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A Pre-Test Post-Test Tool Development and Evaluation for the Abstinence-Plus Curriculum "Against The Tide"

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A PRE-TEST POST-TEST TOOL DEVELOPMENT AND EVALUATION FOR THE ABSTINENCE-PLUS CURRICULUM "AGAINST THE TIDE"

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Abstract

Problem and Significance: Adolescents in the U.S. are subjected to multiple media messages, peer influence, and cultural acceptance of sexual activity that result in one of the highest rates of teen pregnancy, teen abortion, and sexually transmitted disease among all developed nations. Varying educational curriculums have been studied regarding their effectiveness in decreasing these negative societal issues with our youth. The Women's Pregnancy Center within Peoria Rescue Ministries has been administering abstinence-plus sex education curriculum, Against the Tide (ATT), to various school systems for the past 15 years. However, the effectiveness of the ATT curriculum had not been measured.

Purpose: To develop a reliable and valid pre- and post-test assessment tool to be used with the ATT program.

Theoretical Model: This 11-item instrument was initially development by the nurses who teach the ATT curriculum as guided by concepts found in the Transtheoretical Model.

Methods: The 11-item instrument was administered to all students who participated in the ATT program in Fall 2014. The ATT staff randomly selected the surveys from 300 of the participants for analysis. Out of these 300 surveyed, only 286 participants had complete pre- and post-test surveys, resulting in a final N=286.

Results: Principle components analysis revealed two factors in the survey. Based on the analysis, only seven of the 11 items were recommended to be retained in the survey. Cronbach's alpha for the 7-item instrument was .58, and the readability was found to be grade-level appropriate for 5 out of final seven questions. While determining pre- and

post-test differences was not the primary purpose of this study, a t-test was used to determine differences between the pre- and post-test scores, and was found to be significant.

Conclusions: Once outcomes of reliability and validity are supported, this 7-item likert scale could be considered reliable for future study when applied to measure the efficacy of the ATT curriculum.

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Acknowledgments

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I could not have completed this project without the help of Dr. Sharon Christman and Dr. Randall Johnson. The guidance, expertise, and grace they bestowed to me enabled this project to happen.

Dedication

I dedicate this work to my sons, Billy and Charlie. Their love and patience inspire me, and have been true gifts through this experience. Aside from the Lord, they are the motivation behind my effort.

Introduction and Literature Review

The early onset of sexual activity for teenagers, including risk-taking behaviors, has become a prevalent problem in our culture today. The consequences are manifold to our society, and there are also a multitude of factors that contribute to this problem. Some of these factors that contribute are the onset of puberty, basic desire for intimacy, family dynamics and values, popular culture, media, increased freedom from restriction, and decreased exposure in public forums to faith and spirituality (McNeely & Blanchard, 2009). The consequences are devastating and life altering for both teens and our culture alike: physically, mentally, emotionally, spiritually, and financially. Parents, along with the teaching and leadership of school nurses, health practitioners, and churches, have a great responsibility to prepare and guide our growing children towards making positive decisions about their sexual choices.

The negative consequences for teens with early onset sexual behavior have been reported within the statistics of teen births, abortions, and sexually transmitted diseases (STDs). In 2011, the birthrate for adolescent girls ages 15 through 19 in the United States was 31.3 births per 1000 (CDC, 2013). While this rate has decreased almost 25% since the 2007 rate of 41 births per 1000 girls, it still translates to almost one out of every forty adolescent girls giving birth between the ages of 15 and 19. In 2010, CDC statistics showed that adolescents aged 15 to 19 years old accounted for 14.6% of all abortions, with an abortion rate of 11.7 abortions per 1,000 adolescent girls. According to previous year's statistics from the CDC, the adolescent abortion rate has also decreased, however, unwanted pregnancy and the termination of those pregnancies, in any number is undesirable. In their statistical report of STDs, the CDC (2013) reported that adolescents

ages 15 through 19 account for nearly half of the 20 million new cases of STD's each year, and this rate continues to rise. Despite some of the improvements in rates over the past ten years, there is still a large need for improving and refining the sex education curriculums that are being presented.

There are two different philosophies that underpin adolescent sex education. The first school of thought is *abstinence-only* education, which stresses that abstinence should be the only choice until marriage, and provides minimal to no contraception information (Santelli, Ott, Lyon, Rogers, & Summers, 2006). The second method is *comprehensive* sex education, which includes information about both abstinence and contraception (Jeffries, Dodge, Bandiera, and Reece, 2010; Doskoch, 2012).

