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Motivation to Quit Smoking among Parents of Urban Children with Asthma

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Abstract

Objective—To identify factors associated with motivation to quit smoking among parents of urban children with asthma.

Methods—We analyzed data from parents who smoke and had a child enrolled in the School-Based Asthma Therapy trial. We assessed asthma symptoms, children's cotinine, and parent smoking behaviors. Motivation to quit smoking was assessed by a 10-point continuous measure (1=not at all motivated; 10=very motivated).

Results—209 parents smoked (39% of sample), and children's mean cotinine was 2.48 ng/ml. Motivation to quit was on average 6.9, and 47% of parents scored ≥ 8 on the scale. Parents who believed their child's asthma was *not* under good control, and parents who strongly agreed their child's asthma symptoms would decrease if they stopped smoking had higher motivation to quit compared to their counterparts ($p < .05$). In a multivariate analysis, parents who believed their child's asthma was not under control had more than twice the odds of reporting high motivation to quit.

Conclusion—Parents' perception of the risks of smoking to their child with asthma is associated with motivation to quit.

Practice Implications—Raising awareness about the effect of smoking and quitting on children's asthma might increase motivation to quit among parents.

Keywords

Asthma; parents; children; smoking cessation; motivation; environmental tobacco smoke

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1. Introduction

Asthma is one of the most common chronic conditions of childhood,[1,2] and is responsible for substantial morbidity, particularly among urban children.[3-7] Environmental tobacco smoke (ETS) is strongly associated with increased morbidity among children with asthma, [8-12] including higher requirements for medications, greater symptom severity and more frequent emergency department visits.[13,14] Unfortunately, as many as 50% of urban children with asthma live with at least one smoker.[15,16]

Motivation to quit is a key factor in determining success in quitting smoking. Motivation predicts participation in smoking cessation treatment, attempts to quit[17,18] and successful smoking cessation.[18] We sought to examine factors related to motivation to quit among parents of urban children with persistent asthma.

2. Methods

2.1. Participants

We collected data from parents of children participating in the School-Based Asthma Therapy (SBAT) trial, a study involving the promotion of medication adherence among 3-10 year old urban children with persistent asthma in Rochester NY (response rate:74%[19]). For the purpose of this study, only baseline data are used. The study was approved by the Institutional Review Board at the University of Rochester Medical School.

For this analysis, we included only children with primary caregivers (hereafter referred to as parents) who were smokers (N=210). Eligible children had physician-diagnosed asthma and persistent symptoms[20,21]. We excluded one child whose parent provided inconsistent responses about whether or not they smoked. Our final sample included 209 parents who smoke.

2.2. Measurements

2.2.1. Motivation to quit—Parent motivation to quit was assessed with a 10-point item (1= not at all motivated to quit/10=very motivated).[22,23] We used this measure as a continuous variable, and also dichotomized responses at <8 vs.≥8 to identify parents with motivation levels below and above the 50th percentile for the group.

2.2.2. Smoking history and beliefs about smoking—We asked parents how many cigarettes they smoke in a typical 7-day period, the number of smokers living in the child's home, whether the parent planned to quit in the next 30 days (yes/no), and previous quit attempts (yes/no). We also asked whether, in the past month, they had reduced the number of cigarettes smoked (yes/no). We asked parents where they smoked (outside only/inside and outside/mostly inside), and to rate their agreement (Strongly Agree/Agree/Disagree/Strongly Disagree) with the following statement: “if you or other household members stop smoking, it would decrease your child's asthma symptoms”. Lastly, we collected salivary cotinine samples from each child.[24,25]

2.2.3 Asthma symptoms and perception of asthma control—Parents reported the number of days in the previous 14 days their child had daytime and nighttime asthma symptoms. Children with ≥ 5 days or ≥ 2 nights with symptoms over two weeks were considered to have persistent asthma.[20] We assessed parent perception of their child's asthma control by asking how much they agree (Strongly Agree/Agree/Disagree/Strongly Disagree) with the following statement: “My child's asthma is under good control”.[26]

2.2.4 Covariates—Covariates consisted of standard demographic variables including the child's age, gender, and insurance (Medicaid/no Medicaid). Parent information included age (<30years/≥30years), education (<high school/high school), depression[27,28], and stress[29].

2.3. Data analysis

We performed analyses using SPSS version 15.0 (Statistical Product and Service Solutions 15.0; SPSS Inc, Chicago, Ill). The cotinine scores were log transformed prior to analysis. We used independent student t-tests and multivariate regression analyses to identify factors associated with motivation to quit smoking.

