on the SRM, the aim of the present study was to examine the interrelationships between the disease's characteristics (annual mean of asthma attacks, preventive treatment), illness representations, alexithymia, coping strategies and SWB among persons with asthma. We also hypothesized that coping strategies will mediate the association between illness representations and alexithymia (independent variables) and SWB (the outcome variable).

Method

Procedure and study's population

In a pre-study, a questionnaire was distributed to 10 persons with asthma to test the clarity of the items, identify difficulties in understanding them, and examine the reliability of the questionnaires. Comments from this pilot study contributed to the construction

of the final questionnaire such as changing wording where necessary. Next, questionnaires were administered through the Qualtrics online platform (www.qualtrics.com). Participants were invited via the Internet to take part in a survey on the SWB of persons with asthma. They were recruited mainly through Internet forums and websites dealing with asthma which were selected randomly, as well as through social media outlets (Facebook pages focusing on asthma). These types of recruiting participants allowed us to access a wider group of individuals with asthma at different stages of the disease. Notes on these websites contained a short explanation about the study and a link to the questionnaire. We assume that the current sample included only Israelis because the randomly selected Internet forums and websites were in Hebrew. The protocol study was approved by Bar-Ilan University's Ethics Committee of the School of Social Work.

The study population was formed by persons who were diagnosed with asthma aged ≥ 18 years. The study included 208 persons with asthma. As shown in Table 1, the mean age was 29.6 years, with a range of 18 to 74. The majority were single women, born in Israel and almost half of the participants had children. Most of the participants had more than 12 years of education.

Measures

Dependent variable

Subjective well-being was assessed using the short version of the Mental Health Inventory (24) (MHI). This instrument includes 21 items (e.g. "How much of the time, during the past month, have you felt calm and peaceful?"). Respondents rated each item on a 6-point Likert-type scale, which measured the frequency or intensity as to how they felt during the past month (1 = all of the time, 6 = Never). Scores were reversed and mean scores were calculated, higher scores indicating lower reported SWB.

Independent variables

Illness representations were assessed using the Revised Illness Perception Questionnaire and included seven dimensions: identity, causes, timeline, consequences, control, coherence and emotional representations (IPQ-R¹²). For the illness identity dimension, participants were asked whether they perceived a list of 14 symptoms (e.g. nausea, shortness of breath, heavy breathing) as being related to asthma (0 = no, 1 = yes). An overall index was calculated by summing the

Table 1. Participants' characteristics ($N = 208$).

Socio-demographic characteristics	
Mean age (SD), range	29.58 (9.13), 18-74
Gender (%)	
Male	55 (26.8)
Female	150 (73.2)
Marital status (%)	
Married	70 (34.0)
Not married	136 (66.0)
Place of birth (%)	
Israel	169 (88.5)
Other	22 (11.5)
Have children (%)	
Yes	102 (48.6)
No	105 (51.4)
Education (%)	
More than 12 years of education	121 (65.1)
Less than 12 years of education	65 (34.9)

number of symptoms rated as being related to asthma. Total scores ranged from 0 to 14, with higher scores indicating a stronger illness identity.

Based on the IPQ-R12, for the other dimensions, participants were asked to indicate their degree of agreement on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree) in relation to 17 items referring to attribution to asthma (e.g. "stress or worry"); 5 statements concerning acute/chronic timeline (e.g. "asthma lasts a short time"); 6 items about the severe consequences of asthma (e.g. "asthma is a serious condition"); 11 items representing beliefs about personal and treatment control (e.g. "The course of asthma depends on the patient"); 5 items about the coherence of asthma (e.g. "I don't understand asthma"); and 6 items dealing with emotions caused by asthma (e.g. "asthma makes me feel angry"). Scores were reversed and overall indices for all dimensions were calculated as the mean of the items per-scale, with a higher score indicating stronger perceptions of the assessed attributions.

