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Transition Readiness in Middle and Older Adolescents with Asthma and Associated Factors: A Descriptive Study

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Abstract

Objective: Asthma is the leading chronic health condition in adolescents, yet little is known about adolescents' readiness to transition into adult-focused care. This study examines transition readiness in middle and late adolescents with asthma.

Methods: This cross-sectional descriptive study was conducted in 2019 with 41 adolescents (16 to 20 years-old) with asthma. Transition readiness was measured with the 20-item Transition Readiness Assessment Questionnaire (TRAQ), which comprises 5 subscales.

Results: Slight majorities of the sample comprised females (58.5%) and minority adolescents (56%). The sample's overall mean score on the TRAQ was 3.89 (± 0.63 ; possible range 1-5). Managing daily activities was associated with talking with providers subscale ($r = 0.36$; $P < 0.01$), but not with other TRAQ subscales. Females reported greater scores for managing medications than did males, with mean=4.2 vs. 3.6 ($t = -2.15$, $P = 0.04$). Transition readiness did not differ by race or health insurance type. However, scores on arranging transportation to medical appointments were lower among minority adolescents than whites (4.17 vs. 4.8, $t = 2.56$, $P = 0.01$). Better asthma control was associated with higher scores on talking with providers ($r = -0.42$; $P < 0.01$), but not with other subscale domains.

Conclusions: Overall transition readiness is suboptimal in middle to late adolescents with asthma. Adolescents' capacity to manage daily activities is not a valid indicator of transition readiness in disease self-management. It is important to consider gender, race, and asthma control in understanding transition readiness in adolescents with asthma.

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Authorship Statement

Dr. Rhee contributed substantially to the acquisition, analysis, interpretation of data for the work, and drafting of the manuscript.

Ms. Choi contributed substantially to the analysis and interpretation of data, and critically revising the work for important intellectual content.

Dr. Tumiel-Berhalter contributed substantially to the acquisition of data and critically reviewing and revising the manuscript for important intellectual content.

All authors have provided final approval of the version of this manuscript to be submitted.

Declaration of Interest

All authors declare no conflict of interest to disclose.

Keywords

adolescents; asthma; transition readiness; self-management; gender difference; race difference; asthma control

INTRODUCTION

Adolescence encompasses the ages of 11 to 21 years, which can be divided into 3 stages: early (11-14 years), middle (15-17 years) and late (18-21 years) adolescents (1). For most middle and late adolescents, transitioning to adult-oriented healthcare is a looming issue, and the American Academy of Pediatrics (2) recommends the assessment of transition readiness in those aged 14-18 years. Routine assessments of transition readiness are advocated for as an approach to identify specific areas in which adolescents need assistance in building self-management skills and in navigating anticipated changes in healthcare when they become adults (3).

Having a chronic health condition complicates adolescents' developmental transition to independent young adulthood. Insisting on independence from parents may place adolescents' health at great risk if they are unprepared or uncommitted with respect to disease management. If their navigation of the complex transition to adult healthcare services is unsuccessful, they may also forgo their healthcare care routines (e.g., periodic asthma checkups). Thus, transitioning from pediatric healthcare to adult care in the presence of chronic conditions includes inherent risks (4, 5), yet adolescents with chronic conditions are inadequately prepared for this transition (6). Studies show that deterioration in the health of adolescents with chronic conditions is associated with transitioning (7-9). Lapses in treatment adherence, routine follow-up and/or insurance coverage that often occur during the transitional age are linked to a decline in health among young people with a chronic health condition such as asthma (8). An overall decline in annual preventive care visits and increased high-acuity emergency visits with associated costs have been reported after transfer from pediatric to adult care among young people with chronic health conditions including asthma (10). A thorough examination of transition readiness among adolescents is therefore critical.

