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## Improving the Healthcare Transition for Adolescents with Asthma: Implementing a Transition Readiness Assessment

Andrea Pauley

University of Kentucky, [andreapauley6@gmail.com](mailto:andreapauley6@gmail.com)

Author ORCID Identifier: <https://orcid.org/0000-0003-4178-6161>

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**Improving the Healthcare Transition for Adolescents with Asthma: Implementing a  
Transition Readiness Assessment**

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing  
Practice at the University of Kentucky

By

Andrea L. Pauley, BSN, RN, CPN

Lexington, KY

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## **Abstract**

**BACKGROUND:** Asthma is the most common pediatric chronic disease in the United States and adolescence represents the highest prevalence among all age groups. Transition planning is recommended for all adolescents, especially those with special health care needs (SHCN). Only 17% of adolescents with SHCN receive adequate transition planning. **PURPOSE:** The purpose of this study was to implement the Transition Readiness Assessment Questionnaire (TRAQ) for adolescents age 12 years and older with asthma to identify the current level of transition readiness and identify factors associated with readiness. **METHODS:** This study was an exploratory, cross-sectional design to evaluate and describe participants' level of transition readiness and identify factors associated with readiness. The TRAQ was used as a measure and a chart review was conducted to collect age, sex, race, duration of asthma diagnosis, and frequency of visits from all participants. **RESULTS:** There were 34 participants, with an average age of 14.6 years and 51.5% were White. On average participants scored 3.14 on the TRAQ. There was a small to moderate, positive, and marginally significant association between overall TRAQ score and age. There was no association between overall TRAQ score and sex, race/ethnicity, and years since diagnosis. Frequency of visits did not contribute to study findings. **CONCLUSIONS:** Adolescents with asthma are not fully prepared to transition to adult healthcare. Transition readiness should be regularly assessed and interventions should be implemented to increase readiness. Further research is needed to identify other factors that are associated with readiness and evaluate interventions that aim to improve readiness.

## **Acknowledgements**

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Finally, I would like to express my gratitude to the faculty and staff within the College of Nursing that I have worked with during my time in this program. Your dedication to my success as a student is so appreciated. To my clinical preceptors, thank you for the wonderful experiences and training you provided; I will be a better nurse practitioner because of you. I would also like to thank Dr. Amanda Thaxton-Wiggins for her assistance and expertise on data analysis.

## **Dedication**

First, I would like to dedicate this manuscript to all adolescents who are navigating the challenges associated with this unique stage of development. I have been passionate about this population since early in my nursing career. It is my hope that this project and my future work will enhance the care of adolescents with special health care needs and allow for a successful transition to adult health care services.

I would also like to dedicate this manuscript to my parents who have provided endless support, love, and motivation throughout my life and educational journey. To my sister, who let me practice on her and pushed me to keep going. To my soon to be husband, I am grateful for your support over the last three years and look forward to spending much more time together, without the stress of deadlines and assignments. My success in this program would not have been possible without all of you and I am eternally grateful for your support and encouragement.

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## **Background and Significance**

### **Introduction to Problem**

Asthma is the most common pediatric chronic disease in the United States and adolescence represent the highest prevalence among all childhood age groups (CDC, 2020). This stage of development is associated with challenges related to increasing independence, identity development, and exposure to high-risk behaviors (Withers & Green, 2019). In addition to these unique concerns, adolescents are also entering a time where they are expected to leave their pediatric providers and transition to adult health care services. This time of transition presents an opportune moment to assess their understanding of needed skills and knowledge of asthma management prior to leaving pediatric care.

### **Context, Scope, and Consequences**

Health care transition is defined as “the purposeful, planned movement of adolescents and young adults with chronic physical and medical conditions from child-centered to adult-oriented healthcare systems” (Blum et al., 1993, p. 570). Adolescents with asthma have special health care needs that require a smooth, coordinated, and successful transition to adult health care services to ensure their health care needs continue to be met. Understanding their condition, treatments, and developing self-management skills are critical elements for successful management for the adolescent with asthma (Withers & Green, 2019).

According to the National Survey of Children’s Health, only 17% of youth with special health care needs and 14% of those without special health care needs are receiving adequate guidance for planning their health care transition (Lebrun-Harris et al., 2018). Adolescents with asthma who require specialist care represent an important subgroup who may be at an increased risk for complications during the transition process. While remission does occur with childhood

asthma, these adolescents and young adults are at increased risk for later developing chronic obstructive pulmonary disease and for recurrence of asthma as an adult (Withers & Green, 2019). Without structured health care transition planning, adolescents are at an increased risk for medical complications, low medication and treatment adherence, discontinuity of care, increased emergency and hospital care utilization, and increased costs of care (White & Cooley, 2018).