Coping strategies were assessed using the COPE, a 30-item Hebrew version questionnaire, based on the scale developed by Carver et al. (25). Items were divided into 15 coping strategies – 2 items per strategy. Participants were asked to rate the extent to which they used each coping option in stressful situations on a 4-point Likert-type scale ranging from 1 = I usually don't do this at all to 4 = I usually do this a lot. A factor analysis with Varimax rotation showed a two-factor structure, as reported by Carver et al. (24): the Problem-Focused scale included six coping strategies and the Emotion-Focused scale included four coping strategies.

Alexithymia was assessed using the Toronto Alexithymia Scale (TAS-20 (26)). This scale includes 20 items, scored on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree (e.g.

"I often find it difficult to understand what emotion I am feeling"). Mean scores were calculated, higher scores indicating higher levels of alexithymia.

Annual mean of asthma attacks was examined with the question: "How many asthma attacks do you have during a one-year period?"

Preventive treatment was examined with the question: "Do you use preventive treatment?" (0= no, 1= yes).

Sociodemographic details included age, gender (female/male), marital status (married/not married), have children (yes/no), education (more than 12 years of education/less than 12 years of education). It should be noted that marital status was originally measured with 4 categories (married, single, divorced, separated) and was collapsed into two mutually exclusive categories, based on responses. Marital status was tested in order to obtain a broad picture of participants' background characteristics.

Statistical analysis

Data were analyzed using SPSS ver. 25. Descriptive statistics were used to describe the participants' demographic characteristics and the research variables. Pearson correlations were calculated to assess the associations between the research variables. Age and annual mean of asthma attacks were positively skewed, and were thus log transformed. A hierarchical multiple regression was calculated with SWB as the dependent variable. Gender (1-males, 0-females) and marital status (1-married, 0-not married) were entered in the first step; disease characteristics (annual mean of asthma attacks and preventive treatment) were entered in the second step; alexithymia and illness representations were entered in the third step; and

coping strategies were entered in the fourth step. Because of the high correlation between the subscales of the cause dimension ($r=0.71$), a total cause score was used in the bi-variate and regression analysis, with an internal consistency (α) 0.87.

Results

The internal consistency (α) found in the present study for each of the measures was as follows: subjective well-being $\alpha=0.95$; illness representations α ranged from 0.67 to 0.93; problem-focused coping strategies $\alpha=0.82$; emotion-focused coping strategies $\alpha=0.64$; alexithymia $\alpha=0.83$.

The study included 208 persons with asthma. Table 2 summarizes the means, SDs, ranges and correlates of the study variables. As can be seen, the mean SWB score was relatively moderate (actual range 1.24–5.34). The annual mean of asthma attacks was 9.6. Most participants reported a moderate number of symptoms they identified or believed to be associated with asthma, perceived the disease as more chronic (actual range 1–4.67), attributed several moderate causes of the disease (actual range 1–4.18), perceived asthma as having moderately serious consequences (actual range 1–4.67), reported high control of the disease (actual range 1.36–5), and high understanding of their disease (actual range 2–5). Participants reported low levels of negative emotional representations (Mean = 2.07, SD = 0.71, actual range 1–5). It also appears that participants used less problem-focused coping strategies (actual range 1–3.5) and more emotion-focused coping strategies (actual range 0.93–2.79), and reported low levels of alexithymia (actual range 1–3.8).

In addition, regarding the causes to which persons with asthma attributed their disease, seventy patients

Table 2. Means, SDs, and Correlates of study variables ($n=208$).

Variable	Mean, SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SWB	3.03, 0.91	–												
2. Preventive treatment	–	–0.02	–											
3. Annual mean of asthma attacks	9.6, 45.7	–0.07	–0.05	–										
4. Identity	4.61, 0.20	–0.12	–0.09	0.05	–									
5. Timeline	3.83, 1.14	–0.10	0.23**	0.02	0.13	–								
6. Cause	2.16, 0.65	–0.19**	–0.11	–0.01	0.22**	–0.04	–							
7. Consequences	2.23, 0.80	–0.09	0.28**	0.23**	0.39**	0.24**	0.16*	–						
8. Control	3.40, 0.65	0.30**	0.01	0.01	–0.16*	–0.25**	0.16*	–0.23**	–					
9. Understanding	4.20, 0.68	0.18**	0.16*	0.86	–0.14	0.05	–0.14	–0.24**	0.37**	–				
10. Emotional representations	2.07, 0.71	–0.29**	–0.18*	0.07	0.18**	0.08	0.27**	0.50**	–0.15*	–0.35**	–			
11. Problem-focused coping strategies	2.60, 0.51	0.14*	0.13	0.12	0.06	–0.03	0.20**	–0.03	0.24**	–0.03	–0.03	–		
12. Emotion-focused coping strategies	1.86, 0.35	–0.13	0.10	0.08	0.06	0.02	0.23**	0.07	–0.04	–0.23**	0.16*	0.45**	–	
13. Alexithymia	2.16, 0.54	–0.38**	0.14	–0.17	0.17	–0.10	0.02	0.10	–0.16*	–0.34**	0.15*	–0.30**	0.18	

