



Prevalence of Spit Tobacco Use and Health Effects Awareness in Baseball Coaches

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ABSTRACT *Objectives:* To assess spit tobacco usage and knowledge of health effects in baseball coaches. *Methods:* Participants (N=509) were affiliated with the American Baseball Coaches Association and completed a Web-based survey. *Results:* Data was ascertained in spit tobacco use, health effects, and possible intervention areas. *Conclusions:* The prevalence of use in respondents was 18.5 percent. The authors feel that the coaching profession is a fertile environment to decrease spit tobacco use in adolescents through positive role modeling and appropriate intervention techniques.

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Use of spit (smokeless) tobacco (ST) has become increasingly prevalent throughout the past 30 years, rising to a current annual consumption of nearly 121 million pounds in the United States alone.¹⁻³

ST has been shown to be a health hazard, causing negative health consequences such as oral cancer, oral leukoplakia, dental caries, gingival recession, and nicotine addiction; as well as the lesser-known effects of hypertension, sexual impotence, and cardiovascular disease.^{4,5} When ST use is combined with alcohol consumption, a common pattern found in users, the risk for oral, pharyngeal, and esophageal cancer has been shown to increase.⁶

A 2005 National Collegiate Athletic Association (NCAA) study reported that 16 percent of collegiate athletes used ST on a regular basis.⁷ This percentage is comparable to the previous study (2001) and represents a significant number of ST users in collegiate athletics.⁸ Widespread ST use still occurs in spite of an NCAA regulation, in effect since 1994, that bans the use of spit tobacco products in practice and competition.¹

The highest percentage of ST users came from baseball, a sport long known for heavy consumption. The most recent NCAA survey found that 42 percent of collegiate baseball players were using ST regularly.⁷ This percentage documents that despite the NCAA ban and intervention

efforts targeted toward athletes, especially baseball players, ST use is still prevalent in the sport and among its athletes.^{9,10}

Baseball is an activity that allows ST use because of practice/game situations that are unique to the sport, including the opportunity to use ST products during competition with less concern for hazardous situations.⁹ The lulls in activity and a decreased risk of contact or collision allow for an increased ST consumption during games.

There is often a social norm among baseball players that ST use is acceptable and even “mandated” in ritualistic or superstitious manners.^{9,10} Baseball athletes experience intensive role modeling through the visible ST use of professional players, sports-centered advertising, and promotional programs with free samples.⁹ Sport-specific use and role modeling are evident with research reporting that 59 percent of collegiate baseball athletes in one study predominantly used ST during the competitive baseball season or used it dramatically more during the season than out of season.⁹

Coaches must be actively involved in efforts to decrease ST consumption in baseball. These individuals are capable of playing a substantial role in the prevention, rules enforcement, and referral for treatment of addiction for their athletes.⁹ Coaches can be an integral aspect of this effort because they are often a role model for athletes, have access to the athletes at the different stages of ST use (initiation, experimentation, and regular use), and have an enormous influence over their team.^{11,12}

Despite the potential opportunity to spearhead the effort to decrease ST use in baseball, coach-driven interventions are relatively uncommon. There are numerous potential reasons for a lack of coach-led initiatives; however, for the purpose of this research, the

authors will investigate personal ST use and individual perceptions of use.

There is little known about ST use patterns in coaches or their personal beliefs on the use of tobacco products. What is known about coaches is often derived from the athletes’ perceptions. These students often believe that coaches are indifferent about the individual athlete’s spit tobacco use.^{13,14} Also, athletes are often confused and surprised by the mixed messages conveyed by coaches who are chewing tobacco at sporting events or practice.¹⁵

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Coaches should recognize that their own use, knowledge, attitudes, or indifference toward spit tobacco might have a powerful influence on their athletes.^{16,17} Research has demonstrated that ST use in baseball players was three times higher on a team where the coach also was an ST user.⁹ Because of these concerns, it is essential coaches reconsider any personal ST use and how it may be perceived by their athletes while also developing an awareness of athletes who use ST and those who may be at risk.

In order to better understand the ST habits and behaviors of coaches, the authors developed a Web-based survey specifically for baseball coaches. The study was designed to assess the prevalence of the coaches’ use, factors influencing use, level of knowledge about the health effects of ST, and the role coaches play in

intervention. The authors hypothesized there would be a high percentage of ST use in the coaching population that is similar to the percentage of NCAA baseball athletes who consume ST.

