Designing a Health Promotion Message to Advocate the Use of Clarinet Neckstraps as an Injury Prevention Method in Public School Band Programs

Karla R. Avila
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Karla R. Avila

Dr. Kris Chesky, Faculty Advisor

Dr. Gloria Cox, Honors Director
Abstract

The purpose of this thesis is to develop a health promotion message to encourage the use of clarinet neckstraps by students in public schools in order to prevent medical injuries incurred by forces exerted upon the right thumb during clarinet playing. The target audiences would be (a) clarinet students ranging in age from twelve to eighteen years, (b) band directors, (c) parents of clarinet students, and (d) professionals and teachers of clarinet. This fourth target audience would be reached primarily as an outside observer to the process through journal articles describing the process rather than as a direct target of behavior change.

This thesis would document every aspect of the process of developing and disseminating a health promotion message targeting each of the three audiences appropriately. It would explore several health promotion and behavior change theories and follow the decision-making process of transforming these theories into a message design. This thesis would also discuss the physical evidence from current research supporting the necessity of this injury prevention message and use this research to inform campaign development and message design.

The perceived outcome of this project is a health promotion message which encompasses several aspects, including a pamphlet targeting each of the three audiences which would be disseminated at both a state and a national level, and journal articles discussing the project that would reach a professional audience of performers and pedagogues.
Introduction

Until the last quarter of the twentieth century, little was known in the medical world of the injuries and physical problems associated with playing musical instruments. Musicians have historically viewed injury and pain associated with playing as a sign of weakness and an occurrence that should remain hidden from employers and the public eye if one was to be considered a capable performer. In one of the most competitive professions in the world, the stakes are high and so are the expectations. Performers who are not up to par with these demanding standards are replaceable. Fear of losing their job and their status as an invincible, world-renown player has caused many instrumentalists to hide their pain and very possibly to endure an occupational injury that without medical attention could lead to debilitation.

Because of the lack of attention and concern of instrumentalists with their own medical problems, little has been done in the medical world to attempt to treat and prevent such pain and injury. However, recent progress in the professional musical world and with occupational hazard concerns in the workplace in other fields of labor have brought to light many of these medical issues that instrumental musicians have been enduring all along. In the last two decades an increase in concerted efforts to document the occurrence of occupational injuries in musicians has led to an interest in the medical world to practice appropriate methods of treatment and prevention.

Amateur and professional, young and old instrumental musicians alike experience pain when playing that can often lead to physical injury. The advice of most physicians when confronted with a patient who experiences pain from a repetitive physical act
would be to avoid performing that act. Applying this medical advice to something that one has spent countless hours over many years achieving, oftentimes as a lifelong career, is unfathomable. For this reason it is imperative that the medical and musical worlds unite in finding and advocating methods of treatment and more importantly, prevention, of medical problems associated with playing musical instruments. The careers and livelihood of many instrumental musicians and the future of the art of music performance depend on it.

Current information regarding the medical problems of musicians only includes a few surveys and clinical case reviews in which instrumental musicians are typically grouped into broad categories such as woodwinds, strings, or brass and in which little insight to instrument specific problems is provided. There are unique physical demands and consequently unique physical injuries associated with playing different instruments. Clarinet playing is no exception. In a national musician health survey, 37 percent of clarinetists reported some level of pain in their right wrist (Thrasher & Chesky, 1998). The pain ranged from episodic discomfort while playing to persistent pain with loss of control and use of the hand. When playing the clarinet, forces incurred upon the right thumb used to hold the 1 pound 9 ounce instrument are capable of creating prolonged and localized mechanical stress over tendons and nerves in the hand and wrist. This can lead to pain and serious injury, including cumulative trauma disorders such as carpal tunnel syndrome and wrist tendinitis.

The forces exerted upon the right thumb and consequently upon the wrist and arm during clarinet playing are significantly decreased when wearing an elastic neckstrap (Chesky, Kondraske, & Rubin, 2000a). Therefore, regular use of an elastic neckstrap
when playing can decrease the risk of pain and injury caused by forces incurred upon the
right thumb and wrist. With substantial evidence to suggest the benefits of wearing an
elastic neckstrap, it would be appropriate to disseminate this information in a health
promotion message advocating the use of an elastic neckstrap as an injury prevention
method in clarinet playing.