There is much literature surrounding the debate between *abstinence-only* curricula and c*omprehensive* sex education. In 1996, the passage of Title V of the Social Security Act mandated that the U.S. government fund state-level abstinence-only-until-marriage education (AOUM) in public schools (Jeffries et al., 2010). Since then, abstinence-only curricula have shown to have little efficacy on adolescents' sexual behaviors, specifically to decreasing or preventing pregnancy and STDs, despite significant policy and funding efforts (CDC, 2009; Kirby, 2007; Underhill, Operario, & Montgomery, 2007; Doskoch, 2011). On the contrary, there is more evidence to support the efficacy of comprehensive sex education (CDC, 2009; Kirby, 2007; Underhill, et al., 2007; Doskoch, 2011). Therefore, in the last five years there has been a move in curriculum reform toward comprehensive sex education, called *abstinence-plus*, being provided to adolescents directed at promoting healthier sexual decisions in our youth (Santelli, 2008). Since beginning this shift in 2006, 21 states have mandated that the medical and scientific

accuracy of various contraception methods be included in the provision of sexuality and HIV/AIDS education (Santelli, 2008).

The information regarding sexual health that is given to adolescents within their families and cultures is varied. The task at hand for school nurses and family health practitioners is to provide a scientific, factual, and realistic set of information that will often need to supplement or counteract the input adolescents are receiving from other sources. There are many options for sex education curricula available, and curriculum reform for sexual education content is ongoing and vitally important.

Program and Study Description

Peoria Rescue Ministries (PRM) is a Christian-based organization in Illinois, funded fully by private donations, that includes services that provide support and resources to pregnant women. The Women's Pregnancy Center, a division of the rescue mission, is a pro-life ministry existing to provide educational information and compassionate support. As part of their free services to the community, they developed and provide an *abstinence-plus* curriculum called *Against the Tide* (ATT) to approximately 1500 Peoria pre-teens and teens each year. As part of their mission, the educators provide medically accurate sex education, while remaining firmly rooted in their faith-belief system. All students are made aware of the programs' presuppositions at the start of educational onset. The ATT mission statement is "to provide research-based, medically accurate, holistically-focused information in order to empower students to understand their ability to develop and achieve risk-free, regret-free sex, sexuality, and healthy relationships." (PRM, 2014).

The Program goals include helping students to:

- Explore values and attitudes regarding sex/sexuality
- Understand types of sexual behavior/risks, and that abstinence is the best way to prevent those risks
- Identify and explain STDs
- Recognize protective options, including abstinence and contraception
- Identify the importance of healthy interpersonal relationships
- Recognize the characteristics of healthy vs. unhealthy relationships

This study was done as a partnership with the ATT staff to assist in the development of a measurement tool to assess the effectiveness of the ATT curriculum. The ATT educators expressed the desired outcomes of the ATT curriculum as 1) students' increased knowledge, and 2) students' intention to change behaviors. The educators hoped to see that a knowledge increase would lead to positive change in attitudes regarding sex, and positive health behaviors, as measured by the survey.

During the research planning stage, the primary investigator worked with the ATT educators to modify their current assessment tool to better measure the student's progression toward the desired outcomes. The ATT assessment tool was developed based on the *Big Decisions* assessment tool. *Big Decisions* is a ten-week *abstinence-plus* curriculum used in Texas. In 2009, Davis reviewed the *Big Decisions* curriculum and identified its strengths, which were consistent messages that having sex is a big decision, abstinence as the healthiest choice, consistent and correct condom use with sexually active teens, and testing for sexually transmitted diseases. A qualitative analysis of the

Big Decisions curriculum reported qualitative themes that would provide guidance for further program planning (Smith, Realini, Buzi, and Martinez, 2011).

In another study of the *Big Decisions* curriculum, a pre- and post-test survey was used to measure changes in attitudes, self-efficacy, and behavioral intentions in 788 inner-city 9th-grade students, the majority of which (78.4%) were Hispanic (Realini, Buzi, Smith, and Martinez, 2010). Results of their *t*-test analysis indicated statistically significant differences from pre- to post-test for 11 of the 12 items (Realini et al., 2010). Notably, the largest change was in the attitude toward abstinence, for both male and female participants. Based on these results, the researchers suggested that participation in the *Big Decisions* program was associated with positive changes in student attitudes, and could provide an effective approach to *abstinence-plus* messages.