* $p < 0.05$; ** $p < 0.01$.

Note: Preventive treatment was coded as a nominal variable; therefore, mean and SD were not calculated for this variable.

(33.8%) attributed their condition to psychological reasons, eighty-eight patients (47.4%) to risk factors, twenty (7.5%) to immunity, and thirty (11.3%) to accident or chance.

According to Table 2, positive associations were found between SWB, control, understanding and problem-focused coping strategies. Negative associations were found between SWB, cause, emotional representations and alexithymia.

SWB was higher among males ($M=4.26$, $SD = 0.95$) than females ($M=3.96$, $SD = 0.88$) ($t(203) = 2.11$, $p=0.036$), and higher among married participants ($M=4.34$, $SD = 0.78$) than non-married ones ($M=3.88$, $SD = 0.94$) ($t(165.11) = 3.73$, $p < 0.001$). The correlation between age and SWB was non-significant ($r=0.13$, $p=0.062$), and age was significantly higher among married participants ($t(197) = 6.06$, $p < 0.001$). Having children was not related either to SWB ($p=0.162$) or education level ($p=0.528$). Thus, analyses were calculated while controlling for gender and marital status.

Hierarchical multiple regression analysis for identifying SWB correlates

As can be observed in Table 3, in the first equation, 8% of the variance in SWB was explained, with marital status being significant. Variables in the next equations added an additional 26% to the explained variance in the dependent variable, with alexithymia, identity, cause, control, and emotional illness representations being significant. Namely, higher levels of alexithymia, identity, cause and emotional representations and lower levels of control were related to lower

levels of SWB. The addition of coping strategies did not add to the explained variance of SWB. *To sum up*, the regression model was found significant ($F(14, 133) = 6.42$, $p < 0.001$), explaining 34% of the variance in SWB.

Discussion

According to this cross-sectional study, higher levels of alexithymia, identity, cause and emotional representations and lower levels of control were related to lower levels of SWB. The addition of coping strategies did not add to the explained variance of SWB. We also found that participants reported relatively moderate levels of SWB. This finding is in line with the findings of previous studies conducted in other countries such as Ireland (7), China, Singapore, South Korea, and Taiwan (27), meaning that persons with asthma experience decreased SWB. These findings indicate that improving SWB is an identified objective for persons with asthma and a concern of professionals, scholars, and policymakers worldwide.

Overall, participants' cognitive and emotional illness representations are congruent with the clinical characteristics of asthma. Regarding the causes to which persons with asthma attributed their disease, we found that almost half of the participants indicated that risk factors were the main cause for the development of the disease. This finding is somewhat encouraging, given that risk perceptions may guide people to engage in protective behavior toward their disease (28), such as using inhalation when needed and not smoking. However, it should be noted that persons with asthma who are aware of the disease's risk

Table 3. Hierarchical multiple regression analysis for identifying SWB correlates ($N = 208$).