### **Current Evidence-Based Interventions**

The Society for Adolescent Medicine, American Academy of Pediatrics, American Academy of Family Physicians, and American College of Physicians have developed guidelines for transition planning and highlighted the importance of this process for all adolescents, especially those with special health care needs (Withers & Green, 2019). Additionally, “Got Transition®” is a federally funded national resource center on transition planning for health care professionals, adolescents, and their families. This resource center outlines the six core elements of transition, which are widely accepted as the optimal approach by the above-mentioned organizations. These elements include transition and care policy, tracking and monitoring, transition readiness assessment, transition planning, transfer of care, and transfer completion (Got Transition, 2014). However, rates of transition planning remain low and there is little evidence or guidance specific to transitioning adolescents with asthma, despite the high prevalence of this chronic condition and evidence-based strategies available (Withers & Green, 2019).

### **Purpose and Objectives**

The purpose of this project was to implement a transition readiness assessment tool for adolescents ages 12 and older with asthma within an urban pediatric pulmonology clinic. By assessing readiness, this study aimed to describe the current level of readiness among this

population and identify any factors associated with increased readiness. The clinic where implementation occurred did not previously screen patients for transition readiness and this implementation will be the first step towards ensuring this population is receiving optimal transition planning. Beginning transition planning early in adolescence has been proven to assist youth develop self-care, self-advocacy, and decision-making skills, which are all necessary for entering adult health care services (Jensen et al., 2017). By assessing transition readiness, adolescents and their pediatric providers can begin to have discussions about their current level of readiness and plan for the eventual transition to adult health care. Additionally, providers can gain a better understanding of their patients' needs related to transition.

There were two specific aims for this project. By May 2022, 60% of identified adolescents age 12 years or older with an asthma diagnosis seen in the pulmonology clinic will be screened for transition readiness using the Transition Readiness Assessment Questionnaire (TRAQ). By May 2022, relationships will be defined between TRAQ score and demographic or clinical characteristics including age, sex, race, duration of asthma diagnosis, and frequency of visits.

### **Theoretical Framework**

The Transitions Theory developed by Dr. Afaf Meleis and colleagues argues that all transitions have essential properties including awareness, engagement, change and difference, time span, and critical points and events (Meleis et al., 2000). Meleis also argues that transition periods increase vulnerability to health risks and nursing interventions can impact the outcome of a transition. This theory also states that feeling connected, interacting, being situated, and developing confidence and coping are four process indicators of a healthy transition (Meleis et

al., 2000). These process indicators can help guide interventions to aid adolescents in their transition to adult health care services.

To guide the implementation of a transition readiness assessment, the Transitions Theory was used as a theoretical framework. This project was guided by the Transitions Theory by focusing on the universal properties of transitions and the process indicators of a successful transition. Through assessing transition readiness adolescents should be more connected and interactive with their providers during this critical period. Additionally, identifying potential areas of weakness in transition readiness, adolescents will have the opportunity to improve their skills and develop confidence.

### **Review of Literature**

Due to low rates of transition planning in the United States, a literature review was conducted to determine the current state of evidence for transition readiness and planning for the adolescent with asthma. This review was guided by the question, how does a transition readiness assessment implementation, compared to usual care (no intervention) affect the transition experience of adolescents with asthma? PubMed and CINAHL were searched using the terms, transition readiness assessment, transition to adult care, asthma, and transition readiness. There were 96 articles reviewed and 12 were selected using inclusion criteria of transition readiness assessments, perceptions on transition, adolescents and young adults, and asthma. Studies were excluded if they focused on specific chronic diseases other than asthma and were published more than ten years ago.