Transition readiness has been assessed in adolescents with heart disease (11, 12), kidney disease (13), HIV (14), inflammatory bowel disease (15), and diabetes (16, 17). Transition readiness differs depending on the chronic condition (18), underscoring the necessity of examining transition readiness in each chronic condition separately. Although asthma is the most common chronic condition in adolescents, with significant increases in healthcare costs related to emergency visits post-transfer (10), the literature is limited regarding the transition readiness of adolescents with asthma into adult-oriented healthcare and their independent lives as young adults with asthma. A recent systematic review of 33 studies on transition readiness in adolescents with various chronic conditions (19) included no study that concerned asthma exclusively.

To provide adequate transition support and assistance for adolescents with asthma, we must first gauge the degree of individuals' readiness and associated factors for successful

transition. Therefore, the purpose of this study is to examine transition readiness in middle to late adolescents with asthma, using the widely adopted Transition Readiness Assessment Questionnaire (TRAQ), and to explore factors associated with their readiness. Given transition readiness being poorer among adolescents with a chronic condition compared to those without (18), we hypothesized that transition readiness in adolescents with asthma would be suboptimal. We also hypothesized that transition readiness would differ by sociodemographic factors including gender, age, race, and health insurance type. No studies examined the relationships between transition readiness and asthma control. However, based on studies demonstrating transition readiness associated with the degrees of disease control in adolescents with a chronic condition (20, 21), we hypothesized that transition readiness would be associated with asthma control.

MATERIALS AND METHODS

Study Sample and Setting

This descriptive cross-sectional study is based on questionnaire data collected as part of qualitative research conducted in 2019 in the Western New York metropolitan area to explore the experience of adolescents with asthma as they transition into young adulthood and adult-focused care. Fifty percent of the participants were recruited from a contact database of adolescents who completed another asthma study one to two years prior. Those in the contact database who were within the age criteria of the current study were contacted by phone or via mail introducing the study. Any interested adolescents and parents (if teens under 18) were screened over the phone and enrolled upon confirming eligibility. Others were recruited from community centers (e.g., YMCA) and local colleges (27.5%) through study flyers. Direct contacts were attempted at a local college cafeteria particularly for recruiting older participants (18-20 years-old). The remainders were recruited through referrals by friends or family members (15%) or providers (7.5%) in local practices. Eligibility criteria were as follows: age 16–20 years; diagnosis of asthma at least 1 year prior to screening; being on controller/preventive medication; and English proficiency. Those with other chronic health conditions (e.g., diabetes, cystic fibrosis) requiring daily medication were excluded, because such conditions could complicate adolescents' transition to adult healthcare.

Human Subject Protection

The study protocol was reviewed and approved by the institutional review board in each of the two academic institutions where the study originated (University of Rochester, University at Buffalo), and data were collected at the University at Buffalo. Prior to data collection, written informed assent and consent were obtained from participants aged 16–17 years and their parents, respectively; participants aged 18 years or more provided consent themselves.

Data Collection and Measures

Adolescents completed the questionnaire data in the project office or by telephone with a research assistant. Parents provided sociodemographic and asthma information (e.g., age at

diagnosis and medication) for 16–17-year-olds, whereas those who are 18 or older provided the data for themselves. Questions about smoking status were completed by adolescents.

Transition Readiness—The TRAQ comprises 20-items measured on a 5-point scale ranging from 1 (“No, I do not know how”) to 5 (“Yes, I always do this when I need to”) (22). The scale comprises five subscales: Managing Medications (4 items), Appointment Keeping (7 items), Tracking Health Issues (4 items), Talking with Providers (2 items), and Managing Daily Activities (3 items). Mean scores are calculated for the entire scale and for each of the 5 subscales with higher scores indicating higher transition readiness. The scale’s validity is established, and reliability was acceptable ($\alpha = 0.85$) for the present sample. A mean score 4 (“I’ve started doing this”) on the TRAQ (overall, subscales, or individual items) was used as a cut-off for being “ready.”