Neither research study mentioned the evaluative tools having been measured for reliability or validity, nor was readability testing of the assessment tool found. A gap in the literature is noted in that no studies were found regarding sex education curricula, its instrument design, subsequent reliability and validity testing of the instrument, or the outcome measures.

Theoretical Framework

Health behaviors and choices of patients have become a central theme within health care reform in the United States (Fullerton & McCullough, 2014). Disease prevention and health promotion are heard often in discussions regarding how we can decrease costs and increase effectiveness of interventions, with the goal of improving outcomes with fewer resources. Butts and Rich (2011, p. 247) stated, "Health behavior is central to disease prevention and management." Nurses, educators, and health care professionals are all stake-holders in the campaign to educate health care consumers about making healthy choices, which would create healthier communities.

Education curricula intended for healthy behavioral decisions is more effective when based on known theoretical models. In the U.S. National Campaign to Prevent Teen Pregnancy, Douglas Kirby, a senior research scientist, explained one of the ten components of effective sexual education curricula is a theoretical base (Kirby, 2001). In his 2007 revision of the National Campaign, he again revisited that an effective curriculum must involve multiple people with expertise in theory (Kirby, 2007).

Theories regarding health behaviors are widely used to guide and define the scope of practice within the social and health sciences. Theories and models help explain behavior, as well as provide a guide for which more effective ways to change behaviors can be developed. In keeping with evidenced based practice and their guidelines, health behavior theories give perspective to the application of newer health interventions and education (Butts & Rich, 2011).

The ATT staff drew upon the behavior change theory the *Transtheoretical Model* to guide measurement tool development (see Figure 1). The major construct of the

Transtheoretical Model (TTM) is the *stages of change*, which is a circular construct hypothesizing that health behaviors change as a person passes through the various *stages of readiness*. The TTM proposes that the success of any intervention relies upon the *stage* in which a person is. This theoretical model has demonstrated effectiveness in explaining health behavior changes in a variety of areas, including smoking cessation, medication adherence, and risk-taking behaviors, and helps explain and predict when behavior change is likely to take place (Norcross, Krebs, & Prochaska, 2011; Butts & Rich, 2011; Velicer et.al., 2000).

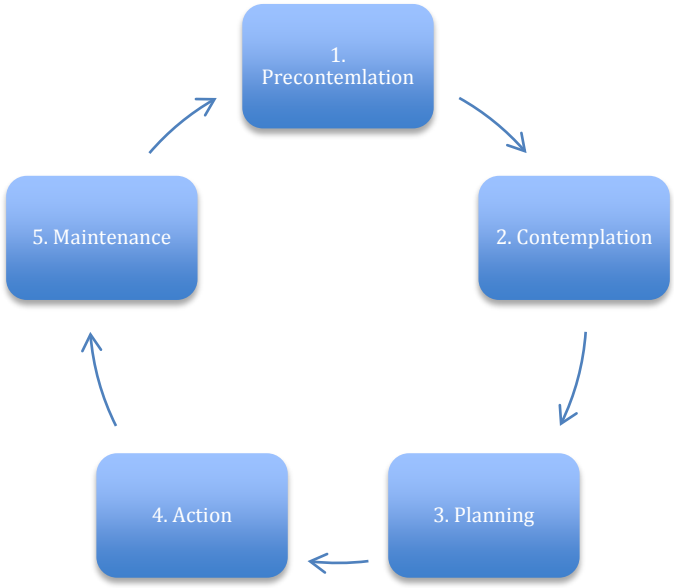

Figure 1. Stages of Change

The Transtheoretical Model describes a sequence of readiness for successful behavior change in five steps (Butts and Rich, 2011):

1. Pre-contemplation~ No recognition of need for or interest in change,
2. Contemplation~ Thinking about changing,

3. Preparation~ Planning for change,
4. Action~ Adopting new habits, and
5. Maintenance~ Ongoing practice of new, healthier behavior.

These five stages represent a temporal predictor of when people will change an aspect of behavior. The stages are not always experienced in a linear manner, and often will be recycled and repeated, depending on circumstance and motivation (Norcross, Krebs, & Prochaska, 2011).

For the purposes of the evaluation of the ATT program, the stages within the theory that were evaluated were precontemplation, contemplation, and preparation for change. We chose not to assess for action and maintenance stages due to lack of study longevity.

