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Abstract

In this study, a sport-specific adaptation of Family Behavior Therapy (i.e., The Optimum Performance Program in Sports [TOPPS]) in a collegiate athlete was examined, including a controlled evaluation of several of its intervention components utilizing multiple-baseline methodology. After a 3-week baseline consisting of program orientation, cultural enlightenment, and goal development was established for unsafe sexual practices, alcohol binge drinking (four or more drinks per occasion), and teammate relationships, the participant was sequentially and cumulatively exposed to three distinct intervention phases across 12 meetings. In the first phase, a Dynamic Goals and Rewards intervention was implemented with the intention of reducing unsafe sexual practices. In the second phase, alcohol avoidance was additionally targeted through Goal Inspiration (Consequence Review; that is, a motivational enhancement exercise), Self-Control, and Environmental Control. The third phase focused on teammate relationships using Communication Skills Training while the aforementioned target areas continued to be addressed. A brief probe assessment was administered immediately before each intervention meeting to assess frequency of unprotected sex, frequency of binge drinking, and relationship problems with teammates. Results indicated that each of the target behaviors reduced substantially, but only after they were targeted. The participant's scores on a standardized measure of troublesome thoughts and stress substantially decreased across intervention meetings. Various mental health and sport performance outcome measures, in addition to the aforementioned target areas, improved up to 5 months post-intervention.

Keywords

evidence-based practice, HIV/STI risk, student-athlete, substance use

I Theoretical and Research Basis for Treatment

The unique academic, sport, and social environment of collegiate student-athletes contributes to increased stress that often interferes with their optimization of mental health (Heyman, 1986).

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College athletes consistently evidence higher rates of substance use than non-athletes (Ewing, 1998; Leichliter, Meilman, Presley, & Cashin, 1998; Nelson & Wechsler, 2001). Indeed, approximately 80% of intercollegiate athletes have consumed alcohol in the past 12 months (Green, Uryasz, Petr, & Bray, 2001), and 55% have been identified to engage in heavy episodic drinking in the past 2 weeks (Leichliter et al., 1998). In comparison with alcohol, prevalence of illicit drug use among student-athletes appears to be considerably lower (Green et al., 2001). Lisha and Sussman (2010) conducted a comprehensive review of 15 studies and found evidence for an inverse relationship between sports participation and illicit drug use, but acknowledged inconsistent findings. Some studies reported that college athletes were less likely to use illicit drugs than non-athletes (Anderson, Albrecht, McKeag, Hough, & McGrew, 1991; Ford, 2008), whereas other studies found higher illicit drug use among collegiate student-athletes (Ewing, 1998). Therefore, the current literature appears to indicate that alcohol may be particularly problematic in collegiate athletes.

Approximately 6% (MacDonald et al., 1990) to 12% (Patrick, Covin, Fulop, Calfas, & Lovato, 1997) of sexually experienced college students have evidenced a sexually transmitted infection (STI), and 14% (Patrick et al., 1997) to 22% (Wiley et al., 1996) have been pregnant or impregnated a partner. Only a minority of college students take protective actions to prevent STIs or pregnancy (Caldeira, Singer, O'Grady, Vincent, & Arria, 2012; Douglas et al., 1997). Substance use is one factor that may contribute to high-risk sexual behaviors such as having multiple or casual sex partners (Cooper, 2002) and failing to use condoms or birth control, which thereby increases HIV/STI transmission and unplanned pregnancy. Relative to non-athletes, collegiate athletes may be at an increased risk, as they report more sexual partners, unsafe sex, and drinking before or during sex (Grossbard, Lee, Neighbors, Hendershot, & Larimer, 2007).

College athletes may experience problems with their mental health due to balancing multiple obligations and experiencing many stressors related to academics, athletic performance, time demands, and injury. For instance, prevalence rates of 21% for depression symptoms have been reported with Division I collegiate student-athletes (Yang et al., 2007). College female athletes are particularly at risk for social anxiety and depressive symptoms because they have less social support than male athletes and non-athletes (Storch, Storch, Killiany, & Roberti, 2005). The presence of underlying psychiatric symptoms may be a potential antecedent or consequence of substance use, as college athletes with higher alcohol use evidence more severe psychiatric symptoms (Miller, Miller, Verhegge, Linville, & Pumariega, 2002).

Although a growing number of athletic departments have recognized the need to address substance use and mental health (Gill, 2008), student-athletes typically have less positive attitudes toward mental health services, and underutilize campus counseling centers relative to non-athletes (Watson, 2005). One potential way to facilitate engagement and retention of athletes in mental health programs is to adjust interventions to fit sport culture. For instance, athletes value methods of enhancing their sport performance and team relationships. Addressing cognitive and behavioral problems experienced by athletes that interfere with performance (e.g., substance use, academics, thoughts and stress, injury) is likely to improve their motivation to pursue psychologically based interventions (Donohue, Silver, Dickens, Covassin, & Lancer, 2007). Likewise, focusing on relationship enhancement and support by systematically involving coaches, teammates, family, and peers into the intervention process reflects a team-oriented approach to goal attainment.

Although sport-specific considerations, such as athletic performance and team relationship building, are recommended in the development of substance abuse programs for athletes (Martens, Dams-O'Connor, & Beck, 2006), only two intervention studies have been conducted to concurrently address mental health concerns (including substance abuse) and sport performance in athletes (Donohue, Chow, et al., 2014; Pitts et al., 2014). In these studies, Family Behavior Therapy (originally developed in controlled trials for substance abuse involving

non-athletes; Azrin, Donohue, Besalel, Kogan, & Acierno, 1994; Azrin et al., 2001; Azrin, McMahon, et al., 1994; Donohue, Azrin, et al., 2014) was adapted specifically for use in athletes (designated The Optimum Performance Program in Sports [TOPPS]). TOPPS was shown to demonstrate noticeable improvements in drug and alcohol use, safe sexual practices, mental health, sport performance, and relationships in college athletes. However, these evaluations were uncontrolled. The purpose of the current outcome study was to examine, utilizing controlled multiple-baseline methodology, the effects of TOPPS in one of the collegiate athletes who participated in the initial evaluation study (Donohue, Chow, et al., 2014). This athlete presented to intervention with a history of substance abuse, unsafe sexual activity, and relationship difficulties. To maintain the participant's confidentiality, some of the descriptive information about this case was altered slightly.