This thesis documents every aspect of the process of developing a health
promotion message to encourage the use of clarinet neckstraps by students in public
schools in order to prevent medical injuries incurred by forces on the right thumb during
clarinet playing. The target audiences were (a) band directors, (b) parents of clarinet
students, (c) clarinet students ranging in age from twelve to eighteen years, and (d)
professional clarinetists and teachers of clarinet. This fourth target audience would be
reached primarily as an outside observer to the process through journal articles describing
the process rather than as a direct target of behavior change. The development of an
injury prevention message undertaken in this thesis explores several health promotion
and behavior change theories and follows the decision-making process of transforming
these theories into a message design. This thesis also discusses the physical evidence
from current research supporting the necessity of this injury prevention message and how
this research was used to inform message development and design.

The purpose of the development and dissemination of an effective health
promotion message advocating the use of clarinet neckstraps is to significantly increase
the number of band directors who advocate the use of neckstraps by their students as well
as increase the number of parents who support this injury prevention method in public
school band programs. Consequently, the number of clarinetists who wear neckstraps as
an injury prevention method would significantly increase and the prevalence of playing-related injuries in clarinetists would significantly decrease. This is the essential objective of such a health promotion message. However, there are many steps to the process of disseminating such a message and studying the changes in injury prevalence rates in clarinetists after dissemination of the message. These steps in the ongoing process of health promotion message dissemination are beyond the scope of this thesis.

The purpose of this thesis is to design an effective health promotion message. Advocating the elastic neckstrap as an injury prevention method in a health promotion pamphlet individually customized for each of the three target audiences and which utilizes several health promotion theories, models, and strategies within its context is an effective health promotion message design.

Method

The logistics of designing an effective health promotion message required developing a framework for program planning, designing, implementing, and evaluating. According to Maibach and Parrott (1995), developing persuasive messages and using research to inform campaign development and message design using a framework requires a three-step process. First, message goals and information about the audience’s perceived severity of the message and efficacy of the outcome of the message goals must be determined. Secondly, cultural and environmental characteristics and preferences must be assessed to develop the audience profile and cues. Finally, this transient information is used in designing the persuasive message.
However, Anspaugh, Dignan, and Anspaugh (2000) describe the format for developing a health promotion program as an outline of a more specific and detailed process that includes within its context the three steps prescribed by Maibach and Parrott but further develops the final step. Within the early stages of needs assessment is included gaining a profile of the target audience and setting goals and objectives for the program. However, information about perceived threat and efficacy of the message is analyzed later in the process and in more detail according to the social cognitive theories of behavior change in order to invoke strategies that will promote the desired efficacy outcome.

In determining a methodology for the development of message design, both processes were examined and a modified version of the two in combination was utilized. In designing a health promotion message, not only must the target audience be identified and the perceived threat and efficacy of the message be determined, but a careful process of implementing health promotion, behavior change, and social cognitive theories, models, and strategies must be followed. Thus, a more detailed version of Maibach and Parrott's process similar but not identical to that process suggested by Anspaugh, Dignan, and Anspaugh was developed.

The method used to design the health promotion pamphlets advocating elastic neckstraps as a means of injury prevention for clarinetists involved a six step process.

**Step One: Mission Statement and Goal Development**

First, a mission statement was developed describing program expectations, intended target audiences, and the scope of the program. Because this health promotion
The message was to be conducted from the existing research and under the support of the Texas Center for Music and Medicine at the University of North Texas, the mission statement of the center was adopted as the general mission of the health promotion message. The mission of the Texas Center for Music and Medicine is “to develop, apply, and disseminate successful strategies and therapies for dealing with medical and psychological problems of musicians.” This mission statement was geared specifically towards the health promotion message advocating use of clarinet neckstraps through the development of the specific goals of the message.

**Step Two: Needs Assessment**

The second step in the process of message development was Needs Assessment using the following methods:

1. Research on existing studies in the medical problems of musicians, specifically clarinetists,

2. Observation in public schools of the current status of neckstrap use,

3. Identification of the target audiences according to the goals of the message and who the message is meant to reach,

4. Focus groups and interviews with members of the various target audiences in order to determine their existing attitudes and beliefs about wearing an elastic neckstrap to prevent injury,

5. Determining the target audiences’ perceived severity of the risk ascertained in the message and their own susceptibility and efficacy to the threat, and

6. A cost-benefit analysis of the project.
Step Three: Utilization of Behavior Change Theories in Message Design

The third step in the process involved the utilization of behavior change theories, including (a) the Social Cognitive Theory, (b) the Health Belief Model, and (c) the Transtheoretical Model in message design. The criteria of each behavior change theory was examined and its relevance to the health promotion message at hand was evaluated in order to determine its prevalence in the decision-making process involving persuasive message design strategies.