3. Results

The average motivation to quit was 6.9 (SD 2.7), and 47% of parents reported high motivation to quit (≥8). Table 1 shows the demographic characteristics of these parents and their children. Parents smoked on average 8.6 cigarettes/day and 34% reported smoking only outside the home (Table 2). Half of the parents (51%) had reduced the number of cigarettes they smoked in the previous month and the majority (84%) had at least one prior quit attempt. Only 15% of parents planned to quit in the next 30 days. The children's mean salivary cotinine was 2.48ng/ml (range 0-25ng/ml), representing moderate amounts of smoke exposure.

Parents with prior quit attempts had higher motivation to quit smoking (M=7.08, SD=2.59) than parents who had never attempted quitting (M=5.68, SD=2.78; p=.005). Importantly, while the child's actual symptom severity was not associated with motivation to quit, parents who believed that their child's asthma was *not* under good control had higher motivation (M=7.64, SD2.60) compared to parents who perceived their child's asthma to be under good control (M=6.65, SD2.66; p=.03)(Table 3). Similarly, parents who strongly agreed that their child's asthma symptoms would decrease if they stopped smoking had higher motivation (M=7.46, SD2.24) compared to parents who did not strongly agree (M=6.53, SD2.82; p=.02). In a multivariate logistic regression controlling for factors significant in the bivariate analysis (p<.05), parents who believed that their child's asthma was *not* under control had 2 times greater odds of reporting high motivation to quit smoking compared to parents who believed that their child's asthma was well controlled (OR 2.8; 95% CI 1.27, 5.95).

4. Discussion and conclusion

4.1. Discussion

We found that many parents who smoke and have a child with asthma are motivated to quit. In fact, almost ½ of parents reported motivation to quit as greater than “8” on a 10-point scale. Unfortunately, only 1/3 of parents reported smoking only outside, and children's cotinine measurements revealed, on average, moderate tobacco smoke exposure. This underscores room for significant improvement in reducing ETS exposure among children with asthma.

Motivation to quit is a key factor in determining success in quitting smoking, with high motivation increasing the likelihood of success with attempting and maintaining smoking cessation.[30] The role of motivation in smoking cessation is highlighted by the continually emerging field of motivational interviewing. Motivational interviewing (MI) is a patient-centered counseling technique that enhances an individual's intrinsic motivation for change. [31] MI has been successfully used as a strategy for smoking cessation for parents of children with asthma[32,33] and has been recommended to help reduce household ETS.

[32,34] Given that new and effective treatments are emphasizing building motivation as an integral treatment component, it is pertinent to understand the correlates of motivation in populations of parents of children with asthma.

Individuals who smoke, in general, have higher motivation to quit if they are concerned about the health consequences of their smoking.[35] One study found that parents of children with smoking-related illnesses have higher motivation to quit compared to the general smoking population.[36] We found that parent's perception that their child's asthma was poorly controlled (but not the child's actual symptom severity) was associated with higher motivation to quit smoking. This relates to the parent's perceived vulnerability to risk, [37] suggesting that parents may be more motivated to quit when they connect smoking to poorly controlled symptoms in their child. This is pertinent because parents often underestimate their child's asthma severity, and mistakenly perceive their child's asthma to be under good control, even when they are experiencing frequent symptoms.[26] In the general population of smokers, data suggest that increasing an individual's belief that smoking will cause health problems can increase their motivation to quit.[38,39]

Additionally, we found that parents who strongly agreed their child's symptoms would decrease if they quit smoking had higher motivation to quit compared to parents who did not strongly agree their child's symptoms would decrease. This relates to the construct of perceived precaution effectiveness, or outcome expectancy,[40] which is the notion that if someone does the precautionary behavior (i.e., quit smoking), the desired benefits will ensue (i.e., the child's asthma will improve). Persons are most likely to be successful at changing a given behavior when they are not only self-efficacious, but also convinced that their changes will result in beneficial outcomes. Our study considers the influence of this construct among parents of children with asthma relating to outcomes in their child. Importantly, data suggest that increasing an individual's expectancies regarding the effects of an intervention can improve their response to the therapy.[41,42]

Previous studies support that motivation to quit can be augmented among parents who have a child with asthma through feedback that targets perception of risk and outcome expectations.[33,43] In addition, parents of children with asthma are frequently counseled to establish clear home smoking rules to protect their child from exposure. It is possible that additional work with families with a child with asthma to help link the impact of ETS on the child's health, and enhance the parent's understanding of the benefits of eliminating smoke exposure on the child's health could help to move parents forward in their change behavior to quit smoking and/or implement home smoking bans.