Methods

Subjects in this study were members of the American Baseball Coaches Association (ABCA) supervising teams in high schools; NCAA divisions I, II, or III; NAIA; or community/junior colleges. The coaches received a personal e-mail requesting their assistance in the information-gathering portion of this study. The survey was sent to 4,253 baseball coaches listed on an ABCA-provided list serve. Those who were willing to participate were provided a Uniform Resource Locator (URL) address they could access in order to complete the survey.

Of those initial e-mail addresses, 1,175 were returned as undeliverable, resulting in 3,078 potential respondents. After submitting the initial request and two subsequent reminder notices, 509 surveys were completed for a response rate of 16.5 percent.

The choice to use a Web-based survey was made to reduce the time and cost of conducting a mail survey and to avoid the tedious and error-prone task of data entry.¹⁸ This study specifically used a program that could only be accessed through the initial e-mail requesting participation. The program also prevented coaches from submitting information more than once to eliminate repeat responses.^{18,19}

Research has determined that personalized follow-up contact with nonrespondents would dramatically increase the response rate for surveys.¹⁹ The program created for this study was designed to send follow-up e-mails only to those coaches who had not initially responded while also maintaining anonymity for all subjects whether they responded or not.

The survey assessed four areas relating to ST: demographic factors, ST use, knowledge of the potential positive and negative health effects of ST use, and personal intervention roles. All questions were derived from surveys utilized in previous studies of baseball athletes and coaches.^{7,16} The prevalence of ST use and the knowledge of the effects of ST use were measured using descriptive statistics through SPSS. The results then were evaluated and compared for significance to the relevant population.

Results

The demographic information derived from the study (**TABLE 1**) demonstrated that the respondents were consistent in gender (99.2 percent male) and ethnicity (90.8 percent Caucasian). There was more diversity found in age ranges with 30-39 (25.5 percent), 40-49 (27.9 percent), and 50-59 (28.5 percent) having the highest response rates.

High school coaches (38.9 percent) were more likely to complete the survey, although all team levels were represented. Head coaches (67 percent) also were more likely to respond than assistant coaches (25.1 percent).

The ST use section requested information on whether a coach used ST, the starting age range for ST use, the primary reasons for initiating use, the frequency of use, and the difference between ST use in and out of season (**TABLE 2**). The authors found that the prevalence of ST use among baseball coaches (18.5 percent) was similar to that seen in collegiate athletes of all sports responding to an NCAA study (2005) on social drug use (16.4 percent), but far less than that seen in collegiate baseball players (42 percent) responding to the same study.⁷

Within the health effects section of the survey, the respondents were given a list of potential positive and nega-

TABLE 1

Demographic Data of Spit Tobacco Study

Demographics		n (%)
Sex		
	Male	505 (99.2)
	Female	2 (0.4)
	N/A	2 (0.4)
Age (years)		
	20-29	44 (8.6)
	30-39	130 (25.5)
	40-49	142 (27.9)
	50-59	145 (28.5)
	60+	44 (8.6)
Ethnicity		
	Hispanic	19 (3.7)
	African-American	7 (1.4)
	Asian	2 (0.4)
	Native American	5 (1.0)
	Caucasian	462 (90.8)
	Other	2 (0.4)
Coaching position		
	Head coach	341 (67)
	Assistant coach	128 (25.1)
	Other	40 (7.9)
Team level		
	High school	198 (38.9)
	NCAA Division I	83 (16.3)
	NCAA Division II	35 (6.9)
	NCAA Division III	69 (13.6)
	NAIA	26 (5.1)
	Community/junior college	40 (7.9)
	Other	52 (10.2)

tive health effects of ST use, and asked if the health issues could be affected by ST consumption (**TABLES 3 AND 4**). The respondents were well aware that ST use did not improve athletic performance (97.2 percent), that there were harmful effects to ST use (95.1 percent), including addiction (96.1 percent), and that physical activity did not offset those harmful effects (97.2 percent).

Overall, the respondents were knowledgeable about the effects associated with ST use. The coaches appropriately connected ST use with oral leukoplakia (82.5 percent), oral cancer (96.7 percent), tooth decay (87.6 percent), gingival recession (89 percent), and nicotine addiction (95.1 percent). However, the more systemic illnesses — stomach ulcers (72.5 percent) and cancer (70.7 percent), hypertension

