

Perceptions of Asthma Quality of Life in Children and Parent Dyads in Two Rural Counties in West Virginia

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Abstract

This study examines perceived quality of life (QOL) in a convenience sample of children (aged 7–11) with asthma and their parents from two schools in rural West Virginia. Forty-nine child–parent dyads representing 25 males and 24 females completed the study. The PedsQL™ 3.0 Asthma Module was utilized to separately measure child and parent perceptions of various dimensions of pediatric, asthma-specific, health-related QOL. Dimensions of the tool were scored separately and included symptoms, treatment, worry, and communication. The mean module dimension scores for children ranged from 63.27 to 80.47 and for parents, the range was from 61.26 to 79.79, with higher scores indicating higher QOL. Parents of male children perceived their son's QOL to be higher than that of female children in the symptoms and treatment dimensions. Strong relationships occurred between the child's worry and the other three dimensions as well as between the symptoms and the treatment dimensions. For the dyads, the only significant relationship was between the child and the adult treatment dimensions. With the well-documented burden of asthma in school-aged populations, information regarding the QOL of child and parent dyads will enhance school nurses' ability to improve health and educational outcomes in schools.

Keywords

asthma, quality of life, rural school-aged children/parents, PedsQL™ 3.0 Asthma Module

Introduction

Asthma is a reversible obstructive lung disease caused by reaction of the airways to a variety of stimuli. It is one of the most common chronic disorders in childhood. According to the Centers for Disease Control and Prevention (CDC), this chronic inflammatory condition involving acute exacerbations currently affects nearly 7 million children under 18 years (CDC, 2013).

In 2010, over 640,000 emergency room visits were due to asthma in those under 15 years (CDC, 2013). Generally, children see medical professionals for asthma management via routine and urgent care visits more often than adults. A potential indicator of poorly controlled asthma, urgent care and emergency department visits tend to be higher in children compared to adults as well as higher among Black and Hispanic adults and children compared to their White counterparts (CDC, 2013). Asthma exacerbations lead to work and school absenteeism and are one of the leading causes of missed days of school. In 2008, children aged 5–17 years who had one or more asthma attacks in the previous 12 months missed 10.5 million days of school (CDC, 2013). The burden of childhood asthma on the health care system, as well as on children and their families, is significant. In

fact, according to data from the CDC National Asthma Control Program (CDC, 2009), annual healthcare costs for asthma management were US\$56 billion, with the average yearly cost of care for a child with asthma being approximately US\$1,039 in 2009.

The direct and indirect (lost productivity from work and school) costs associated with hospital stays, emergency room visits, or primary care appointments are overwhelming. Clearly, asthma disrupts daily life. Even with proper management of asthma symptoms, children and their families often need to modify daily routines. Asthma episodes can be triggered by a variety of stimuli, including aeroallergens, strong odors, perfumes, weather conditions, exercise, air quality, colds, influenza infections, and heightened emotions (American Academy of Allergy, Asthma & Immunology, 2004; CDC, 2013). When asthma is poorly controlled,

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children are bothered by the physical symptoms, including chest tightness, cough, wheeze, and shortness of breath (CDC, 2013). Asthma symptoms may be predictable if triggers are known. Unfortunately, exposure to triggers cannot always be controlled, and the onset and frequency of asthma episodes can be unpredictable. Asthma episodes can be challenging and stressful for children and their families. In turn, these symptoms can impact the quality of life (QOL) of both children and their parents.

Review of the Literature

Many studies have been undertaken to determine predictors of QOL in children with asthma. Studies exploring asthma severity as associated with or predicting QOL in children have had contradictory results (Everhart & Fiese, 2009; Petsios et al., 2013). In a systematic review, QOL was related to asthma severity in 9 of 14 studies (Everhart & Fiese, 2009). When there was an association, source of information (parent or child) and type of QOL measure were found to influence the strength of the relationship. The authors recommended the use of an asthma-specific QOL measure in future studies. In a baseline study of a diverse sample of rural school-aged children (mean age 8.78 years), coping frequency (more frequent), asthma severity (more severe), and race/ethnicity (minority) significantly predicted the child's asthma-related QOL using the Pediatric Asthma QOL Scale (Juniper et al., 1996). Several studies have identified that perception of asthma control by children and their parents influenced perception of health-related QOL (HRQOL; Dean et al., 2010; Gandhi et al., 2013). In a large, cross-sectional, Internet-based survey, poorly controlled asthma symptoms impaired the HRQOL of both children and their caregivers (Dean et al., 2010).