Step Four: Implementation of Strategies

The fourth step in the message design process was developing strategies for behavior change based on evidence of successful strategies in precedent studies which utilized fear appeal and message susceptibility and severity, positive messages, and encouraging risk reduction through response efficacy and self efficacy motivation.

Step Five: Evaluation of Pamphlet Content

The fifth step in the process was the evaluation of the (a) textual and (b) visual content and linguistic variables that motivate cognitive effort in each individual target audience. Marketing and persuasive strategies alike would need to be studied and utilized in order to make appropriate decisions regarding the pamphlet content and its effectiveness in reaching the target audiences and evoking behavior change.
Step Six: Evaluation of Message Effectiveness

The sixth step in the message design process was evaluating the perceived effectiveness of the message content in pamphlet form through (a) focus groups and (b) interviews of each target audience and experts in the field of music education in order to determine the predicted success of the health promotion message at reaching its intended audiences and evoking behavior change. At this point in the process of message design, improvements could be made on the pamphlet design and content based on the target audience and expert trends in opinion on message effectiveness collected in step six until the message format was believed to be satisfactory for dissemination.

Results

Step One: Mission Statement and Goal Development

The mission statement of the Texas Center for Music and Medicine was successfully adopted as the general mission of the health promotion campaign as a whole. As to the specific goals of the project of health promotion message design, objectives relevant to the task at hand were implemented. Essentially, the long-term goal of the message would be to decrease prevalence rates of injury among clarinetists by advocating the use of neckstraps. The immediate goal of the project was to design an effective health promotion message in the form of three pamphlets which utilize behavior change theory and strategy in message design and to increase awareness to target audiences about the benefits of neckstrap use.
More specifically, according to Anspaugh, Dignan, and Anspaugh (2000) in health promotion program planning, the objectives of the project must answer the following four questions in order to be clearly defined:

1. What behavior are we attempting to change?
2. Who are we attempting to reach?
3. How can we reach them?
4. How can we persuade them to change their behavior?

First, we are ultimately attempting to change the behavior of clarinet students who do not wear an elastic neckstrap. Secondly, we are trying to reach band directors, parents of clarinet students, and clarinet students in public school band programs. It is believed that we can reach them through the dissemination of valuable and persuasive information in the form of a pamphlet customized for each target audience. Finally, we can persuade them to change their behavior by implementing health promotion theory and persuasive strategies into a message which communicates not only the severity and susceptibility of the target audiences to the message, but which also empowers each audience with a strong sense of self and response efficacy.

Step Two: Needs Assessment

Once the goals and objectives of the health promotion message were established, need for the message had to be assessed.

1. Background Research on Existing Studies

First, research was conducted on precedent studies about the medical problems that musicians face due to overuse of a specific area of their musculoskeletal system. In a
study of 36 youth symphony members ranging in age from eleven to eighteen years and who had played their instruments an average of seven years, at least two-thirds experienced performance-related musculoskeletal pain (Manchester, 1997). Furthermore, in a study of 120 students at a Houston performing arts high school where students reported practicing and rehearsing an average of 19 hours per week, half (49 percent) reported having had a performance-related problem at some time. The injury frequency was higher for females at 68 percent than for males at 47 percent. Nearly four-fifths of the students believed in a "no pain, no gain" approach to practicing, which indicated that they were not aware of the risk factors involved in injury caused by playing.

In a more instrument-specific study by William J. Dawson, Professor Emeritus of Orthopedic Surgery at Northwestern University Medical School in Chicago, Illinois, it was determined that the manner in which clarinetists support their instrument with their right thumb causes stress upon the ulnar collateral ligament of the intercarpal joint (1997). Thus, prolonged performance or practice can cause strain of the involved muscles as well as sprain of the ligaments about the supporting joints and degenerative arthritic changes may develop in the thumb's basal joint following many years of musical activity. It was also stated by Dawson that "using a neck strap to take some of the weight of the instrument often has been helpful in alleviating thumb pain" and prolonged use of such a support "may delay or minimize the development of significant degenerative joint changes" (1997, pg. 108).