According to the TTM, within each *stage of change* a person can be motivated, or helped, to move to the next stage through the use of *processes of change* (POC). Processes of change are concepts explaining how the change behavior is achieved. Processes of change have been found to be useful in explaining *when* changes in cognition, emotion, and behavior take place, and help to explain *how* these changes occur (Norcross, Krebs, & Prochaska, 2011). Theoretically the POCs need to be implemented to successfully progress through the stages of change and attain the desired behavioral change. These ten processes are divided into two groups of five concepts, the first being cognitive and affective experiential processes, and the second being behavioral processes. The experiential processes are usually used for the early stages of transition, and the behavioral processes are used primarily for later stages of behavior transition (Velicer et.al., 2000). The ten Processes for Change are as follows:

Experiential Processes:

- **Consciousness raising** – Knowledge and awareness about the individual's problem behavior is increased.
- **Dramatic relief** – Emotions about the individual's problem behavior, and available treatments or solutions, are aroused.
- **Environmental reevaluation** – The impact that the individual's problem behavior has on their environment is reassessed.
- **Self-reevaluation** – Cognitions and emotions regarding the individual, especially with respect to their problem behavior, are reassessed.
- **Social liberation** – Attempts are made to decrease the prevalence of the individual's former problem behavior in society.

Behavioral Processes:

- **Reinforcement management** – Positive behavioral changes are rewarded.
- **Helping relationships** – Trusting and open discussion about the problem behavior is received by a supporting individual(s).
- **Counterconditioning –** Positive alternative behaviors are substituted for the individual's problem behavior.
- **Stimulus control** – Stimuli that may trigger lapse back to the problem behavior are prepared to be coped with, removed, or avoided.
- **Self-liberation** – Choosing a course of action to change the problem behavior, and committing to that choice. (Velicer et al., 2000)

These two groups of processes were utilized in our analysis of each of the 11 items on the measurement tool. The individual items on the instrument were categorized as to which specific *process* they were measuring, to ensure validity. This was done using a statistical technique called Principle Component Analysis (PCA), which will be explained further in the Methods discussion.

Additionally, in order to incorporate the fundamentals of the Transtheoretical model, one "stage of change" question was added to determine the stage students were in regarding abstinence and sexual activity. The concept measured was labeled 'stage of change', and was conceptually defined as the students' reported stage of precontemplation, contemplation, and preparation. Operationally, a student in the precontemplation stage reported no need for change in sexual health habits, or no interest in changing sexual habits. A student in the contemplation stage reported thinking about positively changing sexual health habits. Students in the preparation stage reported planning to positively change sexual behaviors, or report an operational plan to change.

Hypotheses:

1. The Principle Components Analysis will reveal at least two major concepts within the questionnaire.
2. Cronbach's alpha for the ATT questionnaire will be at 0.70 or higher.
3. The readability of the ATT instrument will be appropriate for age and grade-level.
4. There will be a significant difference between the pre and post test scores on the ATT before and after the ATT intervention.

Methods

Design

This was a descriptive study to determine the reliability and validity of the ATT instrument.

Subjects and Data Collection

Peoria educators chose 300 random questionnaires from anonymous participants. Fourteen surveys were incomplete, missing more than half or all data, reducing the applicable data to 286 (N=286). All of the 286 surveys completed included before- and after-intervention data.

Instrument

The 11 items on this questionnaire were measured using a 4-point Likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree) (Appendix A). Each item was treated as an interval level of measurement.

Data Analysis

Reliability of the ATT assessment tool was tested for the internal consistency of the items on the tool, to verify they were measuring the variables consistently. The reliability was tested using the Cronbach's alpha (*r*), which is commonly used on multi-item scales such as the Likert scale used (Grove, 2007). A Cronbach's alpha coefficient of 0.80 is considered the lowest acceptable score for an established measurement tool, whereas a value of 0.70 could be found acceptable for a new tool (Grove, 2007).

For this study, Principle Components Analysis (PCA) was used to determine the most meaningful variance in the data. PCA is widely viewed as valuable in newer test development, where multiple variables could potentially be present, and developers are

not certain if all are pertinent to the validity of the instrument (Jolliffe, 2014). PCA is similar to factor analysis, yet distinct in that it is generally used for data reduction, and reduces variables into the two or three most meaningful to the instrument.