TABLE 2

Spit Tobacco Use in Respondents

Spit tobacco use		n (%) [% of spit tobacco users]
Use by coach		
	No	390 (76.6)
	Yes, but I have stopped	21 (4.1)
	Yes	94 (18.5)
Tried to quit before		
	No	23 (4.5) [24.4]
	Yes, once	15 (2.9) [15.9]
	Yes, several times	56 (11) [59.6]
Spit tobacco use starting age		
	Jr. high school or before	15 (2.9) [13]
	High school	36 (7.1) [31.3]
	18-19 years old	25 (4.9) [21.7]
	19+ years old	39 (7.7) [33.9]
Primary reason for use		
	Recreational/Social	45 (8.8) [47.9]
	Stress relief	24 (4.7) [25.5]
	Makes me feel good	25 (4.9) [26.6]
Primary reason to start use		
	Other teammates/players	65 (12.8) [65]
	Professional players	8 (1.6) [8]
	Coach using spit tobacco	1 (0.2) [1]
	Family members/friends	22 (4.3) [22]
	Promotional ads	4 (0.8) [4]
Use in-season vs. off-season		
	I don't use in-season	11 (2.2) [10.2]
	Less in-season	12 (2.4) [11.2]
	No difference	43 (8.4) [40.2]
	More in-season	41 (8.1) [38.3]
Do you use around players?		
	No	64 (12.6) [58.7]
	Yes	45 (8.8) [41.3]
Do you use at practices?		
	No	54 (10.6) [50]
	Yes, 1-2 times/week	28 (5.5) [25.9]
	Yes, 3+ times/week	26 (5.1) [24.1]
Do you use at games?		
	No	72 (14.1) [66.7]
	Yes, 1-2 times/week	17 (3.3) [15.7]
	Yes, 3+ times/week	19 (3.7) [17.6]

(63.7 percent), cardiovascular disease (60.8 percent), delayed wound healing (37.9 percent), and sexual impotence (28.9 percent) — were less likely to be perceived as an adverse effect of ST use according to the study population.

Finally, the coaches were asked to describe ST use in their athletes and if intervention would be effective in this population (TABLE 5). Less than half of the coaches who responded to this survey (48.5 percent) reported that ST use was a problem at least among some of their athletes. Most coaches believed that adolescent athletes should not become involved with ST (92.3 percent) because it can lead to long-term addiction or the other negative health effects mentioned previously. The coaches also reported being capable of positively influencing the athletes' decisions and providing assistance in their efforts to stop ST use once they had begun (55.8 percent), even if it is considered only in a small manner (40.5 percent).

Discussion

The data evaluating the prevalence of ST use within the coaches suggested that baseball coaches who responded to this study did not consume ST as frequently (18.5 percent) as collegiate baseball athletes who responded to the NCAA study (42 percent).⁷

This is a positive trend considering the number of coaches who competed in collegiate and/or minor league baseball and have been exposed to the same expectations or rituals their players currently face. Because of this prior experience in baseball and their position of authority with the team, the coaches who do not use ST have a distinct opportunity to demonstrate a healthy role model for their players to emulate.

Within ST users specifically, the study found that 15.9 percent had attempted

to quit use once and 59.6 percent had attempted to quit several times without success. This statistic reinforces the addictive nature of tobacco products and the difficulty associated with attempting to discontinue use. Knowing tobacco addiction is a serious concern, coaches should use all means necessary to stop use personally and utilize all appropriate intervention techniques to stop or prevent ST use in their athletes.

The average age the respondents started using ST is relatively balanced between high school and college. This is consistent with the NCAA study in regard to high school students and college freshmen, with both reporting a high percentage of athletes began use during this age range.⁷ However, the authors' study findings differed from the NCAA study with regard to the category of 19-plus years old (one to two years after high school).

The NCAA study found this group to have the lowest ST initiation (9.7 percent) compared to other age groups while the authors' research found the highest percentage of initiation (33.9 percent).⁷ This result might potentially be dictated by the playing ability of the coaches, in that many of them could possibly have deferred entrance to college to play minor league baseball where ST use is high (31 percent), although the exact reasoning could not be determined by this study.⁴

The primary reason provided for consuming ST was for recreational/social purposes (47.9 percent), the same as found in the NCAA study for athletes.⁷ No coach in the study reported consuming ST to improve athletic performance, which suggests they are aware research has found no correlation between ST use and athletic improvement.⁴ The ST users in this study stated that the primary reason to initiate use was based on seeing teammates or other players

TABLE 3

Respondents' Perception of Health Effects of Spit Tobacco

Health effects of spit tobacco use		n (%)
Improve athletic performance		
	True	4 (0.8)
	False	495 (97.2)
Physical activity offsets effects		
	True	5 (1)
	False	495 (97.2)
No harmful effects with use		
	True	17 (3.3)
	False	484 (95.1)
No one can be addicted		
	True	15 (2.9)
	False	489 (96.1)