2 Case Introduction

Michelle presented to the program as a collegiate athlete in her early 20s. She was a self-referral who learned about the program from a performance workshop conducted with her team. The workshop was conducted to provide awareness of the services offered by TOPPS, and involved a demonstration of several mental skills interventions specific to sport performance.

3 Presenting Complaints

Michelle reported negative consequences resulting from her past alcohol use, including dismissal from a competitive team. She was interested in learning new techniques to use in sport, academics, and life. She wanted to improve her coping skills, work ethics, concentration, leadership, time management, and relationships with teammates. The current study was approved by an institutional review board for the protection of human participants. Michelle provided informed consent for the study within the umbrella of a federal certificate of confidentiality.

4 History

Michelle was a toddler when she initiated her primary sport, and her first competition occurred when she was in her mid-teenage years. She participated in several other sports throughout her child and adolescent years, but reported that she lacked passion in these sports. Ultimately, Michelle reported that she focused solely on her primary sport because she was competent in this sport, and it "kept her busy." At the time of referral, Michelle indicated that she was committed to her sport because she wanted to establish friendships with her teammates and improve her abilities.

Michelle's onset of alcohol and marijuana use occurred when she was in her mid-teenage years. Michelle reported that she was initially motivated to use substances to establish friendships. In college, she indicated that her drinking motives changed as she began to enjoy the feeling of being intoxicated. Michelle typically consumed 10 to 20 alcoholic beverages when she drank, which increased her risk of experiencing negative alcohol-related consequences. Interestingly, Michelle believed that she performed better in practice when she drank the previous night, reporting that she would overcompensate for her drinking by being "hyper focused in practice," so her coach and teammates would not suspect that she had drunk the previous night. In addition to alcohol and marijuana, Michelle used ecstasy (MDMA) twice in college.

The first time Michelle had unprotected sex was when she was 16 years old. She was in a monogamous relationship at the time and believed there was no risk for contracting an STI. At the time of referral, Michelle was engaging in unprotected sex with one partner and was not using hormonal birth control.

The quality of Michelle's relationships varied across significant others. She reported that her relationship with her father was poor, and that other family members provided financial support for her college expenses. Although Michelle indicated that she communicated with family members "regularly," she generally felt disconnected from her family. Michelle reported that the head coach had high expectations for her and was critical at times. She reported "close relationships" with several teammates, but preferred to spend time with other friends.

5 Assessment

Pre-Intervention, Post-Intervention, 2- and 5-Month Follow-Up

A comprehensive battery of assessment measures was administered by trained assessors who were blind to experimental design 41 days before intervention implementation, and 8, 56, and 142 days after the completion of intervention. This battery included the following:

Structured Clinical Interview for *DSM-IV* (SCID-IV; American Psychiatric Association [APA], 1994; Spitzer, Williams, Gibbon, & First, 1992) is a structured diagnostic interview utilized to assess a variety of *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; APA, 1994) disorders. In the current study, the SCID-IV was used to establish presence of a substance use disorder at pre-intervention assessment. Timeline Follow-Back (TLFB; Sobell, Sobell, Klajner, Pavan, & Basian, 1986) was used to assess frequency of alcohol binge drinking, marijuana use, hard drug use (illicit drugs other than marijuana), and unprotected sex during the 161 days preceding intervention (pre-intervention assessment), 85 days of intervention (post-intervention assessment), 56 days subsequent to intervention (Follow-up 1), and 57 to 142 days after intervention (Follow-up 2). Urine drug screens, obtained from Redwood Toxicology Laboratory, utilizing conventional cutoffs were used to substantiate the presence or absence of amphetamines, barbiturates, benzodiazepines, oxycodone, and anabolic steroids, and hair follicle drug testing was used to detect cocaine, opiates, methamphetamines, phencyclidine, and tetrahydrocannabinol [THC], at each of the four assessment periods. The Sport Interference Checklist (SIC; Donohue, Silver, et al., 2007) assesses cognitive and behavioral problems experienced by athletes in both training and competition. Participants rate how often each item interferes with their performance during training and separately during competition on a 7-point Likert-type scale ranging from 1 (*never*) to 7 (*always*). The training scale has four factors (Dysfunctional Thoughts and Stress, Academic Problems, Injury Concerns, Poor Team Relationships), and the competition scale has six factors (Dysfunctional Thoughts and Stress, Academic and Adjustment Problems, Lack of Motivation, Overly Confident and Critical, Injury Concerns, Pain Intolerance). Higher scores are indicative of greater interference in sport performance. The Student Athlete Relationship Instrument (SARI; Donohue, Miller, Crammer, Cross, & Covassin, 2007) assesses sport-specific problems in relationships of athletes with their teammates, family, coaches, and peers. Problem statements within each of the SARI relationship scales are rated for agreement using a 7-point Likert-type scale ranging from 1 (*extremely disagree*) to 7 (*extremely agree*). Higher scores are indicative of greater relationship problems. The Symptom Checklist-90-R (SCL-90-R; Derogatis, 1994) assesses a broad range of mental health symptoms. The SCL-90-R consists of nine dimensions (Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, Psychoticism) and a Global Severity Index. Participants are provided a list of problems, and are asked to rate how much the problem has distressed or bothered them during the past 7 days on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*). Raw scores for each subscale were converted to *T* scores based on norms for non-patient females. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report instrument that measures severity of depression. Participants rate each symptom that describes the way they have been feeling during the past 2 weeks on a

4-point scale ranging from 0 to 3. A total score is calculated by summing the responses across items. Scoring guidelines include 0 to 13 (minimal depression), 14 to 19 (mild depression), 20 to 28 (moderate depression), and 29 to 63 (severe depression). The Client Satisfaction Questionnaire-8 (Attkisson & Zwick, 1982) was used to assess quality of service received. Higher scores reflect greater quality and satisfaction with services received. A total score may be derived by calculating the average of the eight items. A four-item evaluation (7-point scale) was developed specifically for this study to assess the performance coach (i.e., provider) who implemented intervention. Higher scores reflect greater helpfulness, skill, comfort, and program effectiveness. Finally, a five-item questionnaire (7-point scale) was utilized to assess the extent to which the participant believed TOPPS was successful in reducing HIV/STI risk and substance use, and improving sport performance, relationships, and mental health.