Step 1	β	$\Delta \text{adj. } R^2$	Step 2	β	$\Delta \text{adj. } R^2$	Step 3	β	$\Delta \text{adj. } R^2$	Step 4	β	$\Delta \text{adj. } R^2$	Total Adj. R^2
Gender	.12		Gender	.12		Gender	.06		Gender	.07		
Marital status	.28***		Marital status	.29***		Marital status	.23**		Marital status	.22**		
		.08***	Annual mean of asthma attacks	-.02		Annual mean of asthma attacks	.02		Annual mean of asthma attacks	.01		
			Preventive treatment	.05		Preventive treatment	.02		Preventive treatment	.02		
					-.01	Alexithymia	-.34***		Alexithymia	-.28***		
						Identity	-.15*		Identity			
						Cause	-.14		Cause	-.16*		
						Timeline	.01		Timeline	-.15*		
						Consequence	.11		Consequence	.12		
						Control	.29***		Control	.25**		
						Coherence	-.13		Coherence	-.11		
						Emotional representations	-.19*		Emotional representations	-.20*		
								.26***	Problem-focused coping	.16		
									Emotion-focused coping	-.05		
											.01	
												.34***

* $p < .05$; ** $p < .01$; *** $p < .001$.

factors may feel more threatened, and may be more worried and mentally involved with their disease because of their higher educational level and/or deeper understanding of the disease (29).

Even after controlling for disease characteristics (annual mean of asthma attacks and preventive treatment), we found that higher levels of alexithymia, identity, cause and emotional representations and lower levels of control were related to lower SWB levels. Thus, in line with the existing literature (17), our findings indicate that alexithymia may play an important role among persons with asthma. Furthermore, the associations we found between asthma illness representations and SWB support the SRM's postulations. Our findings suggest that it is the subjective perceptions of asthma, rather than the objective characteristics of the disease, that appears to determine SWB. However, it should be noted that apart from identity, cause, control and emotional representations, other illness representations were not related to SWB. Indeed, Hagger and Orbell (30) concluded in their review that different groups of people hold variations of illness beliefs. However, it is recommended that future studies will examine whether the illness representations of persons with asthma may predict SWB, using a longitudinal design.

In this study, coping strategies were not related to SWB in the regression model; thus, coping strategies were not examined as mediators between illness representations and SWB. Although a few studies (31,32) found some mediating effects of coping strategies in the framework of the SRM, our results contribute to the general finding that most relations between illness perceptions and outcomes cannot be explained by coping strategies (23). Furthermore, this finding is in line with Hagger and Orbell's (30) meta-analysis of the intercorrelations between the components of the SRM, which found no support for the hypothesis that coping strategies mediate the illness representations-illness outcome relationship.

Five main limitations regarding our study should be noted. First, the use of a convenience sample does not allow us to generalize the results, nor does it provide an accurate representation of all Israeli persons with asthma. Second, the quantitative survey method that was used did not allow respondents to expand on their views and experiences regarding their SWB. Third, objective characteristics of asthma were assessed based on the self-assessment of participants, which could represent a bias. Fourth, we did not ask participants about the duration they have asthma. Finally, the results may not be generalized to less affluent persons, males, and

older people due to the characteristics of the current sample and due to the way they were obtained (via Internet). It might be that persons recruited via Internet are different from those recruited in other ways (e.g. printed questionnaires).

Our findings suggest that clinical interventions targeting self-reported asthma and alexithymia may help persons with asthma to improve their SWB. In other words, these interventions should concentrate on helping persons with asthma reinforce their ability to identify and describe emotions (alexithymia), explore their perceptions regarding the identity of the disease and its causes, develop more positive perceptions regarding the ability to have control over the disease and its symptoms, and explore their emotional representations toward the disease.

Declaration of interest

The authors declare that they have no conflict of interest.