Readability of the assessment tool was tested through readability formulas (Grove, 2007), as an important element adding to the reliability and validity of the instrument. Readability can be tested with simple formulas, which are used extensively within the fields of education and literature, using the Flesch-Kincaid readability tests. These tests consist of two separate measurements, the Flesch-Kincaid (F-K) Grade Level, and the Flesch Reading Ease components, which have similar core measures, but measure inversely related concepts. Using word and sentence length, and syllabic measures, the two formulas test the grade level and the 'reading ease' for many purposes, which include the U.S. Government Defense Department and Microsoft Office (Readability Formulas, 2015). The standard readability ease score is recommended to fall between the values of 60.0 to 70.0, in order to be easily understood by 8^{th} and 9^{th} graders, whereas scores between 90.0 and 100.0 are understood by an average 5^{th} grader, and scores between 0.0 and 30.0 by university graduates (Readability Formulas, 2015).

Ethical Considerations

Prior to the data analysis, permission from Peoria Rescue Ministries and the ATT educators was obtained, IRB approval from Cedarville University was obtained, and subjects received the usual participatory introduction letter, which explained the program to families and students, assured confidentiality, and stated that participation was voluntary and any participant could withdraw at any time. The data collection took place

during the fall of school year of 2014, and analysis phase of the project was complete during Spring 2015.

Results

Demographics

The final sample consisted of 286 students (n=286). Demographic statistics revealed data regarding gender, race, and age. The sample was split evenly between male and female, about 60% of students were white, 20% were black, the mean age was 14.4 years, and most of the students were in seventh and eighth grades (see Table 1).

Gender	55 % male 45 % female
Age	Mean 14.4 +/- SD
Ethnicity	18.9 % Black 60.5 % White 5.6 % Hispanic 2.8 % Asian 6.1 % Other
Grade level	48 % 7 41 % 8 11 % 9

Table 1. Demographics

Hypothesis 1: The Principle Components Analysis will reveal at least two concepts within the questionnaire.

The scree plot retrieved from the Principle Components Analysis (PCA) revealed a vector with two meaningful Eigenvalues, as represented by the bend in the vector (see Figure 2). A third component was close in value, however was not included in our PCA final data set. The Kaiser-Meyer-Olkin test was utilized within the PCA statistical analysis, and revealed a sample size adequacy measure of .698, where values of .4 or greater indicate adequate sample size for the PCA (see Table 2).

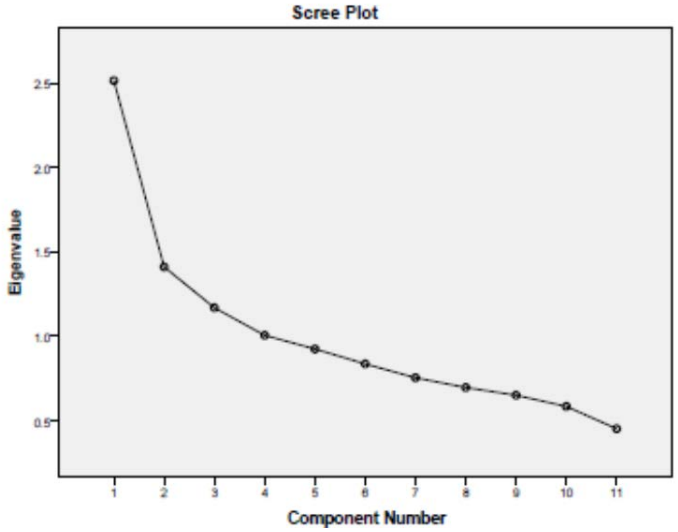

Figure 2. Scree Plot for Principle Component Analysis

KMO measure of sample adequacy	.698

Table 2. Kaiser-Meyer-Olkin Test

The Principle Components Analysis revealed at least two meaningful and measureable components within our data set (see Table 3). The first component within

the PCA was titled ‘Experiential’, and data values above .5 were considered to contribute meaningfully to that concept measurement. The Experiential concept questions included Questions 3, 5, 7, 9, and 10. The second component was titled ‘Behavioral’, and two questions scored values above .5 for this concept, which were Questions 6 and 8. Four questions did not score above a .5 to significantly measure either of the two concepts, which were Questions 1, 2, 4, and 11. These items were not included in the Cronbach’s Alpha computations for reliability.