Pre-Intervention Assessment Results

Michelle's pre-intervention results on the SCID-IV indicated that she met *DSM-IV* criteria for lifetime alcohol abuse. On the TLFB, Michelle reported 8 days of alcohol binge drinking (1.49 days/mo.), 118 drinks (21.9 drinks/mo.), 1 day of marijuana use (0.19 days/mo.), and 27 days of unprotected sex (5.03 days/mo.) in the past 161 days. She reported no days of hard drug use, which was consistent with the negative urinalysis and hair follicle results. Thus, her baseline assessment indicated that she evidenced no problems with marijuana or hard drug use, but did engage in dangerous binge drinking and unprotected sexual activity.

Table 1 includes Michelle's responses to the SIC, SARI, SCL-90-R, and BDI-II measures at baseline assessment. The SIC scores indicated that Michelle was experiencing dysfunctional thoughts and stress, and to a lesser extent problems in academics, that were reported to interfere with her training and competition. SARI subscale scores for Family, Coaches, and Peers were low, suggesting these relationships were not affecting her sport participation. In contrast, SARI Teammates subscale scores were relatively high, indicating that her relationships with teammates were negatively affecting her sport participation. Pre-intervention assessment results for the SCL-90-R revealed that she was elevated on several dimensions specific to mental health symptoms, including Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Psychoticism, and the Global Severity Index. The elevated SCL-90-R Depression dimension was consistent with her mildly elevated BDI-II total score of 13.

6 Case Conceptualization

Michelle's alcohol use was conceptualized to be chiefly maintained by classical conditioning, operant conditioning, and modeling. Consistent with other athletes, the onset of Michelle's alcohol use occurred during high school at parties and get-togethers with friends and teammates. Throughout high school, she observed esteemed others (family at home and older students, particularly athletes in her peer group) getting intoxicated. These observations demonstrated appropriateness of alcohol use (modeling). She was interpersonally reinforced during drinking games, and recalled that her experiences with alcohol were fun (positive reinforcement) and without serious negative consequences. As she transitioned into college, Michelle considered alcohol use a normal part of the college experience. Although her alcohol use frequency decreased from high school to college, her binge drinking frequency increased. Excitement with upcoming get-togethers and parties (common antecedents to alcohol use) was associated with positive peer interaction, pleasurable feelings, and thoughts (classical conditioning). Throughout college, she increasingly enjoyed the taste of alcohol and effects of intoxication, including reduction of stress (negative reinforcement), sense of belongingness, acceptance by peers, positive emotions, and social interactions (positive reinforcement). Although negative consequences, such as hangovers,

Table 1. Pre-, Post-, and Follow-Up Results for SIC, SARI, SCL-90-R, and BDI-II.

Variable	Pre-assessment	Post-assessment	Follow-up 1	Follow-up 2
SIC training				
Dysfunctional thoughts and stress	3.67	1.83	1.67	2
Academic problems	2.67	1.33	1.33	1.67
Injury concerns	1	1.33	1	1
Poor team relationships	1	1	1	1
SIC competition				
Dysfunctional thoughts and stress	3.5	1.63	2.13	2.38
Academic and adjustment problems	3	1.33	1.33	1
Lack of motivation	1.25	1	1	1
Overly confident and critical	3	1	1.50	1.50
Injury concerns	1	1	1	1
Pain intolerance	1	1	1	1
SARI teammates				
Poor relationship and lack of support	3	1	1	1
Pressure to use illicit drugs and being difficult during training	1	1	1	1
Not a team player and too non-competitive	3	1	2	2.50
Poor relationship	4	1	1.25	1
Pressure to drink alcohol and interfere during competition	1	1	1	1
SARI family				
Poor relationship and lack of support	1.80	1	1	1.40
General pressure	1	1	1	1
Pressure to quit or continue unsafely	1	1	1	1
Embarrassing comments and negative attitude	1	1	1	2.50
SARI coaches				
Poor relationship and lack of support	1	1	1	1.33
Lack of concern for teamwork and safety	1	1	1	1
Lack of involvement and high expectations	1	1	1	1
Too demanding	1.67	1	1	1
SARI peers				
Poor relationship and lack of support	1	1	1	1
Use of recreational and performance-enhancing substances	1	1	1	1.33
SCL-90-R				
Somatization	1.08 (63)	0.42 (53)	0 (35)	0.17 (46)
Obsessive-compulsive	1.40 (66)	0.10 (44)	0 (37)	0.10 (44)
Interpersonal sensitivity	0.67 (61)	0 (39)	0 (39)	0.11 (47)
Depression	1.15 (63)	0.08 (42)	0 (34)	0 (34)
Anxiety	0.40 (55)	0.10 (44)	0 (37)	0 (37)
Hostility	0.50 (57)	0.17 (49)	0 (40)	0.33 (54)
Phobic anxiety	0 (44)	0 (44)	0 (44)	0 (44)
Paranoid ideation	0 (41)	0 (41)	0 (41)	0 (41)
Psychoticism	0.40 (63)	0 (44)	0 (44)	0 (44)
Global severity index	0.69 (61)	0.10 (41)	0 (30)	0.07 (38)
BDI-II total	13	0	2	5

Note. For SCL-90-R, *T* scores are presented in parentheses. Follow-up 1 = 2 months post-intervention, Follow-up 2 = 5 months.