Asthma Control—The Asthma Control Questionnaire (ACQ) has 6 items measured on a 5-point scale. Each item captures youths’ activity, daytime/nighttime symptoms, and rescue medication use in the past week (23) (e.g., “On average, during the past week, how often were you woken by your asthma during the night”). Mean scores are computed, with higher scores indicating poorly controlled asthma. The proximity of reference time frame to recall in the ACQ compared to other measures (i.e., past week vs. past 4 weeks) makes it an ideal tool to minimize recollection bias. The ACQ’s strong associations with quality of life including symptom, activity and emotional subdomains in adolescents with asthma (24) further support it as a valid measure of asthma control in this sample. The reliability of the measure was acceptable with $\alpha = 0.81$ in the present study. Cut-off points for controlled asthma and not-well-controlled asthma have been set at 0.75 and 1.5, respectively.

Sociodemographic Data—Age, gender at birth, race, household income and health insurance type, age at asthma diagnosis, and smoking status were obtained at enrollment. For smoking status determination, a question “have you ever smoked?” was asked with dichotomized responses (Yes vs. No). The affirmative response was followed by “how frequently?” for which two response options were given, “once/experimentally” and “frequently/habitually.”

Data Analysis

Descriptive statistics for the sample’s characteristics included means (with standard deviations) and frequencies. Pearson correlations were computed to examine the relationships between the 5 subscales of TRAQ and asthma control. *t*-tests were conducted to examine differences in transition readiness scores by age (16–17 years vs. 18–20 years), gender (male vs. female), race (white vs. minority), and health insurance status (public vs. private). In the United States, a person under the age of 18 is legally considered ‘minor.’ The age breakdowns were to compare those minors with non-minors, yet still adolescents developmentally. Due to the strong association between insurance type and family income ($P < 0.001$), no separate analysis was conducted for family income. In addition, we conducted nonparametric Mann-Whitney *U* tests given the small sample size to test for group differences in transition readiness. Multiple regression analyses were performed to

examine the unique contribution of each of the sociodemographic factors and asthma control to transition readiness.

RESULTS

Sample Characteristics

Table 1 summarizes the demographic characteristics of the sample. Of 41 participants, 21 (51%) were late adolescents (18–20 years old) and 24 were females (58.5%). Minority adolescents constituted 56% of the sample ($n = 23$), and about 49% of the sample ($n = 20$) had public health insurance. Well-controlled asthma was reported in 49% of the sample ($n = 20$), and 24% ($n = 10$) were not well-controlled. Of 8 participants (20%) with a history of smoking, 4 reported frequent or habitual smoking. Because 2 teens did not complete the TRAQ for unknown reason, the analyses reported in the study were based on 39 participants.

Transition Readiness Overall Scale and 5 Subscales

The overall mean score on the TRAQ was 3.89 (± 0.63). Among the subscales, only the talking with providers and managing daily activities subscales had mean scores > 4 (Table 1). Table 2 provides the mean scores for each of the 20 items along with the percentages of affirmative responses (“yes, I’ve started doing this,” and “yes, I always do this”) indicating readiness for each item. Mean scores for half of these items were below 4; of these, 3 items about making questions before doctor’s visit, applying for health insurance, knowing insurance coverage had a mean score below 3. Only 30.8% reported to have prepared questions before a clinical appointment, whereas 23.7% and 42.6% of the sample responded to have applied for health insurance or known their insurance coverage, respectively.

Table 3 provides correlations among the TRAQ subscale domains. Managing medications was significantly associated with appointment keeping ($r = 0.67$, $P < 0.001$) and tracking health issues ($r = 0.62$, $P < 0.001$). Appointment keeping was associated with both talking with providers ($r = 0.35$, $P = 0.03$) and tracking health issues ($r = 0.57$, $P < 0.001$), whereas managing daily activities was associated only with talking with providers ($r = 0.36$, $P = 0.02$).

Factors Associated with Transition Readiness

Gender (see Supplementary Table 1)—Females reported higher scores on the managing medications subscale than did males, with a mean score of 4.2 versus 3.6. Specifically, females had significantly higher mean scores than did males for knowing how to manage a bad reaction to medications (4.05 vs. 2.88) and reordering medications before they ran out (4.18 vs. 3.24). Both genders scored high on the managing daily activities subscale, although females’ scores were slightly yet significantly higher (4.8 vs. 4.5).