A series of studies conducted at the Texas Center for Music and Medicine at the University of North Texas was geared specifically toward clarinet-specific musculoskeletal problems in the right thumb, wrist, and arm caused by supporting the
instrument. Thrasher and Chesky (1998) developed a unique approach to surveying musicians through the World Wide Web. Over 2,000 musicians participated in the survey. Of the 324 subjects who reported the clarinet as a primary, secondary, or tertiary instrument, a total of 37.2 percent reported musculoskeletal problems in their right wrist and 23 percent reported such problems in their right forearm. The frequency of reported upper-extremity musculoskeletal problems was significantly higher in the right side of the body as compared to the left side. Moreover, the frequency of reported musculoskeletal problems in the fingers, hand, wrist, and forearm was twice as high for female than for male clarinetists. This result provided further support for a previous gender-specific study of the musculoskeletal problems of music students in which 89 percent of the students who reported pain were female (Zetterberg et al., 1998).

In a second study of the clarinet at the Texas Center for Music and Medicine, the radial and axial forces, composite force, and force angle against the right thumb were measured for each fingering over the pitch range of the instrument (Chesky, Kondraske, & Rubin, 2000b). As more keys were pressed, the composite forces increased and the composite angles decreased. Consistent with expectations, linear trend equations for force demonstrated strong linear relationships to the number of keys pressed which lends validity to the dynamic measurements obtained during clarinet performance.

The physical effects of an elastic neckstrap on the forces incurred upon the right thumb and wrist were also studied at the Texas Center for Music and Medicine. The forces incurred upon the right thumb during clarinet performance were measured with and without an elastic neckstrap (Chesky, Kondraske, & Rubin, 2000a). This study demonstrated that an elastic neckstrap caused a significant decrease in axial thumb
forces, composite forces, and composite force angles, suggesting that an elastic neckstrap could reduce risk for cumulative trauma disorders among clarinetists. It is important to note that in this study the elastic neckstrap did not seem to hinder performance technique as perceived by the performers.

A fourth study at the Texas Center for Music and Medicine discussed relationships between musician performance capacities, playing style, and performance related injuries in clarinetists (Chesky, 2000). Overall, 35 percent of clarinetists in the study reported right wrist pain after performance without a neckstrap. A significantly higher number of females reported pain (56.3 percent) as compared to males (20.8 percent) as was found in prior studies. Among clarinetists reporting pain, right forearm isometric strength was lower and right wrist circumference was smaller, which lends validity to the notion that females are twice as likely to experience pain when playing the clarinet than males. Consistent with previous studies at the center, with a neckstrap radial force was higher and axial and composite forces were lower. The results of these studies at the Texas Center for Music and Medicine provided a significant amount of evidence indicating that using an elastic neckstrap while playing the clarinet would reduce forces incurred upon the right thumb, wrist, and forearm and thus reduce the risk for developing cumulative trauma disorders.

2. Observation in Public Schools

The next step in the needs assessment process was observation of band programs in public schools in order to determine the current status of neckstrap use by clarinet students. Ten public school band programs in two Texas cities were observed over the course of a three-year time period. Half of the band programs observed were at the
middle school level with students ranging from age twelve to fourteen years, while the other half were at the high school level with students ranging from fourteen to eighteen years old. Of a total of 372 clarinet students observed over a three-year time period, none wore a neckstrap.

3. Identification of Target Audiences

The third step in the needs assessment process was to identify the target audiences according to the goals of the health promotion message and who the message is intended to reach.

The first of the three target audiences was determined to be band directors. In order for the health promotion message to be effective, band directors would have to advocate the use of neckstraps by their clarinet students. Band directors, who widely range in age, teaching philosophies, and traditional to very progressive pedagogical techniques, would have to be made aware and convinced of the benefits of wearing an elastic neckstrap in order to prevent potential cumulative trauma disorders, pain, and injury to the right wrist and arm.

The second target audience was determined to be the parents of clarinet students. Generally, parents with children involved in extracurricular school activities take a relatively active interest in their children's lives (Maibach & Parrott, 1995). Therefore, parents of clarinet students would be genuinely concerned in their child's health and any risks involved in their extracurricular activities. Such parents would most likely be interested in any safe method of prevention of potential pain or injury caused by playing the clarinet. Arming parents with the knowledge of the benefits of wearing an elastic neckstrap and concerning them with the susceptibility of their own child to the risks of
not wearing one would not only increase a parent's influence on their child's behavior change but also prompt advocacy in reluctant band directors.

The final target audience was determined to be clarinet students in public school band programs. Students would range in age from approximately twelve to eighteen years. Students who actively participate in extracurricular activities tend to be overachievers and have positive attitudes towards their voluntary activities outside of required academic courses (Maibach & Parrott, 1995). Such students also tend to have stronger and more frequent communication with their parents than do those not involved in extracurricular activities. Therefore, clarinet students would most likely be very receptive towards a health promotion message which advocated wearing an elastic neckstrap as an injury prevention method if the message effectively informed of risk severity, audience susceptibility, and audience self and response efficacy. Furthermore, clarinet students would be receptive to support from influences in their environment such as parents and band directors in order to insight behavior change.