### **Synthesis of Evidence**

This review included five systematic reviews, two randomized controlled trials, and the remaining were lower levels of evidence. Only four studies solely focused on asthma, while the

remaining discussed adolescents in general or adolescents with various chronic medical conditions. Several researchers found that adolescents and their parents perceive the transition to adult care to be challenging and transition planning or readiness assessment was suboptimal (Heath et al., 2017; Lebrun-Harris et al., 2018; Ödling et al., 2020; Vazquez-Ortiz et al., 2020). However, researchers also found those adolescents with medical conditions and higher rates of health care utilization had enhanced transition readiness (Eaton et al., 2017; Traino et al., 2021a). Additionally, there were numerous factors associated with improved transition readiness including receiving transition anticipatory guidance, females with chronic conditions, increased resilience, higher median household income, and private insurance (Javalkar et al., 2016; Syverson et al., 2016; Varty & Popejoy, 2020; Verma & Rohan, 2020).

Specific to asthma, researchers found adolescents set both short- and long-term goals related to their disease but still desire support from parents and caregivers (Gibson-Scipio et al., 2015). This finding shows the importance of involving the adolescent and their family in the planning of their transition. However, researchers also found that higher scores on the TRAQ were not necessarily a reliable indicator of the adolescent's ability to fully manage their care (Jones et al., 2019). They recommended using the assessment to guide counseling and discussion of transition planning. Similarly, two studies found that further research is needed to develop and validate transition readiness tools. However, the TRAQ is a validated generic tool that can be used across various disease states (Schwartz et al., 2014; Stinson et al., 2014).

### **Identification of Gap**

There is very limited evidence surrounding transition readiness for asthma specifically. Most available evidence either focuses on other disease states or adolescents in general. As asthma is the most common chronic pediatric condition it represents an opportunity to evaluate

transition readiness in this large subgroup of the adolescent population. More evidence specific to asthma and transition readiness is needed. Currently, transition planning and transition readiness assessment occurs at a low rate in the adolescent population and even lower rates in those with asthma, which represents a gap in practice. Additionally, adolescents and their parents perceive this transition period as challenging, yet many providers are not implementing current guideline recommendations related to transition planning.

This proposed DNP project seeks to address the gap of low rates of transition planning and readiness assessments by implementing a transition readiness assessment for adolescents with asthma. By evaluating the transition readiness of adolescents with asthma it will allow providers to begin the conversation with adolescents and their parents about this eventual transition. This project will add to the limited body evidence regarding adolescents with asthma and transition readiness.

### **Methods**

This DNP project was designed as an exploratory, cross-sectional study to evaluate and describe participants' transition readiness based on the TRAQ score and identify any factors associated with increased readiness. This study seeks to describe the current level of transition readiness for adolescents with asthma. The TRAQ tool was administered in a pediatric pulmonology clinic to eligible and consenting participants to evaluate their readiness to transition. Prior to this study, the clinic did not screen for transition readiness. Project implementation took place in the exam rooms at Norton Children's Pulmonology clinic during regularly scheduled appointment times. Norton Children's Pulmonology has two locations, the Novak Center for Children's Health, and a satellite office at Norton Medical Plaza II. Study

approval was obtained through the University of Kentucky IRB on November 11, 2021, under protocol #70479. Additional approval was obtained from the Norton Healthcare Research Office.

### **Setting**

Norton Children's Pulmonology is affiliated with the University of Louisville (UofL) School of Medicine. The primary office is in downtown Louisville, KY within the Novak Center for Children's Health. This is newly constructed multidisciplinary facility that began operating in 2018 and houses over 30 specialties. It is located one block from Norton Children's Hospital and is one of the largest and most technically advanced pediatric outpatient centers in the United States (Norton Children's, 2018). The satellite office is located at the Norton Brownsboro campus, 20 minutes from downtown Louisville. At the time of data collection, the pulmonology practice consisted of five physicians, two nurse practitioners, respiratory therapists, medical assistants, and a certified asthma educator. The pulmonologists are board certified by the American Board of Pediatrics (Norton Children's, 2021).

### **Project Congruence**

This project aligned with both organizations' mission and values that are affiliated with Norton Children's Pulmonology, Norton Healthcare, and UofL. Norton Healthcare's mission is to provide quality health care to all those served, in a manner that responds to the needs of the communities and honors our faith heritage. Their vision is to be the region's most comprehensive, strongest, and preferred health care organization, setting the standard for quality and caring (Norton Healthcare, 2021). The UofL, Department of Pediatrics vision is to be a center of excellence in children's healthcare, in partnership with Norton Children's Hospital, through provision of evidence-based, patient-centered, high quality, high value diagnostic, therapeutic, and preventive health services (University of Louisville, 2017). This project sought

to implement an evidence-based transition readiness assessment for adolescents with asthma and evaluate the current level of transition readiness in this population. This activity aligns with the mission of both organizations by introducing an evidence-based and patient centered approach to assessing transition readiness.