TABLE 4

Respondents' Perception of Negative Health Effects of Spit Tobacco

Negative health effects caused by spit tobacco use	True n (%)	False n (%)
Oral cancer	493 (96.7)	16 (3.1)
Oral leukoplakia (pre-malignant lesion)	420 (82.5)	89 (17.5)
Tooth decay	446 (87.6)	63 (12.4)
Gingival recession	454 (89)	55 (10.8)
Nicotine addiction	484 (95.1)	25 (4.9)
Stomach ulcers	369 (72.5)	140 (27.5)
Stomach cancer	360 (70.7)	149 (29.3)
Hypertension	324 (63.7)	185 (36.3)
Cardiovascular disease	310 (60.8)	199 (39)
Sexual impotence	147 (28.9)	362 (71.1)
Delayed wound healing	193 (37.9)	316 (62.1)

with ST. These findings suggest that parents and coaches can directly impact the decision-making process of their athletes by not demonstrating use, which inadvertently endorses the product.

The data also represents the influence of peer role modeling and peer pressure, whether intentional or not. This provides a definitive starting point for intervention techniques, either within the team or in society in general. Decreasing ST use in athletes and coaches will dimin-

ish the peer modeling and pressure that can lead to ST initiation in other athletes and in the general student population.

The positive role modeling for healthy behavior the authors discussed unfortunately did not carry over to the coaches who use ST. There was an obvious increase in use by the coaches during the baseball season, a possible response to the atmosphere of the sport or to the stress of the season causing an increased desire for ST. The coaches did not choose

TABLE 5

Spit Tobacco Intervention Roles		
<i>Intervention roles</i>		<i>n (%)</i>
Is spit tobacco use a problem with your athletes?		
	No, it is not	251 (49.3)
	Yes, with some athletes	229 (45)
	Yes, with most athletes	18 (3.5)
Should adolescent/college-age athletes use spit tobacco?		
	No, they should not	470 (92.3)
	Yes, if they understand the risk	29 (5.7)
	Yes, they should be allowed no matter what	3 (0.6)
Can adolescent users quit with intervention?		
	No, it does not help	11 (2.2)
	Yes, but only if they want to quit	318 (62.5)
	Yes, intervention can help anyone	167 (32.8)
Do coaches play a role in preventing spit tobacco use?		
	No, we do not	22 (4.3)
	Yes, in a small way	118 (23.2)
	Yes, we can help prevent use	358 (70.3)
Can coaches help athletes who want to stop use?		
	No, they do not want our help	7 (1.4)
	Yes, in a small way	206 (40.5)
	Yes, they need our help to stop use	284 (55.8)

to refrain from consuming ST around players or at practice, although use did decrease dramatically from 50 percent to 33.3 percent during competition. The decrease in use may be the result of high school and collegiate regulations against the use of ST during games or the enforcement of the regulations by outside officials (umpires or administrators).

In the third category of survey questions, the coaches demonstrated they were quite knowledgeable in most of the health effects of ST use. The coaches were given a list of potential negative health effects and asked whether or not they were associated with ST use. All of the listed health effects have been previously reported to be associated with ST usage.^{4,5} Overall, the respondents were knowledgeable about the direct effects

associated with ST use. The coaches appropriately correlated ST use with oral leukoplakia, oral cancer, tooth decay, gingival recession, and nicotine addiction.

However, once the health effects became more systemic, the coaches appeared to be less certain that ST use could cause the health concerns. Therefore, it appeared the coaches were aware of the negative health effects of ST use that are relatively obvious, specifically mouth issues and addiction, but less knowledgeable on the general health effects and systemic diseases that may be caused by use.

These findings suggest that education regarding the vast array of negative health effects related to spit tobacco should be readily accessible to both coaches and athletes in an attempt to increase knowledge on the subject, which could potentially

minimize use in both groups. A thorough understanding of these health effects may be a straightforward method for decreasing incidence of use and limiting the initiation of use in athletes and coaches.

Finally, the respondents to the survey answered several questions related to intervention, both in its effectiveness and the role of coaches in assisting athletes during their quest to quit. Less than half of the coaches who responded to this survey reported that ST use is a problem at least among some of their athletes. With the NCAA study reporting a 42 percent usage rate in baseball, it was surprising that the majority of coaches do not consider ST use an issue with their team.⁷ This study did not determine if the respondents had implemented a strict policy that decreases student use or if the coaches were unaware of or chose to ignore the ST usage by their players. Further study should more thoroughly investigate this issue. The respondents stated they firmly believed adolescents should not be allowed to use ST because of the adverse health risks associated with tobacco use.