Only one study addressed the agreement on HRQOL in the parent-child dyad (Petsios et al., 2011). The mean HRQOL scores for children living with asthma (ages 4–7 and 8–14) were significantly lower than their parents' perception of child's health HRQOL for all subscales except children with severe asthma in the older group. There was, however, moderate agreement between child self-reports and parent proxy reports (Petsios et al., 2011).

Several studies have examined the impact of an intervention program on the perception of QOL (Engelke, Swanson, & Guttu, 2014; Mandhane et al., 2010). In an educational program for children in Grades 2–5 during the preintervention period, parents rated their child's QOL higher than their child's ratings. The educational intervention was effective in decreasing the parent's QOL symptom assessment and was important in determining the child's asthma management. Parents' perception of the QOL, and not the child's, was associated with asthma management (Mandhane et al., 2010).

In a study examining the process and outcomes of a school nurse case management program for students with

asthma (Engelke et al., 2014), the investigators found baseline scores for the students were comparable to a normative group of children with moderate to severe persistent asthma (Chan, Mangione-Smith, Burwinkle, Rosen, & Varni, 2005), with an asthma symptom mean of 51.1 and a treatment mean score of 67.6. At the end of the case management program, there was a significant improvement from baseline in both the asthma symptom and the treatment problem scales of the PedsQL™ 3.0 SF22 Asthma Module Instrument (Chan et al., 2005).

Given the extent of asthma among school-age children and the potential impact on productivity and lost school days, assessment of asthma-related QOL from both the child's and the parent's perspectives may inform future interventions to improve QOL and asthma control. This study was undertaken to identify the asthma-related QOL as perceived by children and their parents and to determine whether there was an association between the two evaluations.

Method

Study Setting and Sample

After institutional review board and Board of Education approval, participants were recruited from two county primary schools in health professional shortage areas in rural West Virginia. Seventy-two letters were sent to parents/guardians of children who had an asthma action plan, as identified by the school nurse, inviting them to participate in the study. A reminder letter was sent home to the parents/guardians 2 weeks later. Fifty-nine parents returned consent forms and agreed to participate in the study. One child-parent dyad relocated, and nine children did not meet the age-inclusion criteria. A final sample of 49 child-parent dyads participated in the study.

Measures

Demographics were collected for each child by their respective school nurse. The PedsQL 3.0 Asthma Module (Varni, Burwinkle, Rapoff, Kamps, & Olson, 2004) was read to child participants by the school nurse and was sent home to parents for self-administration. The PedsQL 3.0 Asthma Module (Varni et al., 2004) is a 28-item, multidimensional instrument designed to measure pediatric, asthma-specific HRQOL. The module is comprised of four dimensions: asthma (11 items), treatment (11 items), worry (3 items), and communication (3 items). The asthma dimension focuses on problems related to asthma symptoms, such as chest pain or tightness, wheezing, and being able to take deep breaths. The treatment dimension concentrates on problems with medications, including administration, use, and side effects. In the worry dimension, the respondent is asked about problems with worry, as they relate to treatment side effects and effectiveness and worry about his or her asthma in general.

Lastly, the communication dimension focuses on problems the child has in talking to health care providers and others about his or her asthma (Varni et al., 2004).

Age-appropriate reports have been developed for 5–7, 8–12, and 13–18 years and for measuring parents' perceptions of their child's QOL in each of these age-groups. The child is asked to report how much of a problem each item has been to him or her over the past 1 month. Individual items in the module are scaled using a Likert-type response: 0 (*Never*), 1 (*Almost Never*), 2 (*Sometimes*), 3 (*Often*), or 4 (*Almost Always*); the parent module is scaled likewise. For the young child (aged 5–7) report, each item is scaled using a 3-point Likert-type response with 0 (*Not at all*), 2 (*Sometimes*), and 4 (*A lot*) for ease in answering. To score the instrument, each item is reverse scored and linearly transformed using a 0–100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, and 4 = 0), and the mean is imputed for each of the four dimensions, and no total score is calculated (Varni, 2014). Higher mean scores in each dimension indicate better HRQOL (fewer problems). In a study by Varni, Burwinkle, Rapoff, Kamps, and Olson (2004) involving 529 children with asthma and their families, internal consistency reliability for the PedsQL 3.0 Asthma Module was between .58 and .85 and between .82 and .91 for the child self-report and parent proxy reports, respectively, with strong construct (convergent) validity. Similar findings were reported in a study of 463 asthmatic adolescents, with Cronbach's α ranges from .79 to .87 for the adolescent self-report and .71 to .91 for the parent report (Chan et al., 2005).