### **Stakeholders**

The stakeholders involved in this project included both the adolescent and their parents or guardians. When considering the transition to adult health care services, the adolescent should be the primary focus, but it is likely that the caregiver is still highly involved with their care. Additionally, the nurse practitioner in the clinic who served as the clinical mentor for this project committee was a very important stakeholder and was necessary to identifying eligible participants, access data, and provide expertise and insight into the setting where the project occurred. Both organizations and the primary investigator's academic institution, University of Kentucky, are also stakeholders in this project.

### **Facilitators and Barriers**

Site-specific facilitators to this project included the mentorship from a nurse practitioner who works in the clinic with the target population. She had previous experience mentoring students completing DNP projects and was an asset to this project by providing expertise and access to the clinic and staff. This relationship helped facilitate recruitment, engagement with key stakeholders, and data collection. An additional facilitator was the clinic's partnership with a large children's hospital and UofL. With these partnerships, the clinic was familiar with evidence-based initiatives taking place in their setting, which facilitated their engagement in this DNP project. Another facilitator was the primary investigator who had access to the electronic

health record system that the clinic uses, which allowed for accurate identification of potential participants and data collection.

Barriers to this project included the clinic schedule. Much of the sample was limited to the nurse practitioner's patient panel because of clinic schedules and other providers seeing patients with other pulmonary diseases. Another barrier was the patient population during the project period. This clinic sees pediatric patients with a wide variety of pulmonary issues. Many patients seen in clinic during the project were of a younger age or had other pulmonary diseases than asthma, which affected sample size. The influx of patients, especially in the adolescent age range, being referred to pulmonology for lasting symptoms of COVID-19 certainly affected the sample size.

## **Sample**

A convenience sample was used to obtain participants in the project. The primary investigator attended clinic with the nurse practitioner mentor and much of the sample came from her clinic schedule. The target population included patients ages 12 years and older, who lived in Kentucky, had an asthma diagnosis, and were seen in the pulmonology clinic from November 11, 2021 through February 28, 2022. Inclusion criteria included being at least 12 years of age, having been previously diagnosed with asthma, and live in the state of Kentucky. Exclusion criteria include being less than 12 years of age, have other complex pulmonary disorders, require an interpreter, and live outside of Kentucky. Based on the schedule review, 85 potentially qualifying patients were identified. Three qualifying patients declined to participate in the study. There were 34 adolescents who enrolled in the study and completed the TRAQ tool. The primary investigator was authorized to obtain consent and did so for all qualifying adolescents. Written consent was obtained from the legal guardian of all participants less than 18

years of age, as well as written assent from adolescents less than 18. Written consent was obtained from all participants aged 18 and older.

## **Procedure**

This project included the implementation of a validated transition readiness assessment tool, the TRAQ. Eligible participants were identified from the clinic schedule. During the eligible participants' visit the nurse practitioner inquired if the patient would be interested in participating in a research study about transition readiness. If they indicated they were interested, the primary investigator then entered the room. A description of the study was provided and if they were willing to participate, the appropriate consent and assent documents were obtained. The primary investigator then provided the adolescent with the TRAQ tool for them to complete. Following completion of the TRAQ tool, a chart review was performed to obtain study variables from the participants' electronic medical record.

## **Measures and Instrument**

Demographic data was obtained through chart review of the medical record including age, sex, race, duration of asthma diagnosis, and frequency of visits to the pulmonology practice. The total TRAQ score and mean scores of TRAQ domains were calculated as a measure as well. The TRAQ 5.0 tool was chosen to measure transition readiness. The TRAQ is a validated 20-question, five domain, self-administered screening tool. The five subscales within the TRAQ include, managing medications, appointment keeping, tracking health issues, talking with providers, and managing daily activities. This tool has high reliability with a Cronbach's alpha of 0.94 and good reliability for 4 of the 5 subscales. One subscale, Managing Daily Activities, had a Cronbach's alpha of 0.67 (Wood et al., 2014). The question response options were designed to represent the five stages of change from the Transtheoretical Model (Sawicki et al., 2011). The

responses are recorded using a 5-point Likert scale (1 = No, I do not know how; 2 = No, but I want to learn; 3 = No, but I am learning to do this; 4 = Yes, I have started doing this; and 5 = Yes, I always do this when I need to). The maximum total score is 100, with a minimum total score of 20 (see Appendix A).