4. Focus Groups and Interviews

After target audiences were identified, focus groups and interviews with members of the different target audiences were conducted in order to determine attitudes and beliefs about neckstrap use prior to message dissemination.

A focus group conducted with eight middle school clarinet students determined that students of this age group had not been exposed to or ever even heard of a clarinet neckstrap. The students ranged in age from twelve to fourteen years and were equally divided by gender. All of the eight students were familiar with saxophone neckstraps, but only two of the students had ever considered the thought of a neckstrap for the clarinet.
None of students had ever inquired about the possibility of a clarinet neckstrap to their band director. Five of the students (4 female and 1 male) reported occasional pain in the right wrist from playing the clarinet for a period of time longer than their usual daily regiment. Of the five students who reported pain, two reported having consistent pain in their right wrist when playing. None of the students had ever mentioned pain while playing to either their band director or their parents. The general trend in beliefs among these students was that pain was a normal occurrence of playing a musical instrument. The results of this focus group indicated that generally, middle school-aged clarinet students are not aware of the risks of persistent pain and potential injury from clarinet playing, nor are they aware of the existence of a clarinet neckstrap or its benefits in preventing such pain and injury.

Phone interviews were conducted in which a series of questions was asked to ten band directors of middle and high school level band programs in two Texas cities about their existing beliefs and attitudes regarding the use of clarinet neckstraps. The list of interview questions can be found in Appendix A1. After the questions were answered, an opportunity was given to each band director to give any additional opinions regarding their attitude or beliefs about clarinet neckstrap use and their perceived attitudes and beliefs of their colleagues. Only half of the band directors interviewed were aware that clarinet neckstraps exist. Only one was aware of the benefits of a neckstrap in reducing risk of pain in the right wrist, but none were aware of the evidence existing to scientifically support this notion. Two band directors considered themselves to be against the use of clarinet neckstraps for several reasons which are discussed in Appendix A2. Seven band directors had never considered whether they were for or against the use
of clarinet neckstraps. One considered herself to be for neckstrap use but did not enforce it in her band program. Nine were interested in more information regarding the benefits of neckstrap use and the evidence supporting this notion. Eight declared that they would advocate the use of clarinet neckstraps in their program if they were provided with sufficient evidence regarding the benefits of neckstrap use and felt that the need was apparent in their own program. Two remained undecided regardless of evidence of the benefits of wearing a neckstrap or perceived susceptibility of their own students.

Six of the ten interviewees shared additional comments regarding their perceived attitudes and beliefs of themselves and their colleagues regarding clarinet neckstrap use. Factors believed to influence a band director’s decision not to advocate clarinet neckstrap use included (a) uniformity of appearance, (b) the possibility of negative effects of a neckstrap on performance, (c) unwillingness of students to cooperate, (d) influence of colleagues and supervisors, (e) the breaking of tradition, and (f) a general lack of knowledge on the issue. A detailed list of the general trends in these reported beliefs can be found in Appendix A2.

The results of these interviews indicated that there was a lack of knowledge among band directors regarding the risks of pain and injury incurred by forces on the right thumb during clarinet playing, the susceptibility of their own students to these risks, and the evidence indicating the benefits of wearing an elastic neckstrap in order to minimize these risks. According to Downie, Tannahill, and Tannahill (1996) an audience is more likely to change their attitudes on an issue on the basis of new information so long as the arguments or methods of presentation are not too extreme. Furthermore,
audiences who genuinely feel that the consequences of attitude change directly affect them in a positive manner are more likely to change their behavior (Downie et al., 1996).

Therefore, it was determined that an informative and persuasive pamphlet directed towards each target audience which presented new information on the issue to each group in a manner which would address how the message directly affects them and increased their perceived level of severity and susceptibility would be an effective method of message design.