References

1. Wedzicha JA, Martinez FD. Asthma: Upcoming Themed Issue. 2018.
2. World Health Organization Asthma. Retrieved from <http://www.who.int/en/news-room/fact-sheets/detail/asthma>. 2019.
3. Drake SM, Simpson A, Fowler SJ. Asthma diagnosis: the changing face of guidelines. *Pulm Ther*. 2019;5(2): 103–15. doi:10.1007/s41030-019-0093-y.
4. Roddis JK, Holloway I, Bond C, Galvin KT. Living with a long-term condition: Understanding well-being for individuals with thrombophilia or asthma. *Int J Qual Stud Health Well-Being*. 2016;11(1):31530. doi: 10.3402/qhw.v11.31530.
5. Diener E. Subjective well-being. The science of happiness and a proposal for a national index. *Am Psychol*. 2000;55(1):34–43. doi:10.1037/0003-066X.55.1.34.
6. Ryff CD. Psychological well-being revisited: advances in the science and practice of eudaimonia. *Psychother Psychosom*. 2014;83(1):10–28. doi:10.1159/000353263.
7. Hughes M, Dunne M. The living with asthma study: issues affecting the perceived health and well-being of Irish adults with asthma. *Ir J Med Sci*. 2016;185(1): 115–20. doi:10.1007/s11845-014-1232-y.
8. Jones DR, Johnson JA, Graham-Engeland JE, Park CL, Smyth JM. Is perceived growth associated with momentary indicators of health and well-being in people with asthma or rheumatoid arthritis? *Appl Psychol Health Well-Being*. 2018;10(2):254–71. doi:10.1111/aphw.12129.
9. Thompson PJ, Salvi S, Lin J, Cho YJ, Eng P, Abdul Manap R, Boonsawat W, Hsu J-Y, Faruqi RA, Moreno-Cantu JJ, et al. Insights, attitudes and perceptions about asthma and its treatment: Findings from a multinational survey of patients from 8 Asia-Pacific