### **Data Analysis**

Descriptive statistics, including frequency distribution, mean, standard deviation, median, and interquartile range, were computed for age, sex, race, duration of asthma diagnosis, and overall TRAQ score. Mean scores of each TRAQ domain were also determined. Bivariate statistics were used to determine the relationship between demographic and clinical characteristics with overall TRAQ score. Gender and TRAQ score were analyzed using a two sample t-test. Age and TRAQ score were analyzed using Pearson's correlation coefficient. Years since diagnosis and TRAQ score were analyzed using Spearman's rank correlation coefficient. While frequency of visits was collected via chart review, during the analysis process the data was deemed challenging to analyze due to inconsistency in follow-ups and missing data. This variable did not contribute to the study's findings. Data was analyzed with SPSS software provided by the University of Kentucky.

### **Results**

There were 34 adolescents who enrolled in the study and completed the TRAQ tool. There were 85 patients identified that met inclusion criteria, 37 adolescents were invited to participate in the study, and only three declined. The large discrepancy between those who met criteria and participated was due to no-shows and cancelled appointments. Of those contacted to participate, there was a 91.9% participation rate. Table 1 depicts the demographic, clinical characteristics, and TRAQ scores for all participants. Among the 34 participants, the average age

was 14.6 years (SD=2.1; see Table 1). Slightly more than half of the participants were female (56%) and about half of the participants were White (51.5%). The median time since asthma diagnosis was 8 years (IQR: 6-9). When scoring 20-100 on the TRAQ, the participants scored an average of 62.9 (SD=17.8) and the mean overall TRAQ score was 3.14 (SD=0.89). The mean score for managing medications was 3.3 (SD=1.0), appointment keeping 2.6 (SD=1.2), tracking health issues 2.5 (SD=1.2), talking with providers 4.5 (SD=0.66), managing daily activities 4.1 (SD=0.83).

In the bivariate analysis, there was a small to moderate, positive, and marginally significant association between age and overall TRAQ score ( $r = .34, p = .053$ ; see Table 2). There was no association between sex, race/ethnicity, and years since diagnosis and overall TRAQ score. Table 2 depicts results from the bivariate analysis.

### **Discussion**

While a coordinated, age appropriate, and evidence-based transition to adult health care services is needed for all adolescents, those with chronic health conditions like asthma are of utmost importance (Nanzer et al., 2021). Since asthma continues to be the most common chronic disease in childhood and affects over 300 million adults worldwide, this is a critical population to focus transition efforts toward. Unfortunately, many adolescents with asthma are not receiving transition planning in accordance with guideline recommendations (Withers & Green, 2019). The results of this study highlight the importance of improving transition efforts among this vulnerable population.

The study results demonstrate the current level of readiness for transition among this small sample of adolescents with asthma. Overall, the adolescents scored just above 60 on the TRAQ tool or an average of 3.14. This indicates that this sample population were on average in

the preparation stage when considering the Transtheoretical Model as answer choices. This indicates the need for further intervention and support for these adolescents as they continue their journey to transitioning to adult health care services. This study provides a fairly diverse sample of the current level of transition readiness among adolescents with asthma. This is an important first step to improving the healthcare transition among this subgroup of adolescents living with chronic conditions.

When considering the five domains of the TRAQ, it is clear there are some areas where adolescents with asthma are more prepared for transition than others. The highest scoring domain was talking with providers, indicating adolescents feel comfortable communicating with their providers and are doing so. This is consistent with results from other studies focused on various chronic health conditions in adolescents (Traino et al., 2021b; Jones et al., 2019; Patel et al., 2019). Similarly, the lowest scoring domains were tracking health issues and appointment keeping. When planning transition planning interventions, it is important to consider the areas in which adolescents need the most assistance and education. Many of the items in the two lowest scoring domains are activities that the adolescent is most likely relying on their parent or caregiver for. Partnering with the parent or caregiver to assist the adolescent in adopting new behaviors is crucial to increase transition readiness.

In addition to describing transition readiness in this population, this study sought to identify any factors that were associated with increased readiness. The results showed a correlation between age and overall TRAQ score. Previous studies on conditions other than asthma have found similar findings (Oberoi et al., 2022; McColl et al., 2021; Javalkar et al., 2016; Rosen et al., 2016). However, there are some conflicting results that indicate no relationship between TRAQ scores and age, gender, or race (Jensen et al., 2017). The results

from this study showed there was not a correlation found between overall TRAQ score and sex, race/ethnicity, or years since diagnosis. While this could be due to the small sample size, it is important to consider there are numerous factors that may impact an adolescent's readiness to transition. This highlights the importance of an individualized, patient-centered approach to transition planning.