5. Determining Target Audience Severity and Susceptibility

The next step in the needs assessment process was to determine each target audience's perceived severity of the risk of not wearing a neckstrap as ascertained in a health promotion message and their own susceptibility and efficacy to the threat. Again, the trend in the case of every target audience was a lack of knowledge and awareness of any risks involved in playing an instrument without a neckstrap. However, both the results of the focus group with clarinet students and the interviews with band directors indicated that if aware of their own susceptibility to the potentially severe risks of playing the clarinet without a neckstrap, both groups would likely advocate changing their behavior in order to promote neckstrap use as an injury prevention method. Therefore, it was determined that in order for a health promotion message advocating the use of clarinet neckstraps as an injury prevention method to be effective, the message would have to communicate to each target audience that they were indeed susceptible to the risks involved in not advocating neckstrap use and that the severity of the threat was significant enough to motivate a change in behavior.
6. Cost-Benefit Analysis

The final step in the needs assessment process was to conduct a cost-benefit analysis in order to determine whether there was enough evidence of need with little risk involved in order to proceed with message development. The studies conducted at the Texas Center for Music and Medicine indicated that there was no known risk of injury involved in wearing an elastic neckstrap and that the benefits of neckstrap use were only positive as indicated in the studies conducted by Chesky (2000). Although it had not been determined to what degree regular neckstrap use might be beneficial to clarinetists in the long-term, there was sufficient evidence to support the notion that neckstraps were beneficial to some degree as indicated in the studies. Furthermore, it was determined that the method of message design, a color pamphlet that could be reproduced in mass amounts, was low enough in monetary cost to be approved for the budget of the center. With costs having been determined as considerably low and benefits of designing the message determined to be strictly positive to an unknown degree, the cost-benefit analysis indicated that there would be no real risks involved in proceeding with message design.

Step Three: Utilization of Behavior Change Theories in Message Design

The third step in the message design process was to utilize behavior change theory in message design, including (a) social cognitive theory, (b) the Health Belief Model, and (c) the Transtheoretical Model of behavior change.
Social Cognitive Theory

The social cognitive perspective on health behavior change is that individual behavior change can be facilitated by modifying a target audience's personal factors and by altering environmental factors to encourage behavior change. According to Maibach and Parrott (1995), social cognitive theory "presents a balanced and optimistic view of the human condition: people and their behaviors are shaped by their environments, yet people also shape their environments through their behavior and expectations." This notion gave validity to the approach of message design incorporating the use of three separate target audiences in order to promote behavior change. Because the essential goal of the message was to invoke a change in the behavior of clarinet students in public schools, not only would the students themselves need to be motivated to change their behavior, but influences in their environments, in this case parents and band directors, would need to support this change in behavior. Consequently, students who changed their behavior, resulting in a positive outcome with proven health benefits, would alter the attitudes of those influences in their surrounding environments to encourage continued participation in behavior change.

According to social cognitive theory, the role of several personal factors is key in health behavior change (Maibach & Parrott, 1995). The first of these factors is knowledge. Before behavior change is likely to occur, people must have knowledge both about the risk factors and the ways in which their risk factors can be reduced. This factor was utilized in the message design by the implementation of information in message content which discusses the high frequency of reported pain and injury in studies
involving clarinet playing and the evidence which supports using a neckstrap as a way of significantly reducing the risk of such pain and injury.

The second factor necessary to invoke behavior change is the identification and modeling of the skills required to perform the behavior being suggested by the message. By literally declaring the use of an elastic neckstrap as a clear and simple method of injury prevention through text and visual aids and including influential role models who advocate using a neckstrap in pamphlet content, this second factor was achieved in message design.

The third factor in behavior change is self-efficacy. When a target audience has judged itself to be efficacious, it is confident in its capability to overcome the difficulties in changing and maintaining a specific behavior. This factor was achieved in message design by convincing the target audiences that neckstraps are affordable, easily available, simple to use, and pose absolutely no harm or negative affects if worn.

The final factor of social cognitive theory that invokes behavior change is establishing positive outcome expectations as a major source of motivation. The message design utilized this motivating factor by convincing the target audience of the benefits of wearing an elastic neckstrap to their health and to their performance on the clarinet.

The Health Belief Model

The Health Belief Model supports the theory that people must perceive themselves to be susceptible to a condition and must consider that condition to which they are susceptible to be severe enough to do something about or they will not act (Anspaugh, Dignan, & Anspaugh, 2000). By incorporating into message design textual content that directly states the severity of the risk of not wearing a neckstrap and the high
frequency of susceptibility of people in the target audience of clarinet students to those risks, the message effectively utilized this theory, assuming that band directors and parents of these students would be genuinely concerned for their safety and in the case of band directors, for the success of their band program.