Age (see Supplementary Table 2)—The transition readiness scores of older participants (18–20 years) were higher than those of the younger counterparts on the overall scale (4.12 vs. 3.62) and on the appointment keeping subscale (3.88 vs. 3.04). Older participants had significantly higher mean scores on 5 items than did younger participants on t-tests. The nonparametric tests revealed two additional items (*filling prescription* and

sharing feelings with providers), for which the older group had significantly higher mean ranks.

Race (see Supplementary Table 3)—No differences were found between white and minority adolescents in mean readiness overall and on the 5 subscales. With respect to individual items, minority adolescents scored higher on knowing how to manage bad reactions to medications than did their white counterparts (3.96 vs. 2.87), whereas white adolescents had higher scores on arranging rides to medical appointments than did their minority counterparts (4.8 vs. 4.17).

Health insurance (see Supplementary Table 4)—Mean readiness scores either overall or on the 5 subscales did not differ by type of health insurance. However, on individual items, those with public insurance scored significantly lower on arranging transportation to medical appointments than did those with private insurance (4.05 vs. 4.73). The nonparametric *U*-test showed similar group difference for the item, although failed to reach significance ($p=.06$). Conversely, those with public insurance had higher scores on applying for health insurance than did those with private insurance (2.79 vs. 1.53). Only 7 out of 21 older adolescents responded that they had applied for health insurance when they lost coverage. Of the seven participants, all but one had public insurance.

Asthma control (see Supplementary Table 5)—No associations were found between asthma control and transition readiness either overall or on the subscales, except on the talking with providers subscale, for which a negative association was found ($r = -0.42$; $P < 0.01$); that is, the better the asthma control, the greater the score for the subscale. Specifically, answering to questions by providers was found to be associated with greater asthma control ($r = -.35$; $P = 0.03$).

Age at asthma diagnosis and smoking status were not associated with transition readiness overall or on any of the subscales.

Multivariate Analyses—Because gender, age, and asthma control were associated with at least one of readiness subscale domains, multiple regression models were conducted to estimate the unique contribution of each factor in predicting transition readiness. Table 4 summarizes results of the regressions models predicting overall TRAQ and five subscales. Age significantly predicted transition readiness overall, appointment keeping, and tracking health issues after adjusting for other covariates. Older age was associated with greater transition readiness overall and these subdomains. Managing medication was significantly predicted by gender with females being better prepared on the subdomain. Better asthma control was associated with the higher scores on talking with providers after controlling for other covariates.

DISCUSSION

This study examined transition readiness in middle to late adolescents with asthma, using the TRAQ. Overall transition readiness appeared to be suboptimal for those who were either at the cusp of or in the process of transitioning to adult-focused healthcare. Their

readiness to manage their medications and clinical appointments and to track health issues was particularly limited. Notably, adolescents' readiness to manage daily activities was not correlated with their readiness to manage their asthma, which included managing medications, managing clinical appointments, or tracking health issues. This suggests that adolescents' performing daily routines or chores independently may not always translate into their readiness to take on the responsibilities of managing their health. Although late adolescents seemed better in appointment keeping than did middle adolescents, their readiness to manage medications and track health issues was still suboptimal, just as it was among their younger counterparts. Adolescents' poor self-management skills including poor medication adherence are a common issue for transitioning adolescents with various chronic conditions (25–27) including asthma (28). Therefore, to use the keeping of appointments as a single indicator of successful transition (29) can paint only an incomplete picture of adolescents' transition readiness; one must also consider self-management practices and skills.

The talking with providers subscale score in the present study (4.67) was slightly higher than the score reported in another study of asthma with younger adolescents ages 12–16 years (30). Interestingly, we found no associations between talking with providers and medication management. Similarly, in Jones et al.'s study (30), “ready” adolescents who talked with providers “always” were no more responsible for asthma self-care or adherent to controller medication than were those who were less ready. Given that patient-provider communication often plays an important role in medication adherence (31), the lack of association is surprising. Perhaps, it is due to the type of communication captured by the subscale. In the present study, over 90% reported sharing their feelings with providers and answering any questions asked by providers (thus the high scores on the talking with providers subscale), whereas only 30% engaged in a proactive form of communication by making a list of questions for their clinical appointments. Therefore, the lack of associations between high communication scores and medication management may have been due in part to the nature of the communication captured by the subscale, which was more affective and passive.