### **Implications**

There are numerous clinical and future research implications from this study. The results from this study show a need for improved education in the domains of managing medications and appointment keeping for adolescents with asthma. These two domains address skills such as, calling provider offices, following up on referrals or labs, health insurance, filling and reordering prescriptions, taking medications, and dealing with reactions to medications (Wood et al., 2014). Discussing these topics with the adolescent and their caregivers should be a priority during follow-up visits, along with regular use of the TRAQ to identify patient specific gaps in readiness. This discussion could be facilitated by the provider, a social worker, or nursing staff. Additionally, clinics or healthcare organizations could host monthly or quarterly educational offerings focused on skills related to transition skills for adolescents, either in person or via video conferencing.

During this study, developers of the TRAQ published an updated TRAQ 6.0 to improve the measurement precision of this tool (Johnson et al., 2021). For future studies, this updated tool should be utilized. Additionally, incorporating a longitudinal design coupled with educational interventions would provide insight to adolescents' progression through the transition process, effectiveness of education, and further identify areas of improvement needed among adolescents with asthma. Future studies are also needed to determine how transition readiness is associated

with clinical outcomes throughout and beyond transition, such as healthcare utilization, medication adherence, and asthma exacerbations.

While this study did not find any association between transition readiness and sex, race/ethnicity, or duration of diagnosis, future studies should continue to identify factors that are associated with increased readiness. Varty & Popejoy (2020) conducted a systematic review to analyze factors that were associated with transition readiness in youths with chronic diseases. The results showed age and female gender were associated with transition readiness across multiple studies and populations. There were numerous modifiable and non-modifiable factors found, however many were only studied in a single cross-sectional study. Further research should be conducted to determine additional factors that are associated with transition readiness in adolescents with asthma to assist in designing interventions and assessing for risk of low readiness.

Anecdotally, while conducting this study many parents and adolescents commented on the importance of transition planning and the lack of transition planning, they have experienced either with the study participant or another child. Parents also expressed the desire for more information and education on how they could help their adolescent better prepare for transition. There were also some very powerful discussions between the parent and participant while completing the TRAQ. Parents would reinforce behaviors their adolescent had mastered, encourage their adolescent they were capable of certain behaviors, and discuss how they could work on behaviors together to help their adolescent gain more independence. While this study did not include qualitative measures, future studies may be needed on perspectives and opinions regarding healthcare transition. Overall, these comments and conversations indicate a level of interest and need for improved transition planning efforts.

## **Limitations**

One primary limitation of this study is related to the sample population. The small sample size, convenience sampling technique, and sampling occurring within only two clinic sites in an urban city in Kentucky limit the generalizability of these findings. The sample size was limited to the patients seen in clinic during the data collection period. Since the COVID-19 pandemic, the clinic experienced a large increase in patients being referred for post-COVID pulmonary symptoms, thus reducing the proportion of asthma follow-up appointments. Additionally, many of the participants screened either cancelled or did not show for their scheduled appointment. The high no-show rate certainly limited the study population and is not uncommon among those with a chronic disease. A larger sample size and one from various clinics would allow for further insight into transition readiness among adolescents with asthma, as well as characteristics that are associated with increased readiness.

Additionally, this study was cross-sectional and only describes the current level of transition readiness during the data collection phase. Implementing a longitudinal study in conjunction with motivational interviewing would allow for more insight to how adolescents' transition readiness changes over time. Another limitation of this study is the self-reported nature of the TRAQ. With any assessment that includes self-reported answers, there is a risk of social desirability bias. While the primary investigator informed participants there were no right or wrong answers, there is a possibility some adolescents rated their abilities higher than they were. This bias is discussed in the report on the TRAQ's factor structure, reliability, and validity (Wood et al., 2014). The authors note that while the TRAQ is subject to bias, the adolescent's self-report is an important perspective. For future studies it would be beneficial to employ external observation to validate adolescents' self-reported answers.