**The Transtheoretical Model**

The Transtheoretical Model is based on the theory that people pass through phases towards change (Anspaugh et al., 2000). The first stage is precontemplation, where people may not even be aware of the risk or problem, as is believed to be the case with clarinet students, parents, and band directors as supported by observation in the field (Maibach & Parrott, 1995). Therefore, people must be moved from precontemplation to contemplation by utilization in message content of the first factor of social cognitive theory and the Health Belief Model, in which the message is communicated that people are indeed at risk and that the risks are severe enough to take action. In order for people to move from contemplation to preparation, the next phase towards behavior change, people must be motivated by self and response efficacy. If the target audience perceives itself as capable of behavior change and feels that its susceptibility to the risks of not changing behavior is motivation enough to make the effort, then the target audience will move to the next phase of behavior change, taking action.

Action involves the restructuring of the target audience's environment in a manner conducive to building a supportive relationship with influential motivators. By motivating parents and band directors to advocate behavior change in students, the message design could successfully lead its target audience to the next phase of behavior change, maintenance. Maintenance of a change in behavior is the true determinant in
message effectiveness. In order for a message to motivate maintenance of behavior change, a message must effectively reinforce self-efficacy and reiterate the positive consequences of behavior change.

In the case of this health promotion message, methods of motivating maintenance included persuading students, parents, and band directors that a neckstrap can positively affect performance issues such as technique, hand position, and tone quality as well as prevent pain and injury that could possibly lead to debilitation.

Step Four: Implementation of Strategies

After having taken each of the aspects of behavior change theory into account in message design and effectiveness, strategies were developed, with the support of evidence of success in precedent studies, based on the utilization of fear appeal and positive messages in health promotion message design. In a content analysis study of breast self-examination (BSE) pamphlets grounded in fear appeal research conducted by the Health Communication Department at Purdue University (Kline & Mattson, 2000), researchers isolated messages in BSE pamphlets that were consistent with the variables of severity, susceptibility, response efficacy, and self efficacy, identified by existing fear appeal research and supported by other persuasion research as critical to construction of effective health promotion messages. Statistical analyses were used to describe the relation among these four message variables. Findings suggested that BSE pamphlets contained an unbalanced proportion of threat to efficacy arguments and that efficacy messages were substantially weak in contrast to the relatively strong mammography arguments contained in these pamphlets. Because there were few response efficacy
messages as compared to cancer threat messages in these pamphlets, a person would most likely fail to be motivated into behavior change due to the lack of perceived ability to succeed in behavior change. Furthermore, self efficacy arguments were weakened by the strength of mammography messages as compared to BSE messages in these pamphlets. Such a weakness in self efficacy could lead the target audience to fail to perceive BSE as a viable method of self efficacy as compared to other potential methods.

These findings revealed the necessity of a balance between fear appeal severity and susceptibility arguments and positive messaging of self and response efficacy motivational factors. In the presentation of neckstraps as an effective means of injury prevention in the pamphlet message, it was imperative that neckstraps be presented as the primary efficacious solution without barriers of hindrance from mention of other prevention methods.

**Step Five: Evaluation of Pamphlet Content**

In the fifth step of the message design process, (a) textual and (b) visual content and linguistic variables that motivate cognitive effort in each target audience were evaluated and utilized.

**Textual Content Variables**

In order to attract the audience's attention to the message, the cover of each pamphlet had to evoke enough fear to raise concern of the audience's own susceptibility to the risk and cause them to desire further information. Once the audience member opened the pamphlet in search of more information, the evidence would be presented to increase their perception of the severity of the message and of the frequency of reported
susceptibility cases in members of their target group. It is crucial that these facts be believable and not too extreme and that the evidence come from reliable sources and that these sources be clearly cited within the text. Then neckstraps were identified as the effective method of injury prevention that could easily be utilized by the target audience in behavior change. Self and response efficacy were increased by assuring the audience of neckstrap affordability, availability, and simplicity of use. Essentially, the fear appeal factors of severity and susceptibility were used to evoke a willingness to change behavior and positive messaging was used to increase efficacy motivation. See Appendix B1 for parent target audience pamphlet.

Additional factors that were utilized specifically in the band director pamphlet included a section that separated myth from fact regarding the benefits of neckstrap use. In a study which utilized focus groups to develop a heart disease prevention program for ethnically diverse, low-income women, target audience members in focus groups expressed a desire to develop knowledge to help them separate health myths from facts in order to reduce their misconceptions about cardiovascular diseases (Gettleman & Winkleby, 2000). With this theory being supported in the success of this precedent study, the notion was utilized in the band director pamphlet. Also included in the band director pamphlet was a section on "Knowing the Signs of a Student Needing a Neckstrap." This section of the pamphlet content gave the band director proof of susceptibility in his/her own students and reached the band director on a practical rather than theoretical level. Finally, the band director pamphlet also included endorsement of the message by influential experts in the field. This marketing technique is utilized with great success in advertising as a means of a social cognitive approach to behavior change.
in which modeling by respected and renown individuals or celebrities is persuasive to the target audience (Maibach & Parrott, 1995). See Appendix B2 for band director target audience pamphlet.