Data Analyses

Data analyses were conducted using the Statistical Package for the Social Sciences (SPSS), Version 22 (IBM, 2013), and missing values were excluded from the analyses. Frequencies and descriptive statistics were completed on the demographic information collected on the 49 children. Mean scores for each of the dimensions of the PedsQL 3.0 Asthma Module (Varni et al., 2004) were calculated. Correlations were calculated between the demographic variables and the mean dimension scores (both child and adult). Paired sample *t* tests were analyzed on the dimension scores for child–parent dyads. Independent samples *t* tests were conducted on variables with significant bivariate correlations. For all tests, α was set at .05 for significance. Cronbach's α testing was analyzed on PedsQL 3.0 Asthma Module (Varni et al., 2004) dimension scores to measure internal consistency reliability of the instrument for this sample.

Results

The mean age of the children in this study was 9.59 (± 1.31) years. Gender was equally represented (male $n = 25$, female $n = 24$), with female child participants ($M = 9.92$ years) being slightly older than male child participants ($M = 9.28$ years). Overall, most of the children were White (87.7%)

Table 1. Demographics of Child Participants in the Asthma QOL Study.

Characteristics	<i>n</i>	Range	%
Age (years)			
Mean	9.59	7–11	N/A
SD	1.31		N/A
Gender			
Male	25	N/A	51.0
Female	24		49.0
Race/ethnicity			
White	43	N/A	87.8
Black	1		2.0
White/Black mix	5		10.2
Weight (pounds)			
Mean	89.16	44.5–240.0	N/A
SD	38.00		N/A
Height (inches)			
Mean	55.44	44.5–67.5	N/A
SD	4.59		N/A
BMI (m ²)			
Mean	19.68	13.2–37.0	N/A
SD	5.18		N/A
Number of school days absent			
Mean	6.82	0–26	N/A
SD	5.61		N/A
Comorbidities			
Yes	17	N/A	37.8
No	28		62.2
Allergies			
Yes	8	N/A	17.8
No	37		82.2
Lives with			
One parent	12		25.0
Two parents	36		75.0
Guardian	0		0.0

Note. *N* = 49. BMI = body mass index; QOL = quality of life.

and were living with two parents (75.0%). Most White children were living with two parents (83.3%), and most non-White children were living with one parent (83.3%). The mean number of school days missed was 6.82 with a range of 0–26 days, and the schools did not track the reason for missed school days. Other demographics are reported in Table 1.

The mean PedsQL 3.0 Asthma Module (Varni et al., 2004) dimension scores (child and adult) ranged from 61.26 to 80.47 (see Table 2), with higher scores indicating fewer problems and higher QOL. Cronbach's α s for the child mean scores ranged from .67 to .76 and were higher for the adult mean scores (.80 to .87; see Table 2).

Significant relationships were noted between child gender and both the adult asthma ($r = -.302$, $p < .05$) and the treatment ($r = -.332$, $p < .05$) dimension mean scores. Independent samples *t* tests indicated that parents of male children had significantly higher scores (higher perceived QOL) than parents of female children in both asthma, $t(47) = 2.170$, $p < .05$, and treatment dimensions, $t(47) = 2.412$,

Table 2. Scale Descriptive Statistics and Internal Consistency Reliability for the PedsQL™ 3.0 Asthma Module for Child-Parent Dyads in Two County Schools in Rural West Virginia.

Scale	Number of Items	Mean	SD	Cronbach's α
Child report				
Asthma symptoms	11	63.27	15.62	.76
Treatment problems	11	80.47	14.18	.75
Worry	3	74.32	20.19	.67
Communication	3	72.96	22.92	.70
Parent report				
Asthma symptoms	11	61.26	17.94	.87
Treatment problems	11	79.79	15.13	.80
Worry	3	75.51	24.38	.87
Communication	3	74.49	25.08	.86

Note. $N = 49$.

$p < .05$. With race recoded into White and non-White participants, a significant correlation was noted between child race and adult worry dimension mean scores ($r = -.285$, $p < .05$), however, an independent samples t test revealed no significant difference in the means, $t(47) = 1.568$, $p = .124$.