4.2. Practice Implications

Practitioners should provide smoking cessation counseling to all parents who smoke and have a child with asthma. Parents who perceive their child's asthma to be under good control may not view quitting as important, because they are less likely to connect their smoking behavior with their child's asthma. These smokers may need multiple messages about the dangers of smoking and the potential benefits of reducing smoking on their own and their child's health. In addition, providing education for parents to foster a realistic perception of their child's asthma control could potentially enhance motivation to quit.

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References

1. Akinbami LJ. The state of childhood asthma, United States, 1980-2005. *Adv Data* 2006;381:1-24. [PubMed: 17180851]
2. Akinbami LJ, Schoendorf KC. Trends in childhood asthma: prevalence, health care utilization, and mortality. *Pediatrics* 2002;110:315-22. [PubMed: 12165584]
3. Carr W, Zeitel L, Weiss K. Variations in asthma hospitalizations and deaths in New York City. *Am J Public Health* 1992;82:59-65. [PubMed: 1536336]
4. Lang DM, Polansky M. Patterns of asthma mortality in Philadelphia from 1969 to 1991. *N Engl J Med* 1994;331:1542-6. [PubMed: 7969323]
5. Weiss KB, Wagener DK. Changing patterns of asthma mortality. Identifying target populations at high risk. *J Amer Med Assoc* 1990;264:1683-7.
6. Weiss KB, Sullivan SD, Lyttle CS. Trends in the cost of illness for asthma in the United States, 1985-1994. *J Allergy Clin Immunol* 2000;106:493-9. [PubMed: 10984369]
7. Gupta RS, Carrion-Carire V, Weiss KB. The widening black/white gap in asthma hospitalizations and mortality. *J of Allergy Clin Immunol* 2006;117:351-358. [PubMed: 16461136]
8. Weiss ST, Tager IB, Speizer FE, Rosner B. Persistent wheeze. Its relation to respiratory illness, cigarette smoking, and level of pulmonary function in a population sample of children. *Am Rev Respir Dis* 1980;122:697-707. [PubMed: 7447154]
9. Chilmonczyk BA, Salmun LM, Megathlin KN, Neveux LM, Palomaki GE, Knight GJ. Association between exposure to environmental tobacco smoke and exacerbations of asthma in children. *N Engl J Med* 1993;328:1665-9. [PubMed: 8487825]
10. Oddoze C, Dubus JC, Badier M, Thirion X, Pauli AM, Pastor J. Urinary cotinine and exposure to parental smoking in a population of children with asthma. *Clin Chem* 1999;45:505-9. [PubMed: 10102910]
11. Abulhosn RS, Morray BH, Llewellyn CE, Redding GJ. Passive smoke exposure impairs recovery after hospitalization for acute asthma. *Arch Pediatr Adolesc Med* 1997;151:135-9. [PubMed: 9041867]
12. Mannino DM, Homa DM, Redd SC. Involuntary smoking and asthma severity in children: data from the Third National Health and Nutrition Examination Survey. *Chest* 2002;122:409-15. [PubMed: 12171810]
13. Institute of Medicine. *Clearing the Air: Asthma and Indoor Air Exposures*. Washington, DC: National Academy Press; 2000.
14. Morkjaroenpong V, Rand CS, Butz AM, Huss K, Eggleston P, Malveaux FJ. Environmental tobacco smoke exposure and nocturnal symptoms among inner-city children with asthma. *J Allergy Clin Immunol* 2002;110:147-53. [PubMed: 12110834]
15. Kattan M, Mitchel H, Eggleston P, Gergen P, Crain E, Redline S, Weiss K, Evand R III, Kaslow R, Keresmar C, Leickly F, Malveaux F, Wedner HJ. Characteristics of inner-city children with asthma: the National Cooperative Inner-City Asthma Study. *Pediatr Pulmonol* 1997;24:253-262. [PubMed: 9368259]
16. Halterman JS, Fagnano M, Conn KM, Szilagy PG. Do parents of urban children with persistent asthma ban smoking in their homes and cars? *Ambul Pediatr* 2006;115-119. [PubMed: 16530150]
17. Biener L, Abrams DB. The Contemplation Ladder: Validation of a measure of readiness to consider smoking cessation. *Health Psychology* 1991;10:360-365. [PubMed: 1935872]
18. DiClemente CC, Prochaska JO, Fairhurst SK, Velicer WF, Velasquez MM, Rossi JS. The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology* 1991;59:295-304. [PubMed: 2030191]
19. Halterman JS, Borrelli B, Fisher S, Szilagy P, Yoos L. Improving Care for Urban Children with Asthma: Design and Methods of the School-Based Asthma Therapy Trial. *Journal of Asthma* 2008;45:279-286. [PubMed: 18446591]
20. National Institutes of Health. *Guidelines for the Diagnosis and Management of Asthma. Expert Panel Report 2*. NIH Publication 97-4051. Bethesda, Maryland: National Institutes of Health, National Heart, Lung and Blood Institute; 1997.

21. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. Bethesda, Maryland: National Institutes of Health; 2007.
22. Rollnick S, Butler CC, Stott N. Helping smokers make decisions: the enhancement of brief intervention for general medical practice. *Patient Educ Couns* 1997;31:191–203. [PubMed: 9277242]
23. Resnicow K, DiIorio C, Soet JE, Ernst D, Borrelli B, Hecht J. Motivational Interviewing in Health Promotion: It Sounds Like Something is Changing. *Health Psychol* 2002;21:444–451. [PubMed: 12211511]
24. Irvine L, Crombie IK, Clark RA, Slane PW, Goodman KE, Feyerabend C. What determines levels of passive smoking in children with asthma? *Thorax* 1997;52:766–9. [PubMed: 9371205]
25. Willers S, Axmon A, Feyerabend C, Nielsen J, Skarping G, Skerfving S. Assessment of environmental tobacco smoke exposure in children with asthmatic symptoms by questionnaire and cotinine concentrations in plasma, saliva, and urine. *J Clin Epidemiol* 2000;53:715–21. [PubMed: 10941949]
26. Halterman JS, McConnochie KM, Conn KM, Yoos HL, Kaczorowski JM, Holzhauer RJ. A potential pitfall in provider assessments of the quality of asthma control. *Ambul Pediatr* 2003;3:102–5. [PubMed: 12643784]
27. Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E. Screening for serious mental illness in the general population. *Arch Gen Psychiatry* 2003;60:184–9. [PubMed: 12578436]
28. Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale (K10). *Aust N Z J Public Health* 2001;25:494–7. [PubMed: 11824981]
29. Abidin, RR. Parenting Stress Index. 3rd. Odessa, FL: Psychological Assessment Resources, Inc.; 1995.
30. Williams GC, McGregor HA, Sharp D, Levesque C, Kouides RW, Ryan RM. Testing a self-determination theory intervention for motivating tobacco cessation: Supporting autonomy and competence in a clinical trial. *Health Psychol* 2006;25:91–101. [PubMed: 16448302]
31. Miller, WR.; Rollnick, S. Motivational Interviewing: Preparing People to Change Addictive Behavior. New York: Guilford Press; 1991.
32. Borrelli B, McQuaid EL, Becker B, Hammond K, Papandonatos G, Fritz G. Motivating parents of kids with asthma to quit smoking: the PAQS project. *Health Educ Res* 2002;17:659–69. [PubMed: 12408210]
33. Borrelli B, McQuaid E, Novak S, Hammond K, Becker B. Motivating Latino Parents of Children with Asthma to Quit Smoking: A Randomized Trial (Accepted pending minor revisions, *Journal of Consulting and Clinical Psychology*).
34. McQuaid EL, Walders N, Borrelli B. Environmental tobacco smoke exposure in pediatric asthma: overview and recommendations for practice. *Clin Pediatr (Phila)* 2003;42:775–87. [PubMed: 14686549]
35. McCaul KD, Hockenmeyer JR, Johnson RJ, Zetocha K, Quinlan K, Glasgow RE. Motivation to quit using cigarettes: A review. *Addictive Behaviors* 2006;31:42–56. [PubMed: 15916861]
36. Winickoff JP, Hillis VJ, Palfrey JS, Perrin JM, Rigotti NA. A smoking cessation intervention for parents of children who are hospitalized for respiratory illness: the stop tobacco outreach program. *Pediatrics* 2003;111:140–5. [PubMed: 12509567]
37. Weinstein ND, Lyon JE, Sandman PM, Cuite CL. Experimental evidence for stages of health behavior change: The pre-caution adoption process model applied to home radon testing. *Health Psychol* 1998;17:445–453. [PubMed: 9776003]
38. Copeland AL, Brandon TH. Testing the casual role of expectancies in smoking motivation and behavior. *Addictive Behaviors* 2000;25:445–449. [PubMed: 10890299]
39. Wright A, French DP, Weinman J, Marteau TM. Can Genetic Risk Information Enhance Motivation for Smoking Cessation? An Analogue Study. *Health Psychol* 2006;25:740–752. [PubMed: 17100502]
40. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977;84:191–215. [PubMed: 847061]