- countries and Hong Kong. *Respirology*. 2013;18(6):957–67. doi:[10.1111/resp.12137](https://doi.org/10.1111/resp.12137).
10. Xu X, O'Quinn S, Hirsch I, Gopalan G. Impact of asthma control status on lung function and patient well-being assessments in patients with severe, uncontrolled asthma. *Pneumologie*. 2018;72(S 01):P149. doi:[10.1055/s-0037-1619158](https://doi.org/10.1055/s-0037-1619158).
11. Leventhal H, Meyer D, Nerenz D. The common sense representation of illness danger. *Contributions to Medical Psychology*. 1980;2:7–30.
12. Moss-Morris R, Weinman J, Petrie KJ, Horne R, Cameron LD, Buick D. The revised Illness Perception Questionnaire (IPQ-R). *Psychol Health*. 2002;17(1):1–16. doi:[10.1080/08870440290001494](https://doi.org/10.1080/08870440290001494).
13. Achstetter LI, Schultz K, Faller H, Schuler M. Leventhal's common-sense model and asthma control: Do illness representations predict success of an asthma rehabilitation? *J Health Psychol*. 2019;24(3):327–36. doi:[10.1177/1359105316651332](https://doi.org/10.1177/1359105316651332).
14. Sofianou A, Martynenko M, Wolf MS, Wisnivesky JP, Krauskopf K, Wilson EAH, Goel MS, Leventhal H, Halm EA, Federman AD. Asthma beliefs are associated with medication adherence in older asthmatics. *J Gen Intern Med*. 2013;28(1):67–73. doi:[10.1007/s11606-012-2160-z](https://doi.org/10.1007/s11606-012-2160-z).
15. Sonney JT, Gerald LB, Insel KC. Parent and child asthma illness representations: a systematic review. *J Asthma*. 2016;53(5):510–6. doi:[10.3109/02770903.2015.1116088](https://doi.org/10.3109/02770903.2015.1116088).
16. Crowder SJ, Hanna KM, Carpenter JS, Broome ME. Factors associated with asthma self-management in African American adolescents. *J Pediatr Nurs*. 2015;30(6):e35–e43. doi:[10.1016/j.pedn.2015.03.005](https://doi.org/10.1016/j.pedn.2015.03.005).
17. Khosravani V, Alvani A, Bastan FS, Ardakani RJ, Akbari H. The alexithymia, cognitive emotion regulation, and physical symptoms in Iranian asthmatic patients. *Pers Individual Differences*. 2016;101:214–9. doi:[10.1016/j.paid.2016.05.364](https://doi.org/10.1016/j.paid.2016.05.364).
18. Larsen MH, Krogstad AL, Wahl AK. Alexithymia, illness perception and self-management competency in psoriasis. *Acta Derm Venerol*. 2017;97(8):934–40. doi:[10.2340/00015555-2707](https://doi.org/10.2340/00015555-2707).
19. Luminet O, Bagby RM, Taylor GJ. (Eds.). *Alexithymia: Advances in research, theory, and clinical practice*. Cambridge, UK: Cambridge University Press; 2018.
20. Maroti D, Lillengren P, Bileviciute-Ljungar I. The relationship between alexithymia and emotional awareness: A meta-analytic review of the correlation between TAS-20 and LEAS. *Front Psychol*. 2018;9:453. doi:[10.3389/fpsyg.2018.00453](https://doi.org/10.3389/fpsyg.2018.00453).
21. Hallas CN, Wray J, Andreou P, Banner NR. Depression and perceptions about heart failure predict quality of life in patients with advanced heart failure. *Heart Lung*. 2011;40(2):111–21. doi:[10.1016/j.hrtlng.2009.12.008](https://doi.org/10.1016/j.hrtlng.2009.12.008).
22. Fan SY, Eiser C, Ho MC, Lin CY. Health-related quality of life in patients with hepatocellular carcinoma: the mediation effects of illness perceptions and coping. *Psychooncology*. 2013;22(6):1353–60. doi:[10.1002/pon.3146](https://doi.org/10.1002/pon.3146).
23. Tiggelman D, van de Ven MO, van Schayck OC, Kleinjan M, Engels RC. The Common Sense Model in early adolescents with asthma: Longitudinal relations between illness perceptions, asthma control and emotional problems mediated by coping. *J Psychosom Res*. 2014;77(4):309–15. doi:[10.1016/j.jpsychores.2014.07.010](https://doi.org/10.1016/j.jpsychores.2014.07.010).
24. Veit CT, Ware JE. The structure of psychological distress and well-being in general populations. *J Consult Clin Psychol*. 1983;51(5):730–42. doi:[10.1037/0022-006X.51.5.730](https://doi.org/10.1037/0022-006X.51.5.730).
25. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *J Pers Soc Psychol*. 1989;56(2):267–83. doi:[10.1037/0022-3514.56.2.267](https://doi.org/10.1037/0022-3514.56.2.267).
26. Bagby RM, Parker JDA, Taylor GJ. The twenty-item Toronto Alexithymia scale-I. Item selection and cross-validation of the factor structure. *J Psychosom Res*. 1994;38(1):23–32. doi:[10.1016/0022-3999\(94\)90005-1](https://doi.org/10.1016/0022-3999(94)90005-1).
27. Valovirta E, Pawankar R. Survey on the impact of comorbid allergic rhinitis in patients with asthma. *BMC Pulm Med*. 2006;6(S1):S3. doi:[10.1186/1471-2466-6-S1-S3](https://doi.org/10.1186/1471-2466-6-S1-S3).
28. Cameron LD. Illness risk representations and motivations to engage in protective behavior: The case of skin cancer risk. *Psychol Health*. 2008;23(1):91–112. doi:[10.1080/14768320701342383](https://doi.org/10.1080/14768320701342383).
29. Komasi S, Saeidi M. A perceived risk factor may lead to increased anxiety and depression in cardiovascular patients. *Jundishapur J Chronic Dis Care*. 2016;5(4):e34159. doi:[10.17795/jjcdc-34159](https://doi.org/10.17795/jjcdc-34159).
30. Hagger MS, Orbell S. A meta-analytic review of the common-sense model of illness representations. *Psychol Health*. 2003;18(2):141–84. doi:[10.1080/088704403100081321](https://doi.org/10.1080/088704403100081321).
31. Krok D, Telka E, Zarzycka B. Illness perception and affective symptoms in gastrointestinal cancer patients: A moderated mediation analysis of meaning in life and coping. *Psycho-Oncology*. 2019;28(8):1728–34. doi:[10.1002/pon.5157](https://doi.org/10.1002/pon.5157).
32. Shinan-Altman S, Werner P, Cohen M. The connection between illness representations of Alzheimer's disease and burnout among social workers and nurses in nursing homes and hospitals: a mixed-methods investigation. *Aging Ment Health*. 2016;20(4):352–61. doi:[10.1080/13607863.2015.1008983](https://doi.org/10.1080/13607863.2015.1008983).