Correlations between mean dimension scores for the child-adult dyads are presented in Table 3. The strongest relationships ($r \geq .5$) were demonstrated between the child treatment and the child worry dimensions ($r = .665$, $p < .01$) and the child asthma and child treatment dimensions ($r = .663$, $p < .01$). Other strong correlations were noted between the child asthma and the child communication mean scores ($r = .564$, $p < .01$), child worry and child communication mean scores ($r = .535$, $p < .01$), and child asthma and child worry mean scores ($r = .511$, $p < .01$). Several moderate relationships ($.3 < r < .49$) were noted between mean dimension variables, including child-adult and adult-adult scores (see Table 3). For the dyads matched by dimension, the only significant relationship was noted between the child ($M = 80.47$) and the adult ($M = 79.79$) treatment mean scores ($r = .326$, $p < .05$). A paired samples t -test did not demonstrate a significant population mean difference in the dyads' treatment dimension scores, $t(48) = .282$, $p = .779$. A small, significant correlation was also noted between the number of school days absent and adult asthma dimension mean scores ($r = -.295$, $p < .05$).

Discussion

This descriptive study examined relationships between the perceptions of asthma-related QOL of children and their parents in two primary schools in health professional shortage areas in rural West Virginia. The PedsQL 3.0 Asthma Module (Varni et al., 2004) was used to describe the child's and parent's perceptions of problems with asthma symptoms and

asthma treatments. Additionally, aspects of worry and communication about problems with asthma were also identified.

In general, the children had high perceived mean QOL scores (63.27) as related to problems reported with asthma symptoms. These data are higher than baseline asthma symptom data (51.1) reported by Engelke, Swanson, and Guttu (2014), but surprisingly similar to child reports (63.7) after participation in a school-based, nurse-led case management program for children with asthma. In contrast, with a much larger sample, Chan, Mangione-Smith, Burwinckle, Rosen, and Varni (2005) described a wide range of asthma symptom scores while attempting to assess the reliability and validity of a short-form PedsQL 3.0 Asthma Module. Based upon asthma severity, scores ranged from 84.0 (mild intermittent) to 64.8 (mild persistent) and 50.5 (moderate/severe persistent; Chan et al., 2005). Interestingly, in our study, a small, significant correlation was also noted between the number of school days absent and adult asthma dimension mean scores, suggesting that the relatively low number of missed school days per year might relate to parent's perception of higher QOL with less need for the child to miss school.

Furthermore, in terms of problems with treatment, the mean QOL scores in our study were relatively high (80.47) in comparison to the baseline scores (67.5) for participants in the nurse case management program described by Engelke et al. (2014). The mean scores fell within the range of those reported by Chan et al. (2005), from 92.3 (mild intermittent) to 84.1 (mild persistent) and 79.6 (moderate/severe).

Our study found that the parents of male children perceived their sons' problems with asthma symptoms and treatment to have less impact on their sons' QOL than did parents of female children. The study findings are consistent with the results reported by Petsios et al. (2013), describing the tendency for parents, especially fathers, to overestimate their child's QOL, although their work did not differentiate parent responses by gender of the child. This tendency to overestimate was also described by Mandhane et al. (2010). While there is evidence to support gender differences in HRQOL in adults (Kynnyk, Mastronarde, & McCallister, 2011), there is limited information to describe gender differences in children. Do parents of male children overestimate because boys complain less and/or girls complain more? Are boys just expected to "tough it out?" The answers to these questions are difficult to interpret because early work described that girls with asthma tended to report lower HRQOL than boys (Warschburger et al., 2004). More recently, Petsios et al. (2013) observed that girls rated HRQOL higher than boys. This tendency to overestimate is an important consideration because parent's perceptions of severity and child QOL influence asthma management (Dean et al., 2010; Everhart & Fiese, 2009; Mandhane et al., 2010).

Table 3. Pearson's Correlations Between Child-Parent Dyads' PedsQL 3.0 Asthma Module Dimension Scores.