Question number	Component 1 experiential	Component 2 Behavioral
Q5	.654*	-.137
Q9	.596*	.420
Q3	.579*	-.190
Q7	.545*	-.017
Q10	.510*	.386
Q4	.499	-.043
Q2	.415	.019
Q8	-.131	.667*
Q6	.071	.663*
Q11	-.355	-.435
Q1	-.145	.396

Table 3. Principle Component Analysis-Eigenvalues

Hypothesis 2: Cronbach's alpha for the ATT questionnaire will be at 0.70 or higher

The Cronbach's Alpha score for the 5-item experiential component, was .609; for the 2-item behavioral component it was .366; for the entire 7-item instrument it was .578. (see Table 4).

Component	Items	Cronbach's Alpha
Experiential	3, 5, 7, 9, 10	.609
Behavioral	6, 8	.366
All items		.578

Table 4. Cronbach's Alpha Results

Hypothesis 3: The readability of the ATT instrument will be appropriate for age and grade-level.

When readability was tested, 5 out of the 11 questions fell into acceptable reading parameters for this age group. The acceptable readability applied to questions 2, 7, 8, 10, and 11. The other 6 questions, 1, 3, 4, 5, 6, and 9, scored lower than the 60.0-70.0 range for reading ease, which makes them more applicable to grade levels 12 and higher (see Table 5).

Question	Reading Ease	Grade Level
Unplanned pregnancy and sexually transmitted diseases are only two of the negative consequences of sex outside marriage.	25.4	16.2
Hormones are not the biggest factor influencing teens to have sex.	72.6*	8.2**
Using a condom correctly every time you have sexual contact will prevent pregnancy and sexually transmitted diseases 100% of the time.	28.4	15.3
Some sexually transmitted diseases can be transmitted through genital skin-to-skin contact.	37.5	14.6
It is possible to have a sexually transmitted disease without any symptoms.	32.5	12.2
If I engage in any type of sexual contact, including oral sex, anal sex, and genital skin-to-skin contact, I will get tested for sexually transmitted diseases.	39.4	14.1
If I decide to have sex before I'm ready to have a child, I plan to use some form of birth control.	87.9*	5.3**
I plan to wait for sex until I am married.	95.2*	2.0**
It is possible to set physical and sexual boundaries with my dating partner.	44.0	12.0
I believe sex has the power to create life, change life, and end life.	95.9*	4.3**
I don't think I need to change anything about my sexual health choices.	77.8*	7.7**

* indicates a ‘standard’ or above Readability Ease

** indicates an appropriate Grade Level

Table 5. Readability Results

Hypothesis 4: There will be a significant difference between the pre and post test scores on the ATT measurement tool before and after the ATT intervention.

A *t*-test was run to determine differences between the pretest and posttest (See Table 6). From pre- to post-test mean sum scores for both components moved in the desired direction, indicating statistically significant differences between pre-test to post-test for the 7 items included in the data analysis (Behavioral p=<.002; Experiential p=<.000). The *behavior sum* values ranged from 0-8, based on 2 items on a 4-point scale, while the *experiential sum* values range from 0-20 based on 5 items on a 4-point scale. The mean sum score for all seven questions increased from 16.1 to 17.4 ($p < .001$).

Component	PrePost	N	Mean	Sig. (2-tailed)
Behavior sum	Pretest	277	5.8736	.002*
	Posttest	247	6.2551	.002*
Experiential sum	Pretest	268	16.1381	.000*
	Posttest	244	17.4303	.000*

*indicates significance at *p*<.01

Table 6. Pre and Post Intervention differences

Discussion

The purpose of this study was to determine the reliability and validity of the assessment tool developed for the ATT curriculum. The results of this study can be interpreted as moderate reliability for the *experiential* subscale (r = .609) and weak reliability for the 2-item *behavior* subscale (r = .366). Both subscales tested less than the recommended Cronbach alpha value for a new tool of r = .70. The behavior subscale may have tested with a lower reliability due to the low number of items in the scale. We believe that further revision of these questions for content and readability could improve the reliability, as well as adding one or two additional questions to this subscale.

Narrowing down the measurable concepts of the tool was achieved through the Principle Components Analysis (PCA). As mentioned previously, PCA is a valuable data reduction method for the development of newer tools, where large amounts of data are present, yet not necessarily meaningful, to the tool. This is pertinent to the reliability and validity testing in determining what components will be examined in a new tool, how they are grouped, and points to stronger validity of the items.