The majority of respondents agreed that ST users could discontinue the habit with proper intervention if they had the desire to quit. The coaches also understood they could play a role in preventing ST use and helping athletes who wish to stop using ST. The respondents felt their position as a positive role model and a leader for the students on their teams provided the opportunity to prevent an athlete from starting ST, even if it is in some small way, such as providing a healthy behavior model for the team by not using ST.

Developing the understanding in baseball coaches that they can be positive role models for their athletes is essential in the effort to rid the sport of ST addiction and the positive perception

of its use. If the coaches would utilize explicit and tacit efforts to guide the athletes on their team away from ST use, baseball would be better able to decrease adolescent and collegiate athlete addiction to this dangerous drug.

Future research on this topic is warranted based on the results of this study and should focus on high school coaches specifically. Numerous studies, including this one, have shown there is a high incidence of initial ST use and habit development during the high school years.^{4-6,9,14,16,17} This important maturation and formative period of an adolescent's life should be evaluated more thoroughly to ensure that the role models who influence these athletes are providing a positive, healthy image.

Secondly, the specific intervention techniques utilized by these coaches should be investigated to ensure they are appropriate and successful in attempts to prevent and decrease use in students. If the current intervention techniques are ineffective, inappropriate, or do not exist, then a cohesive program should be implemented in as many school districts as possible to assist the coaches in their efforts to remove ST from the sport.

The limitations of this study are related specifically to the response rate. While lower than anticipated, there appears to be a current national trend of decreasing response rates to both Web-based and mailed surveys.^{20,21} A meta-analysis conducted by Sheehan found that the mean response rate for all forms of survey research was at a rate of only 24 percent.²⁰ A review of previous Web-based research studies in ST prevalence among athletes, tobacco use studies, and research in other nonhealth domains found comparable or lower response rates (12-18 percent) than the authors' current response rate of 16.5 percent.²¹⁻²⁴ This suggests the

response rate for this study was similar to related research and consistent for this research tool.²¹⁻²⁴ The lower response rate seen throughout Web-based research may reflect a general decline in responses to electronic surveys in this and other fields in recent years.²¹ Although Web-based surveys are still a relatively novel methodological tool and response rates tend to be lower than traditional telephone and mail surveys, they have been found to generally be efficient, accurate, and cost-effective research tools.²¹⁻²⁴

OPEN DISCOURSE
regarding ST use and the
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demonstrate that the
majority of coaches act as
positive, healthy role models.

Possible reasons for the lower response rate to this specific survey could be related to an increase in the number of surveys received by each potential subject, a lack of available time, or a lack of computer proficiency within the sample group. Also, there is the possibility the response rate could be affected by the coaches' concern for the public perception of their field/sport, or concerns for their privacy and the privacy of their athletes. The researchers, through the anonymity provided to respondents and the large sample size, attempted to minimize these concerns as much as possible.

A second limitation for this study was the potential for responder and nonresponder bias. Because of the anonymity of the coaches' responses, it was impossible to determine any demographic differences between responders and

nonresponders. However, it was possible that a self-selection process occurred, especially among ST users, when coaches decided whether or not to respond to the survey request. Nonrespondents may have chosen not to complete the survey because of personal ST use. Therefore, there is a possible underestimation of ST use among baseball coaches based on the responses of this survey. Because of the structure of this specific survey, it was not possible to quantify the response or nonresponse bias that may have been present. Future research should further assess prevalence of ST use in baseball coaches to validate these results and determine if baseball coaches are acting as positive role models and providing the optimal lifestyle examples for their athletes.

Coaches and respondents should bear in mind that the overarching negative perception associated with baseball and ST use can only be allayed through full disclosure in future research. Open discourse regarding ST use and the sport of baseball may help demonstrate that the majority of coaches act as positive, healthy role models, and that they take the initiative to protect their athletes from the possible effects of ST use.

In conclusion, this study demonstrated a lower than expected rate of ST use in baseball coaches when compared to use in collegiate baseball players, which is a promising result. The coaches have a solid understanding of the negative health effects associated with ST use, understand their potential role in intervention techniques, and are willing to attempt to minimize use within their athletic population.

This study provided an initial understanding of baseball coaches and their modeling of healthy behaviors for athletes. The authors feel the coaching profession is a fertile environment for the education of adolescents and collegiate students

that needs to be thoroughly utilized to decrease ST use within the athletic population and minimize initiation of this addictive habit. Positive role modeling, intervention training, or modification of current intervention techniques can only improve the opportunity that coaches have available to reach out to the athletes who need assistance and guidance. ■■■■

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