	Child Asthma Dimension	Child Treatment Dimension	Child Worry Dimension	Child Comm Dimension	Adult Asthma Dimension	Adult Treatment Dimension	Adult Worry Dimension	Adult Comm Dimension
Child asthma dimension	—	.663**	.511**	.564**	.162	.277	.140	.036
Child treatment dimension	.663**	—	.665**	.611**	.204	.326*	.223	.123
Child worry dimension	.511**	.665**	—	.535**	.136	.271	.083	.094
Child comm dimension	.564**	.611**	.535**	—	.137	.468**	.139	.215
Adult asthma dimension	.162	.204	.136	.137	—	.431**	.473**	.320*
Adult treatment dimension	.277	.326*	.271	.468**	.431**	—	.361*	.464**
Adult worry dimension	.140	.223	.083	.139	.473**	.361*	—	.140
Adult comm dimension	.036	.123	.094	.215	.320*	.464**	.140	—

Note. $N = 49$. Comm = communication dimension. Shading indicates child-parent dyad correlations in each dimension.

* $p < .05$. ** $p < .01$.

In our study, the strongest relationship occurred between the child worry and the child treatment dimension. These results were consistent with the findings reported by Petsios et al. (2013) who observed child worry scores to be significantly associated with corticosteroid use, asthma severity, number of doctor office visits, and lack of asthma control. In our study, additional strong relationships occurred among child's worry, communication, treatment dimensions, and asthma symptoms. These strong relationships were also identified in the adult responses in the treatment and worry dimensions as they related to asthma symptoms. These relationships are understandable because as symptoms become more problematic, the symptoms may lead to an increase in treatment and more opportunities for the child to interact with health care providers. Likewise, with the increase in symptoms, an association with worry may occur. Without more information about asthma severity in this population, it is difficult to draw conclusions about the data.

The only significant relationship for the dyads matched by dimension was between the child and the adult treatment means. The mean scores on this dimension for both parents and children were the highest. This finding is consistent with the results of the study by Petsios and colleagues (2013).

Strengths and Limitations

Our study is the first to examine perceptions of asthma-related QOL in child/parent dyads in the United States. This study used a valid and reliable tool. The use of such tools is a practice that is consistently identified in the literature as a key component to gathering QOL information about this population.

There were several limitations of this study. First, the small, homogeneous sample from only two schools limits the generalizability of the results. Additionally, while some demographic information was provided by the school nurse, it only involved the children and did not include information about medications or environmental triggers (like pets or secondhand smoke in the home). Objective criteria

documenting asthma severity would have enhanced the researchers' ability to draw conclusions about this population. Similarly, it would also have been helpful to have more demographic information about the parent completing the module. This information might have included gender, smoking status, and personal history of asthma.

Implications

These findings have the potential to be used by school nurses working with children who have asthma. As frontline health care providers, school nurses might consider using the PedsQL 3.0 Asthma Module (Varni et al., 2004) to assess QOL in child-parent dyads in school settings. Permission to duplicate and use the tool in school settings was received from James Varni (e-mail communication, August 14, 2014). School nurses have free access to the PedsQL Asthma Module (Varni et al., 2004) by going to www.pedsq.org and clicking on *Examination Copies*, which will link them to the PROQOLID website. They can then download the PedsQL Asthma Module, without a license fee, to augment the care they provide children.

The information obtained from the completed questionnaires could enable the nurse to establish interpersonal relationships to help children and their families share perceptions of QOL. With increased awareness of consistencies and/or discrepancies in perceptions of QOL, children and their parents might explore options with health care providers to potentially improve asthma management. Additionally, with more information about child and parent perceptions, the school nurse might offer health education to help families with acquiring knowledge that would influence attitudes, values, beliefs, behaviors, and practices related to living with asthma. Certainly, an interpersonal relationship with children and families would allow for the nurse to assume the role of case manager and to advocate for the child's needs in the school setting. Sharing the child's perception of his or her QOL with the parents might reveal issues of which they were not aware.

Conclusions

The parents and children in this study perceived the child's QOL to be relatively high. The children missed few days of school. The mean module dimension scores ranged from 61.26 to 80.47, with higher scores indicating higher QOL. Parents of male children perceived their son's QOL to be higher than that of female children in the symptoms and treatment dimensions. Strong relationships occurred between the child's worry and the other three dimensions as well as between the symptoms and the treatment dimensions. For the dyads, the only significant relationship was between the child and the adult treatment dimensions. With the well-documented burden of asthma in school-aged populations, information regarding the QOL of child and parent/guardian dyads will enhance school nurses' ability to improve health and educational outcomes in schools.

Authors' Note

The authors dedicate this article to their late friend and colleague, Dr. Heidi Putman-Casdorph. Heidi devoted her career to asthma research, and this article is the final tribute to her efforts. We are honored to have had the opportunity to know her.