The Scree plot is the outcome of the PCA, and shows the eigenvalues on a vector line plot, as shown in Figure 2. The bends in the vector show the variables with the most amount of variance in the data, and pertain to the components that we actually want to measure in the internal reliability of the tool (Jolliffe, 2014). Additionally, Table 3 shows output for the PCA, with eigenvalues for each question. According to multiple sources, the common rule of thumb is values of .3 or higher indicates that the variable is contributing to the component in a meaningful way (Jolliffe, 2014). We chose to include the values of .5 or higher for our component grouping. For future study, lower

eigenvalues can be chosen to include more questions in the components, such as questions 4 and 2 with values of .499 and .415 for component 1, respectively, and questions 9 and 1 with values of .420 and .396 for component 2, respectively.

The PCA has another useful feature built within the statistical output, and that is the Kaiser Meyer Olkin test for sample adequacy. The value of .698 represents an above adequate sample size for our data, where values of .4 and above are considered adequate (see Table 2). This contributes to the meaningfulness of our validity, by ensuring the data is represented by a large enough population.

Readability formulas were easily testable, and produced meaningful results regarding the comprehension of the questions themselves. As represented in Table 5, questions 2, 7, 8, 10 and 11 were found to be within our target age range for our student group (95% 14-15 years old). The other six questions had higher reading levels, and comprehension was at a 12^{th} grade level. Readability and comprehension are determined by word length, sentence length, number of syllables, and sentence construct. Based on these results, we recommend that all questions with a higher than 9^{th} grade reading level be rewritten.

Lastly, a *t*-test run to predict differences between the pre-test and post-test, indicated statistically significant differences from pre- to post-values on each of the two components (see Table 6). The *behavior* subscale mean was 5.9, indicating that students began the education with higher scores, and perhaps positive behaviors at the onset. However, the post-test *behavior* subscale mean still increased to 6.3 ($p < .002$). We found similar results with the *experiential* subscale mean which started at 16.1, but significantly increased to 17.4 ($p = <.001$) after the intervention. We interpret these

results to mean that the ATT curriculum is effective even in a group of students with healthy beliefs about safe sex and abstinence.

In sum, the findings of this study led us to make the following recommendations.

1. Revisions be made to ensure that comprehension level is adequate for the population of students intended.
2. The revised 7-item questionnaire should be used.
3. Additional testing of the revised 7-item questionnaire should be done.

Any questionnaire must first be reliable and valid to ensure its value toward evaluating the effectiveness of the ATT curriculum. This study was the first that applied reliability and validity techniques to a new tool in use in the ATT abstinence-plus curriculum. It provided promising results leading to recommendations for the future study of the tool, and ultimately its application to measure effectiveness in the ATT program.

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Appendix A

I am (circle one): Male Female Age:_____ (Years)
I am (circle one): White Hispanic Black Asian Other

Please CIRCLE the answer that best matches how much you AGREE or DISAGREE. Please answer honestly. Your answers are CONFIDENTIAL.		**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1	Unplanned pregnancy and sexually transmitted diseases are only two of the negative consequences of sex outside marriage.	**1**	**2**	**3**	**4**
2	Hormones are not the biggest factor influencing teens to have sex.	**1**	**2**	**3**	**4**
3	Using a condom correctly every time you have sexual contact will prevent pregnancy and sexually transmitted diseases 100% of the time.	**1**	**2**	**3**	**4**
4	Some sexually transmitted diseases can be transmitted through genital skin-to-skin contact.	**1**	**2**	**3**	**4**
5	It is possible to have a sexually transmitted disease without any symptoms.	**1**	**2**	**3**	**4**
6	If I engage in any type of sexual contact, including oral sex, anal sex, and genital skin-to-skin contact, I will get tested for sexually transmitted diseases.	**1**	**2**	**3**	**4**
7	If I decide to have sex before I'm ready to have a child, I plan to use some form of birth control.	**1**	**2**	**3**	**4**
8	I plan to wait for sex until I am married.	**1**	**2**	**3**	**4**
9	It is possible to set physical and sexual boundaries with my dating partner.	**1**	**2**	**3**	**4**
10	I believe sex has the power to create life, change life, and end life.	**1**	**2**	**3**	**4**
11	I don't think I need to change anything about my sexual health choices.	**1**	**2**	**3**	**4**

Figure 3. ATT Questionnaire.