Nonetheless, we found that greater transition readiness particularly in talking with providers was associated with better asthma control regardless of age or gender, contradicting an earlier study (30) that reported no relationship between talking with providers scores and asthma control. These inconsistent findings may be due in part to differences in age; our participants were older (16–20 years) than those in the earlier study (12–16 years). Thus patient-provider communications may have more serious implications for asthma control in older than in younger adolescents. The association between talking with providers and asthma control found in the present study can be explained in two ways. First, adolescents with better controlled asthma may feel more confident or competent in sharing information with their providers. Alternatively, better communication with providers may help providers tailor treatment plans, leading to better controlled asthma.

Females appear to be more transition ready than males. Whereas one earlier study (32) of adolescents aged 16–22 years with asthma reported no gender difference in medication use, we found females' greater readiness to manage medication than males' regardless of age and asthma control. Similar gender differences in transition readiness have been reported in

studies of other chronic conditions (33, 34). Females' superior preparedness in medication use may be due to their greater adaptability to incorporate asthma treatment into their social and personal identity (35), whereas males' emotions or attitudes in relation to asthma tend to be more negative than those of females (32). Because medication adherence has implications for quality of life in older adolescents with asthma (32), males' low readiness for medication readiness raises a concern, calling for intervention.

Only one third of late adolescents responded that they had applied for health insurance when they lost current coverage. To be eligible for the Children's Health Insurance Program, one must be under the age of 19 years, so late adolescents who do not apply for health insurance are either at risk of losing coverage or have already lost coverage. Although participants' scores on applying for insurance were higher among those with public insurance than among those with private insurance, our data suggest that this task of transition is not consistently carried out by most adolescents. Indeed, a systematic review (36) has identified insurance issues such as "aging out" of public insurance plans and obtaining affordable plans as common barriers to the transition. Lack of health insurance in adolescents aged 18 or older was associated with substantially higher rates of delays in seeking care and failure to receive medical care or prescription medications to treat asthma (31, 37). Because insurance issues in late adolescents pose a serious threat to the continuity of asthma care particularly in underserved populations, paying close attention to anticipated changes in insurance status and providing appropriate assistance in securing insurance coverage is an important consideration for providing transitional care.

As in one earlier study of other chronic conditions (18), in the present study we found no racial differences in overall transition readiness and on the 5 subscales. This finding, however, does not agree with one earlier study of younger adolescents (30), in which white adolescents were found to have higher readiness than minority adolescents. In examining individual items, however, we found that minority adolescents rated higher on knowing how to manage bad medication reactions than did their white counterparts. It is unclear whether minority adolescents had more adverse effects of asthma medication, making them more knowledgeable in dealing with medication reactions than white adolescents. It is also noteworthy that minority adolescents were less ready to arrange transportation to clinical appointments than were white counterparts. Issues in transportation as a social determinant of health are a recognized factor that hampers healthcare access in underserved minority populations (38, 39). Thus, our study highlights social determinants of health such as transportation and health insurance as important for understanding and addressing transition readiness in minority adolescents with asthma.

The present study has the following limitations. First, given its cross-sectional nature, causal inferences between transition readiness and associated factors are not warranted. Second, we used a small convenience sample of middle to late adolescents, contributing to selection bias and limited generalizability, so applying the present findings to general adolescent populations requires caution. Particularly, generalizing to early adolescents is not warranted. Third, response bias in reporting transition readiness cannot be ruled out, given the nature of self-reports; social desirability might have influenced some positive responses. In addition, we had over 10% of missing data on health insurance, which

may have affected the precision of the estimations of group differences. Nonparametric tests performed additionally, nonetheless, corroborated the findings of group comparisons. Lastly, conducting multiple analyses might have increased the chance of Type I error. Given the study's exploratory nature, the findings should be construed as heuristic, rather than conclusive. To address the aforementioned limitations, this study's findings need to be replicated in a larger study with a more meticulously designed sample and robust analysis.