41. Sotsky SM, Glass DR, Shea MT, Pilkonis PA, Collin JF, Elkin I. Patient predictors of response to psychotherapy and pharmacotherapy: Findings in the NIMH treatment of depression collaborative research program. *American Journal of Psychiatry* 1991;148:997–1008.
42. Webb MS, Hendricks PS, Brandon TH. Expectancy Priming of Smoking Cessation Messages Enhances the Placebo Effect of Tailored Interventions. *Health Psychol* 2007;26:598–609. [PubMed: 17845111]
43. Borrelli B, Novak S, Hecht J, Emmons K, Papandonatos G, Abrams D. Home health care nurses as a new channel for smoking cessation treatment: outcomes from project CARES (Community-nurse Assisted Research and Education on Smoking). *Prev Med* 2005;41:815–21. [PubMed: 16182355]

Table 1
Population Demographics and Motivation to Quit

		Overall N (%)	Mean Scores Motivation to Quit (SD)	P-Value
Motivation Score, mean \pm SD		6.85 \pm 2.7	_____	_____
Child Age in years, mean \pm SD		7.13 \pm 1.97	$\hat{R}=.051$.461
Child Gender	Male	121 (58)	6.94 (2.75)	.567
	Female	88 (42)	6.73 (2.56)	
Medicaid	Yes	163 (78)	6.89 (2.78)	.909
	No	46 (22)	6.84 (2.64)	
Parent Race	White	38 (18)	6.53 (2.78)	.353
	Black	120 (58)	6.77 (2.58)	
	Other	51 (24)	7.29 (2.77)	
Parent Hispanic	Yes	44 (21)	7.20 (2.82)	.331
	No	164 (79)	6.76 (2.63)	
Parent Age in years, mean \pm SD		33.59 \pm 7.25	$\hat{R}=.058$.400
Parent Education	< HS	101 (48)	7.07 (2.75)	.255
	\geq HS	108 (52)	6.65 (2.58)	
Parent Employed	Yes	125 (63)	6.82 (2.53)	.162
	No	74 (37)	6.99 (2.87)	
Number of Children in the Home, mean \pm SD		2.71 \pm 1.37	$\hat{R}=.121$.081
Child's Asthma Severity	Mild Intermittent	67 (32)	6.64 (2.80)	.436
	Persistent	142 (68)	6.95 (2.60)	

[^]Correlation coefficient

Table 2
Parent Smoking Behaviors and Motivation to Quit

		Overall N (%)	Mean Scores Motivation to Quit (SD)	P-Value
Cigarettes smoked per day, mean \pm SD		8.62 \pm 6.2	\hat{R} =.067	.334
Smoking is outside the home only	Yes	68 (34)	6.79 (2.77)	.663
	No	130 (66)	6.97 (2.63)	
Reduced # cigarettes smoked in past month	Yes	107 (51)	7.12 (2.41)	.135
	No	102 (49)	6.57 (2.90)	
Ever tried to quit smoking	Yes	175 (84)	7.08 (2.59)	.005
	No	34 (16)	5.68 (2.78)	
Mean # times tried to quit smoking, mean \pm SD		3.88 \pm 8.26	\hat{R} =.086	.249
Planned to quit in the next 30 days	Yes	32 (15)	8.31 (2.21)	.069
	No	124 (85)	7.46 (1.87)	
Cotinine Score, mean \pm SD		2.48 \pm 3.08	\hat{R} =.016	.817

\hat{R} Correlation coefficient

Table 3
Parent Factors and Motivation to Quit

		Overall N (%)	Motivation to Quit Mean (SD)	P-Value
Worry very much about child's health	Yes	115 (55)	6.99 (2.67)	.418
	No	93 (45)	6.69 (2.69)	
Overall rating of child's health is fair or poor	Yes	56 (27)	6.50 (3.05)	.245
	No	152 (73)	6.99 (2.52)	
Caregiver Quality of Life, mean \pm SD		5.29 \pm 1.22	\hat{R} =.016	.819
Parent Stress Score, mean \pm SD		10.04 \pm 3.40	\hat{R} =.038	.582
Parent Depression, mean \pm SD		21.45 \pm 9.37	\hat{R} =.038	.582
Parent perception of good asthma control	Yes	167 (80)	6.65 (2.66)	.031
	No	42 (20)	7.64 (2.60)	
Symptoms would decrease if quit smoking	Yes	63 (33)	7.46 (2.24)	.023
	No	130 (67)	6.53 (2.82)	

\hat{R} Correlation coefficient