SIC = Sport Interference Checklist; SARI = Student Athlete Relationship Instrument; SCL-90-R = Symptom Checklist-90-R; BDI-II = Beck Depression Inventory-II.

saying embarrassing things, and arguments with others periodically occurred, these experiences were often delayed and rationalized.

Throughout high school and college, Michelle frequently engaged in sexual activities without condoms. This behavior was reinforced in several ways, including (a) her relationships with sexual partners who reported that condoms decreased their pleasure, (b) inconvenience of condoms during sexual activity, (c) Michelle's lack of assertiveness in requesting her partners to wear condoms, and (d) Michelle's lack of concern in regard to contracting an STI due to her participation in monogamous sexual relationships and regular HIV testing.

Her mild symptoms of depression and thought disturbance were likely influenced by alcohol use (e.g., saying things that she regretted during intoxicated states), and lack of communication skills in assertively asking teammates and coaches to do things that were desired. Moreover, she also established very high standards for herself, and often became "hard" on herself and others when she was unable to accomplish tasks. Similarly, she evidenced very specific thoughts about how things should be, and had a tendency to be critical (of others and herself), which contributed to interpersonal problems, depression, and anxiety.

7 Course of Treatment and Assessment of Progress

Intervention Plan

Table 2 summarizes important information about intervention implementation, including adherence, across 12 scheduled meetings. Because TOPPS is a prescribed intervention in which the provider is expected to follow specific instructions, intervention adherence was calculated as the number of protocol steps completed divided by the number of possible protocol steps, multiplied by 100 to obtain a percentage. Table 3 summarizes information about the intervention components implemented. Specific features of TOPPS components within the context of intervention implementation are reviewed when summarizing each of the three phases below. In TOPPS, the participant typically selects the order in which intervention components are implemented. However, the primary reason for conducting this study was to examine the efficacy of particular intervention components on specific outcomes that were elevated at pre-intervention assessment. Along these lines, safe sex was targeted in the first phase of intervention because Michelle was engaging in unprotected sexual activities, which increased her risk of HIV/STI and unplanned pregnancy. Dynamic Goals and Rewards was the primary intervention implemented to decrease frequency of unprotected sex (Program Orientation and Cultural Enlightenment were reviewed and goal development without reward contingencies was established during baseline). The second phase of intervention targeted binge drinking. Self-Control, Environmental Control, Goal Inspiration (Consequence Review), and other motivational interviewing techniques were implemented to decrease frequency of binge drinking. Poor teammate relationships were targeted in the third phase of intervention using communication skills training components (e.g., Reciprocity Awareness, Positive Request). The remaining intervention components were initiated across the 12 meetings based on Michelle's selection in intervention planning. Intervention implementation was usually successive and cumulative, thus after an intervention was implemented for the first time, it was subsequently implemented in the remaining meetings to a progressively lesser extent.

Study Design

In addition to the aforementioned comprehensive assessment battery that was administered 41 days before intervention implementation, and 8, 56, and 142 days after intervention completion (to assess changes in substance use, unprotected sex, sport performance, relationships, and mental health across this study), a multiple-baseline across behaviors experimental design was used to assess the effects of specific intervention components in decreasing Michelle's frequency of unprotected sex, binge drinking, and teammate relationships in a controlled context. Using

Table 2. Intervention Meeting Format and Adherence of Provider to Intervention.

Phase	Meeting	Time (min)	Intervention component	Protocol adherence %
Baseline	1	86	Agenda	100
			Cultural Enlightenment	92.9
			Program Orientation	100
1	2	90	SIC Goal Development	100
			Agenda	100
	3	50	Dynamic Goals and Rewards	90
			Agenda	100
			Dynamic Goals and Rewards	100
	4	59	Performance Planning	100
Agenda			100	
Dynamic Goals and Rewards			100	
2	5	65	Self-Control	86
			Agenda	100
			Dynamic Goals and Rewards	100
	6	60	Self-Control	100
			Goal Inspiration (Consequence Review)	96.4
			Agenda	100
	7	61	Dynamic Goals and Rewards	88.8
			Self-Control	87.5
			Agenda	100
	8	65	Dynamic Goals and Rewards	100
			Self-Control	70.8
			Financial Planning	95.8
9	64	Agenda	100	
		Dynamic Goals and Rewards	88.9	
		Financial Planning	100	
3	10	78	Environmental Control	83.3
			Agenda	100
			Dynamic Goals and Rewards	87.5
	11	60	Environmental Control	76.9
			Agenda	100
			Dynamic Goals and Rewards	87.5
12	74	Environmental Control	72.7	
		Reciprocity Awareness	93.3	
		Agenda	100	
		Dynamic Goals and Rewards	100	
		Reciprocity Awareness	80	
		Positive Request	85.4	
			Agenda	100
			Dynamic Goals and Rewards	100
			Reciprocity Awareness	100
			Positive Request	100
			Reciprocity Awareness	100
			Last Meeting Review	100

Note. Protocol adherence was calculated using the number of protocol steps completed divided by the number of possible protocol steps, multiplied by 100 to obtain a percentage. SIC = Sport Interference Checklist.

Table 3. Information About the Interventions Implemented.

Intervention	Times implemented	Total time (Min)	Average time (Min)	Average protocol adherence (%)	Average helpfulness ratings	Average compliance ratings
Agenda	12	28	2.3	100	N/A	N/A
Cultural Enlightenment	1	6	6	92.9	6	7
Program Orientation	1	11	11	100	7	7
Dynamic Goals and Rewards	12	334	27.8	95.2	7	7
Performance Planning	1	34	34	100	7	7
Self-Control	4	86	21.5	86.8	6.5	7
Goal Inspiration (Consequence Review)	1	18	18	96.4	7	7
Financial Planning	2	42	21	97.9	6	7
Environmental Control	3	52	17.3	77.6	7	7
Reciprocity Awareness	3	57	19	91.1	7	7
Positive Request	2	20	10	92.7	7	7
Last Meeting Review	1	30	30	100	7	7

Note. Helpfulness and compliance ratings were not obtained for Agenda. N/A = not applicable.