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References

- American Academy of Allergy, Asthma & Immunology. (2004). *Pediatric asthma: Promoting best practice for managing asthma in children*. Milwaukee, WI: Author.
- Centers for Disease Control and Prevention. (2009). *Asthma's impact on the nation: Data from the CDC National Asthma Control Program*. Retrieved from http://www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf
- Centers for Disease Control and Prevention. (2013). *Asthma facts: CDC's National Asthma Control Program Grantees*. Retrieved from http://www.cdc.gov/asthma/pdfs/asthma_facts_program_grantees.pdf
- Chan, K. S., Mangione-Smith, R., Burwinkle, T. M., Rosen, M., & Varni, J. W. (2005). The PedsQL™: Reliability and validity of the Short-form Generic Core Scales and Asthma module. *Medical Care*, 43, 256–265. doi:10.1097/00005650-200503000-00008
- Dean, B. B., Calimlim, B. C., Sacco, P., Aguilar, D., Maykut, R., & Tinkelman, D. (2010). Uncontrolled asthma: Assessing quality of life and productivity of children and their caregivers using a cross-sectional internet-based survey. *Health and Quality of Life Outcomes*, 8, 96–105. doi:10.1186/1477-7525-8-96
- Engelke, M. K., Swanson, M., & Guttu, M. (2014). Process and outcomes of school nurse case management for students with asthma. *Journal of School Nursing*, 30, 196–205. doi:10.1177/1059840514507084
- Everhart, R. S., & Fiese, B. H. (2009). Asthma severity and child QOL in pediatric asthma: A systematic review. *Patient Education and Counseling*, 75, 162–168. doi:10.1016/j.pec.2008.10.001
- Gandhi, P. K., Kenzik, K. M., Thompson, L. A., DeWalt, D. A., Revicki, D. A., Shenkman, E. A., & Huang, I.-C. (2013). Exploring factors influencing asthma control and asthma-specific health-related quality of life among children. *Respiratory Research*, 14, 26–35. doi:10.1186/1465-9921-14-26
- IBM. (2013). *IBM SPSS Statistics (Version 22)* [Computer Software]. Armonk, NY: Author.
- Juniper, E. F., Guyatt, G. H., Feeny, D. H., Ferrie, P. J., Griffith, L. E., & Townsend, M. (1996). Measuring quality of life in children with asthma. *Quality of Life Research*, 5, 35–46.
- Kynnyk, J., Mastronarde, J., & McCallister, J. (2011). Asthma, the sex difference. *Current Opinions in Pulmonary Medicine*, 17, 6–11.
- Mandhane, P. J., McGhan, S. L., Sharpe, H. M., Wong, E., Hessel, P. A., Befus, A. D., & Majaesic, C. (2010). A child's asthma quality of life rating does not significantly influence management of their asthma. *Pediatric Pulmonology*, 45, 141–148. doi:10.1002/ppul.21157
- Petsios, K. T., Priftis, K. N., Hatziagorou, E., Tsanakas, J. N., Antonogeorgos, G., & Matziou, V. N. (2013). Determinants of quality of life in children with asthma. *Pediatric Pulmonology*, 48, 1171–1180. doi:10.1002/ppul.22768
- Petsios, K. T., Priftis, K. N., Twoumakes, C., Hatziagorou, E., Tsanakas, J. N., Galanis, P., . . . Matziou, V. (2011). Level of parent-asthmatic child agreement on health-related quality of life. *Journal of Asthma*, 48, 286–297. doi:10.3109/02770903.2011.555031
- Varni, J. W. (2014). *Scaling and scoring of the Pediatric Quality of Life Inventory™ PedsQL™*. Lyon, France: Mapi Research Trust.
- Varni, J. W., Burwinkle, T. M., Rapoff, M. A., Kamps, J. L., & Olson, N. (2004). The PedsQL™ in pediatric asthma: Reliability and validity of the Pediatric Quality of Life Inventory™ Generic Core Scales and Asthma module. *Journal of Behavioral Medicine*, 27, 297–318. doi:10.1023/B:JOBM.0000028500.53608.2c
- Warschburger, P., Busch, S., Bauer, C. P., Kiosz, D., Stachow, R., & Petermann, F. (2004). Health-related quality of life in children and adolescents with asthma: Results from the ESTAR Study. *Journal of Asthma*, 41, 463–470. doi:10.1081/JAS-120033989

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