CONCLUSIONS

As hypothesized, overall transition readiness is suboptimal in middle to late adolescents with asthma. The hypotheses regarding factors associated with transition readiness are also supported, albeit partially, given that not all factors under consideration were similarly associated with overall or specific dimensions of transition readiness. This is the first attempt to examine all 5 TRAQ subdimensions of transition readiness in middle to late adolescents with asthma. As demonstrated, transition readiness is a multidimensional phenomenon, with dimensions that do not always progress synchronously. For example, reaching independence in managing daily activities does not always translate into readiness in other domains of readiness that are more specific to disease self-management. It is therefore critical to pay specific attention to each dimension, in order to inform targeted readiness support or interventions, particularly for adolescents of male gender or with poorly controlled asthma. It is also noteworthy that minority and publicly insured adolescents were as ready as their white counterparts for transition, except in one respect—less access to healthcare due to transportation challenges, suggesting the impact of social determinants of health on transition readiness. Simply targeting individual adolescents may not suffice to address deficiencies in transition readiness. There must be careful assessment of societal readiness that ensures healthcare access, in order to facilitate the successful transition of minority and economically disadvantaged adolescents with asthma into adult-focused care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Additional Information

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Table 1.

Characteristics of the sample and study variables

Characteristics/Variables	M (Std)	N	%
Age (years)	17.68 (1.21)		
Middle adolescents (16-17)		20	48.8
Late adolescents (18-20)		21	51.2
Sex at birth			
Male		17	41.5
Female		24	58.5
Race			
White		16	39.0
Minority ^a		23	56.1
Missing		2	4.9
Health insurance			
Private		16	39.0
Public		20	48.8
Missing		5	12.2
Lifetime smoking			
Yes ^b		8	19.5
No		27	65.9
Missing		6	14.6
Age of diagnosis			
6 years old		22	53.6
> 6 years old		17	41.5
Missing		2	4.9
Household income (annual)			
<\$30,000		18	43.9
\$30,000		17	41.5
Missing		6	14.6
ACQ ^c			
Overall	1.03 (0.89)		
Well controlled ^e		20	48.8
Somewhat controlled		9	22.0
Not well controlled ^f		10	24.4
Missing		2	4.9
TRAQ ^d			
Overall	3.89 (0.63)		

Characteristics/Variables	M (Std)	N	%
Managing medication	3.97 (0.86)		
Appointment keeping	3.49 (0.94)		
Talking with providers	4.67 (0.60)		
Managing daily activities	4.66 (0.47)		
Tracking health issues	3.54 (0.84)		

^ablack n=19 (46.3%), Hispanic n=1 (2.4%), bi/multi-racial n=3 (7.3%);

^bfrequently/habitual n=4 (50.0%), once/experimentally n=3 (37.5%), missing n=1 (12.5%);

^cAsthma Control Questionnaire;

^eACQ < 0.75;

^fACQ 1.25;

^dTransition Readiness Assessment Questionnaire

Table 2.Descriptive statistics for individual TRAQ^a items (n=39)