10-min probe assessments, these three behaviors were monitored immediately before each meeting throughout the study. The Dysfunctional Thoughts and Stress in training subscale was also administered at each probe assessment, but was not targeted directly with a TOPPS intervention component. It was predicted that each target behavior would improve, but only after it was targeted with intervention, and that dysfunctional thoughts and stress would progressively improve across the study.

Assessment of Intervention Format and Adherence of Provider

As shown in Table 2, Michelle completed 12 intervention meetings across three phases of intervention, with each meeting ranging from 50 to 90 min ($M = 67.67$, $SD = 11.9$). At least one significant other was present in all meetings, except for the first meeting to permit intervention goals to be derived privately. Michelle completed the program in 3 months, and was compliant and motivated throughout intervention. Protocol adherence across the 12 intervention meetings was 94.5% ($SD = 8.26\%$).

Baseline: Program Orientation, Cultural Enlightenment, and Goal Development

During Meeting 1, a standardized Program Orientation was conducted to provide an overview of the program, discuss expectations, and gather information regarding the referral. Cultural Enlightenment was subsequently implemented to build rapport, understand Michelle's cultural uniqueness, and determine the extent to which her ethnic culture should be addressed. Along this vein, she completed six questions that asked her to rate the extent to which she agreed or disagreed with various ethnic cultural experiences. She expressed that there were things she liked about her ethnic culture, did not feel it was a big part of her everyday life or important to her, did not experience rude or offensive remarks due to her ethnic background, and disagreed it should be addressed in the program because she felt disconnected from her ethnic culture.

Meeting 1 also involved reviewing pre-intervention assessment results for the SIC to identify Michelle's personal strengths and elevated goal-worthy items (in preparation of Dynamic Goals

and Rewards which establishes reward contingencies). Specific goals, and methods of accomplishing goals, were developed. Five elevated SIC items resulted in goals (i.e., maintaining focus on the task at hand, having positive thoughts about personal performance, effectively maintaining an optimum grade point average [GPA], being stress free, establishing optimum financial habits). Although several SARI Teammates items were elevated, assessment feedback and goal development for the SARI were intentionally skipped to avoid experimental contamination (because poor teammate relationships would be targeted in the third intervention phase).

Summary of baseline results. Figure 1 shows multiple-baseline data for unprotected sex, binge drinking, and poor teammate relationships across study weeks, with dysfunctional thoughts and stress in training plotted concurrently. As shown in Figure 1, Program Orientation, Cultural Enlightenment, and SIC goal development had no effect on unprotected sex, and a minimal improvement in teammate relationships. For binge drinking, Michelle reported an increase, which was unexpected, but may have occurred because alcohol avoidance was not discussed in Meeting 1. Thoughts and stress in training was not obtained during the first probe.

Phase 1: Effects of Dynamic Goals and Rewards on Outcomes

During Meeting 2, pre-intervention assessment results were reviewed for unprotected sex and alcohol (TLFB), and mental health (SCL-90-R and BDI-II). Michelle reported that she used condoms less than 20% of the time with her current partner, and that she was not ingesting hormonal birth control. Michelle indicated that she was not motivated to pursue birth control. She also believed that it was her partner's responsibility to ensure condom use during sexual intercourse. After discussing safe sex options, including the importance of contraception, Michelle established a goal to pursue birth control, and committed to discussing condom use in future intervention meetings. In terms of alcohol, Michelle stated that she previously drank 4 days per week, but had reduced her drinking within the past year. She reported that her tolerance for alcohol had increased, and would typically consume 12 drinks per occasion. Michelle indicated that she felt more mature about her alcohol use because she would only drink when she did not have any obligations the following day (e.g., class, practice). Although she acknowledged some negative consequences due to her drinking, Michelle was resistant to set goals specific to alcohol abstinence or avoidance, but did indicate she would be willing to address her alcohol use in later meetings. Mental health measures (SCL-90-R and BDI-II) were subsequently reviewed, and a goal of having realistic expectations of others was derived.

After goals and solutions were finalized, a family member joined the end of the second meeting and weekly contingencies were established for goal attainment. It was determined that Michelle would earn assistance with household chores, financial management for living expenses, and motivational statements to improve exercise adherence when 100% of her goals were accomplished and a commensurate percentage of these rewards for partial completion of her goals. Thus, the Dynamic Goals and Rewards intervention was initiated in the second meeting and was monitored weekly throughout intervention.

Performance Planning was initiated in the third meeting to determine Michelle's preferred interventions from a menu of options (see Table 3 for a list of available interventions). Michelle and her family member were solicited to provide input regarding how each intervention would be beneficial, and they ranked the components regarding their expected usefulness. Michelle prioritized Financial Management because she thought she was frivolous with money and Self-Control because she reported difficulties resisting social activities that conflicted with her responsibilities. Self-Control was selected for implementation in the fourth meeting to teach Michelle how to prioritize studying over social activities. Self-Control was also selected for implementation in the second phase of intervention to facilitate avoidance of binge drinking.