## **Conclusion**

The study provides further insight into transition readiness for adolescents with asthma and adds to the limited body of evidence surrounding this population and transition. The main purpose was to evaluate the current level of transition readiness among adolescents with asthma and determine if any relationships exist between transition readiness and demographic or clinical characteristics. The results of this study further support the literature that show a need for increased and improved transition planning efforts. Based on the sample population, adolescents with asthma have not fully mastered the skills needed to transition. Considering the risks associated with this developmental stage, low rates of transition planning, and health risks associated with lack of structured transition planning, it is imperative that adolescents with asthma are regularly assessed for transition readiness and provided with preparation for their eventual transition.

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**Table 1. Demographic, clinical characteristics, and TRAQ score (N = 34)**

Variable	Mean (SD), n (%) or median (IQR)
Age	14.6 (2.1)
Sex	
Female	19 (55.9%)
Male	15 (44.1%)
Race/Ethnicity	
White	17 (51.5%)
Black	13 (39.4%)
Hispanic	1 (3%)
Other	2 (6.1%)
Time since diagnosis	8 (6 – 9)
TRAQ overall score	62.9 (17.8)
Mean overall TRAQ score	3.14 (0.89)
Managing Medications	3.3 (1.0)
Appointment Keeping	2.6 (1.2)
Tracking Health Issues	2.5 (1.2)
Talking with Providers	4.5 (0.66)
Managing Daily Activities	4.1 (0.83)

**Table 2. Associations among demographic/clinical characteristics and TRAQ score (N = 34)**

	TRAQ score	<i>p</i>
	test statistic	
Age	$r = .34$	.053 <sup>a</sup>
Sex		.97 <sup>b</sup>
Male	$M = 63.0, SD = 16.6$	
Female	$M = 62.7, SD = 19.9$	
Race/ethnicity		.57 <sup>c</sup>
White	$M = 65.53, SD = 17.3$	
Black	$M = 58.5, SD = 18.1$	
Hispanic or other race	$M = 60.7, SD = 23.1$	
Years since diagnosis	$\rho = .11$	.56 <sup>d</sup>

<sup>a</sup> *p* from Pearson's correlation coefficient

<sup>b</sup> *p* from two sample t-test

<sup>c</sup> *p* from ANOVA

<sup>d</sup> *p* from Spearman's rank correlation coefficient

## Appendix A: TRAQ Tool

Patient Name: \_\_\_\_\_ Date of Birth: \_\_\_/\_\_\_/\_\_\_ Today's Date \_\_\_/\_\_\_/\_\_\_ (MRN# \_\_\_\_\_)

### Transition Readiness Assessment Questionnaire (TRAQ)

**Directions to Youth and Young Adults:** Please check the box that best describes **your** skill level in the following areas that are important for transition to adult health care. There is no right or wrong answer and your answers will remain confidential and private.

**Directions to Caregivers/Parents:** If your youth or young adult is unable to complete the tasks below on their own, please check the box that best describes **your** skill level. **Check here** if you are a parent/caregiver completing this form.

	No, I do not know how	No, but I want to learn	No, but I am learning to do this	Yes, I have started doing this	Yes, I always do this when I need to
<b>Managing Medications</b>					
1. Do you fill a prescription if you need to?					
2. Do you know what to do if you are having a bad reaction to your medications?					
3. Do you take medications correctly and on your own?					
4. Do you reorder medications before they run out?					
<b>Appointment Keeping</b>					
5. Do you call the doctor's office to make an appointment?					
6. Do you follow-up on any referral for tests, check-ups or labs?					
7. Do you arrange for your ride to medical appointments?					
8. Do you call the doctor about unusual changes in your health (For example: Allergic reactions)?					
9. Do you apply for health insurance if you lose your current coverage?					
10. Do you know what your health insurance covers?					
11. Do you manage your money & budget household expenses (For example: use checking/debit card)?					
<b>Tracking Health Issues</b>					
12. Do you fill out the medical history form, including a list of your allergies?					
13. Do you keep a calendar or list of medical and other appointments?					
14. Do you make a list of questions before the doctor's visit?					
15. Do you get financial help with school or work?					
<b>Talking with Providers</b>					
16. Do you tell the doctor or nurse what you are feeling?					
17. Do you answer questions that are asked by the doctor, nurse, or clinic staff?					
<b>Managing Daily Activities</b>					
18. Do you help plan or prepare meals/food?					
19. Do you keep home/room clean or clean-up after meals?					
20. Do you use neighborhood stores and services (For example: Grocery stores and pharmacy stores)?					