Items	Mean (Std)	No of “yes” ^b (%)
1. Do you fill a prescription if you need to?	3.82 (1.43)	28 (71.8%)
2. Do you know what to do if you are having a bad reaction to your medications?	3.54 (1.67)	23 (59.0%)
3. Do you take medications correctly and on your own?	4.82 (0.46)	37 (97.4%)
4. Do you reorder medications before they run out?	3.77 (1.23)	23 (59.0%)
5. Do you call the doctor’s office to make an appointment?	3.87 (1.20)	25 (64.1%)
6. Do you follow-up on any referral for tests or check-ups or labs?	3.59 (1.53)	23 (59.0%)
7. Do you arrange for your ride to medical appointments?	4.41 (0.94)	34 (87.2%)
8. Do you call the doctor about unusual changes in your health?	3.54 (1.52)	23 (59.0%)
9. Do you fill out the medical history form, including a list of your allergies?	4.11 (1.31)	30 (78.9%)
10. Do you keep a calendar or list of medical and other appointments?	4.05 (1.34)	30 (76.9%)
11. Do you tell the doctor or nurse what you are feeling?	4.59 (0.97)	36 (92.3%)
12. Do you answer questions that are asked by the clinic staff?	4.74 (0.64)	37 (94.9%)
13. Do you make a list of questions before the doctor’s visit?	2.62 (1.58)	12 (30.8%)
14. Do you apply for health insurance if you lose your current coverage?	2.13 (1.46)	9 (23.7%)
15. Do you know what your health insurance covers?	2.97 (1.51)	17 (43.6%)
16. Do you get financial help with school or work?	3.38 (1.62)	21 (53.8%)
17. Do you manage your money & budget household expenses?	3.90 (1.39)	28 (71.8%)
18. Do you help plan or prepare meals/food?	4.28 (1.08)	33 (84.6%)
19. Do you keep home/room clean or clean-up after meals?	4.85 (0.37)	39 (100.0%)
20. Do you use neighborhood stores and services?	4.85 (0.43)	38 (97.4%)

^aTransition Readiness Assessment Questionnaire;^b“yes” includes answers “yes, I’ve started doing this (4)” and “yes, I always do this (5).”

Table 3.Correlations between TRAQ^a and 5 subscales (n=39)

Variable	M	Std	1	2	3	4	5	6
1. TRAQ mean score	3.89	0.63	—					
2. TRAQ: MM ^b	3.97	0.86	0.83 **	—				
3. TRAQ: AK ^c	3.50	0.94	0.92 **	0.67 **	—			
4. TRAQ: TWP ^d	4.67	0.60	0.47 **	0.22	0.35 *	—		
5. TRAQ: MDA ^e	4.66	0.47	0.36 *	0.21	0.23	0.36 *	—	
6. TRAQ: THI ^f	3.54	0.84	0.78 **	0.62 **	0.57 **	0.30	0.11	—

* p < 0.05;

** p < 0.01;

^aTransition Readiness Assessment Questionnaire;^bManaging Medication;^cAppointment Keeping;^dTalking With Providers;^eManaging Daily Activities;^fTracking Health Issues

Table 4.

Results of multiple regression analyses predicting TRAQ overall and 5 subscales

	B	95%CI	β	t	P
TRAQ Overall					
Gender (female = 0)	-0.27	-0.66, 0.12	-0.22	-1.43	0.16
Age	0.22	0.06, 0.37	0.43	2.86	0.007 **
Asthma control	-0.03	-0.25, 0.19	-0.05	-0.30	0.77
Managing Medication					
Gender (female = 0)	-0.58	-1.14, -0.02	0.04	-2.12	0.04 *
Age	0.16	-0.06, 0.8	0.23	1.47	0.156
Asthma control	-0.10	-0.42, 0.22	-0.10	-0.64	0.52
Appointment Keeping					
Gender (female = 0)	-0.10	-0.67, 0.49	-0.05	-0.32	0.75
Age	0.37	0.14, 0.60	0.49	3.28	0.002 **
Asthma control	0.03	-0.30, 0.36	0.03	0.20	0.84
Talking with Providers					
Gender (female = 0)	0.07	-0.31, 0.46	0.06	0.38	0.71
Age	0.08	-0.08, 0.23	0.17	1.02	0.32
Asthma control	-0.26	-0.48, -0.04	-0.38	-2.38	0.02 *
Managing Daily Activities					
Gender (female = 0)	-0.30	-0.62, 0.02	-0.32	-1.91	0.06
Age	-0.02	-0.15, 0.10	-0.06	-0.38	0.71
Asthma control	0.01	-0.17, 0.19	0.02	0.11	0.91
Tracking Health Issues					
Gender (female = 0)	-0.43	-0.96, 0.10	-0.26	-1.64	0.11
Age	0.25	0.04, 0.46	0.37	2.46	0.02 *
Asthma control	-0.01	-0.31, 0.29	-0.01	-0.08	0.93

* p < 0.05;

** p < 0.01