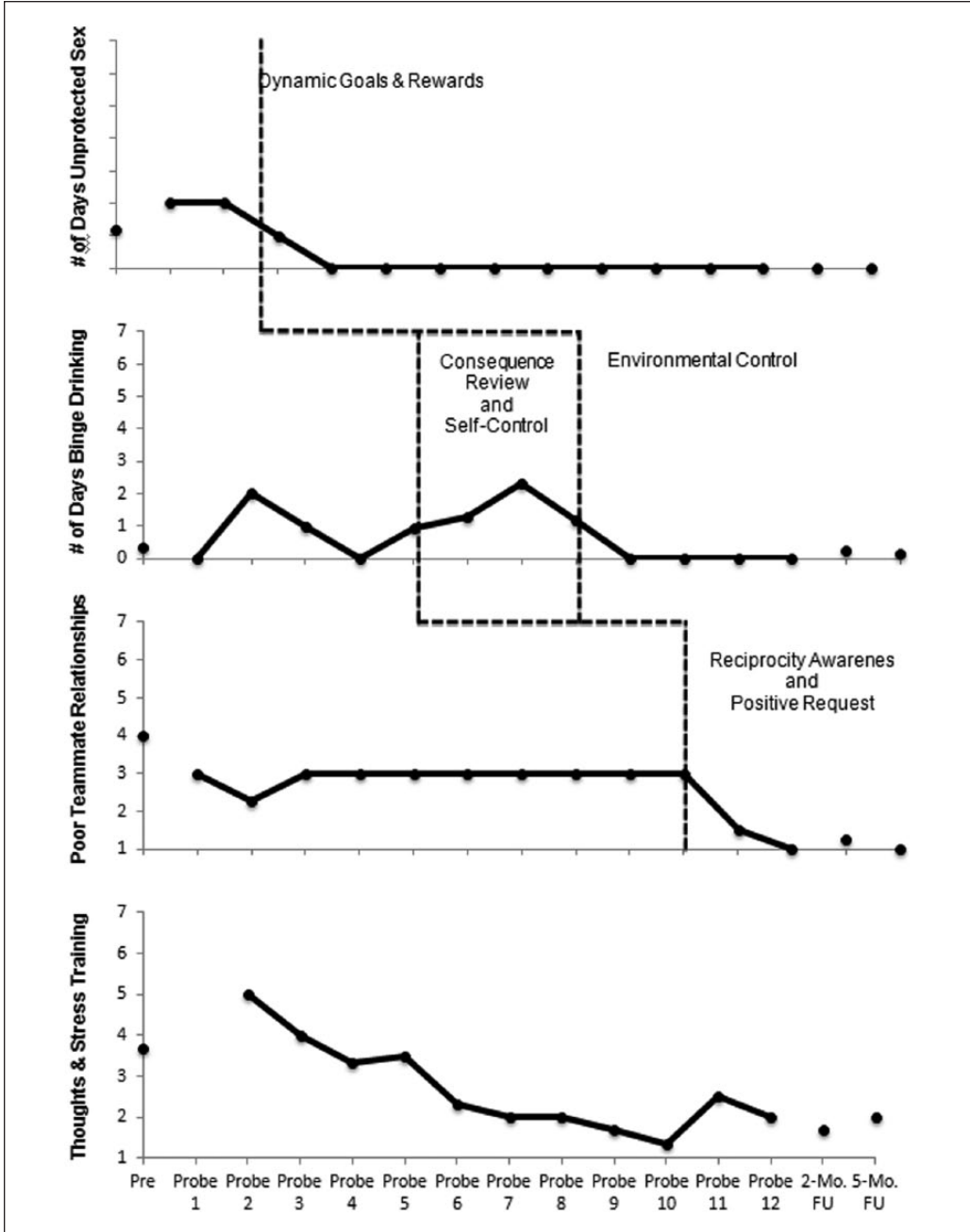


Figure 1. Multiple-baseline across behaviors results.

Note. Number of days of unprotected sex and binge drinking are represented as days per week (i.e., per 7 days). Probe assessments were administered immediately before each intervention meeting (e.g., Probe 2 preceded Meeting 2, thus effectiveness of intervention components implemented in Meeting 2 is assessed by Probe 3). FU = Follow-up.

Summary of Phase I results. A 3-week baseline was established for unprotected sex including the comprehensive pre-intervention assessment (see Figure 1) before implementation and examination of Dynamic Goals and Rewards. Prior to implementation, Michelle was having unprotected

sex twice per week. After Dynamic Goals and Rewards were initiated in Meeting 2, there was a noticeable drop in her having sex without a condom, including ongoing maintenance of a 100% reduction in unsafe sex to 0 days by the fourth probe. Interestingly, binge drinking and thoughts and stress in training revealed similar reductions from Probe 2 to 4 (the correlation between unprotected sex and binge drinking has been noted in previous studies). These behaviors slightly increased at Probe 5, whereas unprotected sex remained at 0. Dynamic Goals and Rewards had no effect on teammate relationships as expected.

Phase 2: Effects of Goal Inspiration (Consequence Review), Self-Control, and Environmental Control on Outcomes

Summary of interventions provided. Consistent with multiple-baseline methodology, the second phase of intervention (Meetings 5-9) continued to target unprotected sexual activity, while alcohol binge drinking was targeted for the first time. Dynamic Goals and Rewards facilitated discussion of unprotected sex and alcohol with family members present, including financial and emotional effects of pregnancy. During this phase, Michelle's family member disclosed that she disapproved of alcohol use, cautioned Michelle about the dangers of binge drinking, and reported support of safe sexual practices. Michelle was challenged by her performance coach to avoid binge drinking during a week she planned on "celebrating", and controlled drinking strategies were reviewed to assist goal achievement.

Goal Inspiration (Consequence Review) was implemented to help Michelle recognize negative consequences associated with her alcohol use. When initially asked to rate how unpleasant alcohol use was for her on a scale ranging from 0% (not unpleasant at all) to 100% (completely unpleasant, couldn't get any worse), Michelle reported an unpleasantness rating of 20%. She was subsequently prompted to list several things that were unpleasant, and she indicated poor nutrition and health, decreased endurance, her competitors gaining an advantage, and lack of productivity. Prompted with a list of potential negative consequences experienced by other student-athletes, Michelle reported that poor academic performance and disrespect from others were also adverse consequences associated with her drinking. After the performance coach provided empathy for her unpleasant experiences, she was again asked to rate how unpleasant alcohol use was for her utilizing the aforementioned scale (0% to 100%). She reported an unpleasantness rating of 40%, which was a 20% increase from the initial rating. Michelle explained that she provided a higher score the second time because she gained insight regarding the ill effects binge drinking has on her nutrition and athletic performance. She subsequently was prompted to identify several positive consequences of avoiding alcohol intoxication, and she indicated better fitness, balanced life, relationships with teammates, and long-term health.

Self-Control trials were utilized to target alcohol binge drinking throughout the second phase. In this intervention, she was taught a series of skills to recognize early signs of alcohol use and terminate urges utilizing thought stopping, diaphragmatic breathing and relaxation, brainstorming alternative actions, discussing pros and cons of solicited alternatives, and imagining implementation of chosen solutions and rewards for having chosen alternative actions. While soliciting helpfulness ratings, Michelle disclosed that when the intervention component was first introduced, she did not think it would be beneficial. However, after performing the Self-Control steps she reported that it was "very helpful." In brainstorming alternatives to binge drinking, Michelle consistently generated appropriate avoidance strategies. By the third time the intervention was implemented, Michelle had memorized the Self-Control steps and was role-playing the process without assistance.

In the Environmental Control intervention, Michelle developed a list of people, places, and activities that facilitated goal accomplishment, emphasizing stimuli that were incompatible with alcohol intoxication (e.g., family members, coaches, teammates, training, library, sufficient

sleeping, work, and relaxing activities). Michelle generated additional goal incompatible cues with her coach, including drinking, parties and fraternity/sorority events, social media, and staying out late. They also discussed prioritization of academic activities and team responsibilities instead of drinking activities, scheduling productive activities early in the morning, using self-control techniques, and spending time with teammates in social activities that do not involve alcohol. Her coach was asked about Michelle's strengths and contributions to the team, and Michelle was praised for her work ethic and leadership skills. Michelle was solicited about her aspirations for the upcoming season, and she expressed a desire to be a team leader, positive role model for her teammates, and improve her technical abilities. She was asked how her drinking behaviors were consistent with these aspirations, and Michelle acknowledged that her alcohol use may affect teammates' perceptions of her leadership skills, and that she had recently experienced decreased performance from drinking. Taking advantage of this "aha" moment, Michelle was challenged to avoid alcohol the upcoming week, and she willingly accepted.

Summary of Phase 2 results. Throughout the second phase, Michelle did not engage in unprotected sex. Implementing Goal Inspiration (Consequence Review) and Self-Control targeting alcohol use in the second intervention phase did not result in less binge drinking initially. However, the performance coach's challenge to avoid alcohol binge drinking during the week of a celebratory event may have curtailed Michelle's alcohol use during this week. Following the third implementation of Self-Control, Michelle's binge drinking reduced by 50%, and a further reduction to 0 binge drinking days per week was observed after Environmental Control was initiated. As hypothesized, teammate relationships remained at 3 throughout the entire second phase, suggesting that decreased alcohol binge drinking was influenced by intervention. Dysfunctional thoughts and stress was slightly reduced throughout the second phase.

Phase 3: Effects of Communication Skills Training on Outcomes

Summary of interventions provided. The third phase of intervention (Meetings 10-12) focused on improving relationships while avoiding unsafe sex and binge drinking. Dynamic Goals and Rewards and Reciprocity Awareness were implemented in all meetings, and Positive Request was implemented in the final two meetings. During the last meeting, a review of TOPPS was facilitated by the performance coach to reflect on Michelle's progress and accomplishments throughout intervention.

During Dynamic Goals and Rewards, Michelle mentioned that she had a poor relationship with one teammate due to this person's non-attendance at team-oriented events and "negative attitude." Therefore, coaches and teammates attended Phase 3 meetings instead of family members to assist in the enhancement of this relationship.

Reciprocity Awareness was implemented to further enhance relationships between Michelle and her significant others. They were prompted by the performance coach to exchange things they "loved, admired, and respected" about each other. Michelle primarily acknowledged their team-oriented qualities, including their confidence and energy. Her significant others reciprocated by recognizing Michelle's personal qualities including her work ethic. For homework, Michelle was assigned to provide at least one appreciation statement to each supportive other, which assisted positive interaction with the teammate for which difficulties were previously evidenced. Indeed, Michelle reported that as intervention implementation progressed, her relationship with this person improved.

The Positive Request intervention was utilized to teach Michelle how to make requests of others while avoiding arguments (e.g., succinct requests for specific actions, when actions are desired, offers to assist, statements of appreciation, acceptable alternatives). Michelle participated in role-playing scenarios with her coach and teammates. One of her requests involved successfully asking teammates to enhance positive focus.

Summary of Phase 3 results. During the third phase, communication skills training resulted in a steady improvement in teammate relationships while unsafe sex and binge drinking maintained at 0. Dysfunctional Thoughts and Stress in training elevated slightly, albeit these scores were not clinically concerning. This slight elevation may have resulted from increased stress associated with her successful attempts to enhance the relationships with her teammates.

8 Complicating Factors

Michelle initiated intervention with a high level of motivation to improve her academics, sport performance, and relationships. However, she initially lacked motivation to avoid alcohol use and unprotected sex. Much of Michelle's intervention occurred during the off-season when student-athletes are more likely to have increased drinking, and an important celebratory event occurred during the second phase of intervention when binge drinking was being targeted for the first time. To enhance her motivation, the performance coach strongly encouraged her to involve her family and coach in performance meetings. Although she was initially resistant to the inclusion of her family and coach in her intervention plan, she later acknowledged their importance in her ability to achieve extended sobriety and safe sexual activity.

9 Access and Barriers to Care

Michelle was a student-athlete who was currently enrolled at the university where the intervention program was located. Her significant others resided close to campus and were able to regularly attend meetings. Thus, the college campus appeared to facilitate access to care.

10 Follow-Up

Post-Intervention Results

All post-intervention TLFB measures of illicit drug use were 0. However, hair follicle results for methamphetamines were positive for ecstasy (MDMA). Michelle was queried about the positive test result, and disclosed that she used ecstasy 1 month prior to post-assessment.

SIC post-assessment results revealed greater than 50% reductions in Dysfunctional Thoughts and Stress (50.14%) and Academic Problems (50.19%) during training, and Dysfunctional Thoughts and Stress (53.43%), Academic and Adjustment Problems (55.67%), and Overly Confident and Critical (66.67%) during competition. SARI relationship problems with family, coaches, and peers remained low. Consistent with multiple-baseline results, decreases in several SARI Teammates subscales were observed, including Poor Relationship and Lack of Support (66.67%), Not a Team Player and Too Non-competitive (66.67%), and Poor Relationship (75%). Significant *T* score decreases were determined for Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Psychoticism, and Global Severity Index. In addition, BDI-II Total went from 13 to 0.

Follow-Up Assessment Results

Binge drinking was 1.07 days per month at Follow-up 1 (i.e., 2-month follow-up) and 0.70 days per month at Follow-up 2 (i.e., 5-month follow-up), a 28.19% and 53.02% reduction from baseline, respectively. This corresponded to 0.25 days per week and 0.16 days per week for binge drinking (see Figure 1). Marijuana use and unprotected sex (see Figure 1) were not reported at either follow-up. Michelle reported 0 days of hard drugs at Follow-up 1, which was confirmed by negative urinalysis and hair follicle results. She also reported 0 days of hard drugs at Follow-up

Table 4. Consumer Satisfaction.

Variable	Score
Client satisfaction questionnaire total	4
Performance coach evaluation	
How helpful was your performance coach throughout the program?	7
How skilled was your performance coach throughout the program?	7
How comfortable were you with your performance coach throughout the program?	6
How effective was the program in meeting your needs?	6
Perceived successfulness of TOPPS	
To what extent was the program successful in reducing your risk for HIV and other sexually transmitted infections?	4
To what extent was the program successful in reducing your substance use?	6
To what extent was the program useful in improving your sport performance?	6
To what extent was the program useful in improving your relationships with coaches, teammates, peers, and family?	6
To what extent was the program useful in improving your general mental health?	6

Note. Client Satisfaction Questionnaire Total scores range from 1 to 4, with higher scores reflecting greater satisfaction with the program. Performance Coach Evaluation items range from 1 to 7, with higher scores reflecting greater helpfulness, skill, comfort, and program effectiveness. Perceived successfulness of TOPPS scores ranges from 1 to 7, with higher scores reflecting greater success in the five aims of the study. TOPPS = The Optimum Performance Program in Sports.

2. However, urinalysis results for amphetamines were positive. Michelle was later queried about this positive result, and she denied using amphetamines.

Results for SIC, SARI, and BDI-II Total were essentially maintained at follow-up. The target areas of the multiple-baseline, Poor Teammate Relationships (SARI), and Dysfunctional Thoughts and Stress during training (SIC) remained low during both follow-up assessments (see Figure 1). Similarly, results for SCL-90-R subscales were maintained, with further reductions in Somatization, Depression, and Global Severity Index from post-intervention assessment.

Consumer satisfaction assessed at Follow-up 2 is presented in Table 4. Michelle reported a high level of satisfaction with the program and believed that her performance coach was generally comfortable to talk to, helpful, and skilled. She also indicated that the program was successful in reducing HIV/STI risk and substance use, and improving her sport performance, relationships, and mental health.

II Treatment Implications of the Case

This case study permitted an evaluation of the effectiveness of a sport-specific Family Behavior Therapy (FBT) with a collegiate athlete diagnosed with lifetime alcohol abuse. Multiple-baseline results revealed substantial reductions in problem behaviors after being targeted with specific intervention components. Initiating Dynamic Goals and Rewards was associated with a substantial decrease in unprotected sex, and through continued implementation, Michelle abstained from unprotected sex for 9 consecutive weeks. Consistent with prior research (Chernoff & Davison, 2005), this finding suggests that setting, monitoring, evaluating, and rewarding safe sex goals (e.g., condom use, birth control, one monogamous partner, regular testing) may be sufficient in reducing HIV/STI risk behavior. Relevant to alcohol use, successive implementation of Self-Control reduced Michelle's frequency of binge drinking, while Environmental Control resulted in 4 consecutive weeks of alcohol avoidance. It is unknown whether Michelle would have eventually abstained from alcohol had Self-Control been the only intervention targeting binge

drinking. However, exploring discrepancy through motivational enhancement techniques appeared to be instrumental in helping Michelle understand how her drinking behaviors were inconsistent with her athletic performance and team aspirations. Environmental Control helped Michelle recognize how people, places, and activities contributed to her alcohol use both positively and negatively. Results also demonstrated that teammate relationships may be improved with Reciprocity Awareness and Positive Request. A primary reason for this reduction was likely because the teammate that Michelle was experiencing problems with was directly involved in the intervention process, and homework assignments were designed to enhance their relationship through positive communication exchange. Although not targeted with specific interventions, Michelle reported less dysfunctional thoughts and stress, academic and adjustment problems, and overconfidence from pre- to post-intervention assessment, and these gains were maintained at follow-up assessment. Similar reductions were observed for mental health. Michelle was in the 84th percentile for symptoms of somatization, obsessive-compulsive, interpersonal sensitivity, depression, psychoticism, and global severity at pre-assessment, but dropped below the 50th percentile at post- and follow-up assessment.

12 Recommendations to Clinicians and Students

This case study describes a comprehensive approach to intervention with a collegiate student-athlete utilizing an evidenced-based intervention and integrating empirical research findings. Although Michelle was initially resistant to change her drinking behaviors, motivating factors unique to her athletic status were integrated into intervention planning, such as her sport performance and involvement of her coach (Martens et al., 2006; Nelson & Wechsler, 2001). Systematically involving her head coach not only decreased Michelle's binge drinking but also improved her relationships with teammates. Although results of this case trial were generally positive, biological measures suggest that Michelle used at least one stimulant drug during follow-up. Indeed, given her high expectations, self-criticism, and difficulties maintaining high grades while balancing a busy college life, Michelle may have used stimulant drugs as a coping strategy. Therefore, it may be important to administer biological drug screening measures throughout intervention in future outcome studies involving athletes to increase drug testing sensitivity.

In summary, this case study supports the efficacy of a sport-specific adaptation of FBT in concurrently decreasing HIV/STI risk and substance use while enhancing relationships, sport performance, and mental health. Therefore, given the absence of evidence-based interventions to assist athletes in the aforementioned target areas, TOPPS offers a viable alternative to non-evidence supported traditional campus counseling programs.

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