**Visual Content Variables**

The visual considerations involved in pamphlet design were color scheme, the trifold format, and the use of photographs and pictures. The colors chosen for the pamphlet were the colors utilized on the Texas Center for Music and Medicine web page in order to tie the pamphlets to their sponsor. A combination of shades of purple with a contrasting teal green or bright yellow were used on a glossy finish in order to present the pamphlets in a professional and attractive manner. A conscious effort was made to avoid using too many colors which could distract the reader from the content of the message. The trifold format was chosen because it could be constructed from letter-sized paper, making it easy to reproduce in mass quantities and to disseminate by mail if necessary. Furthermore, a trifold design clearly displayed the necessary information in an easy to read and user-friendly manner. The photographs of a clarinet student first without a neckstrap and appearing to be in pain and secondly with a neckstrap in correct playing position were chosen in order to add interest to the pamphlet design and to display visual evidence of the message being delivered. The photograph of the student appearing to be in pain was printed on the cover of each pamphlet in order to increase the immediate fear appeal of the message, while the photograph in which the student is wearing a neckstrap appeared inside each pamphlet as visual evidence of the efficacy of the health promotion message.
Step Six: Evaluation of Message Effectiveness

The final step in the message design process was the evaluation of the perceived effectiveness of the message through (a) focus groups and (b) interviews with each target audience and experts in the field in order to determine the predicted success of the health promotion message at reaching its intended audiences and evoking behavior change.

Focus Groups with Target Audiences

Two focus groups were conducted with music education students at the university level in a woodwinds methods class, a pedagogical course for future band directors. These focus groups revealed several themes in opinions regarding message effectiveness. In general, opinions of message effectiveness were very positive. Focus group participants felt that the visual appearance of the pamphlets was attractive and that the cover of each pamphlet was effective in evoking a concerned interest in learning more information regarding the issue at hand. Participants also felt that the textual content of the pamphlets was well-balanced in its fear appeal and efficacy variables. The section in the band director pamphlet entitled "Knowing the Signs of a Student Needing a Neckstrap" was a suggestion of the focus group participants. This suggestion was determined to be an effective method of increasing the evidence to band directors of the susceptibility of their own students to the risks involved in failing to wear a neckstrap and was therefore included in the message content.

A focus group was also conducted with a group of parents of middle school-aged clarinet students. The trend in opinions of this group to message effectiveness was very positive. In general, focus group participants felt the fear appeal of the message was highly effective in raising concern and the information given inside of the pamphlet was
perceived to be very clear in advocating the use of a neckstrap to prevent possible pain and injury to the student. The section in the parent pamphlet concerning the availability of neckstraps was a suggestion of the focus group participants which was determined to be effective in increasing the efficacy of the neckstrap message and therefore included in the content of the pamphlet.

**Interviews with Music Education Faculty**

Interviews were conducted with members of the music education faculty at the University of North Texas in order to gain further evidence as to the perceived effectiveness of message design by experts in the field of music education. These interviews resulted in several trends in opinions. Regarding the parent pamphlet, the suggestion was made to be wary of a fear appeal strategy that may be so vague as to include notions of perceived injury beyond those that realistically exist. This suggestion was taken into consideration, especially regarding the cover of the pamphlet, which may lead a parent to believe that playing in the school band is dangerous in ways beyond injuries as a result of forces exerted upon the right thumb during clarinet playing. Because parent participants in the focus group did not appear to be alarmed by this possibility and conversely were of the opinion that this fear appeal strategy was effective in reaching the target audience and that the clarity of the information within the pamphlet was satisfactory, the wording of the cover of the parent pamphlet was reconsidered but not altered. Another suggestion of the music education faculty was to avoid referring to "proper methods of prevention" in the plural sense. This reference was intended to be directed only at neckstrap use and not at any other method of prevention and could easily confuse the audience and weaken the efficacy of the neckstrap message.
Regarding the band director pamphlet, the music education faculty cautioned of the possible exaggeration in the endorsement of the message by referring to prominent supporters of message advocacy as "the world's most well-respected" and suggested the more modest but believable phrasing "the country's most well-respected." This allowed for the preservation of message credibility. In general, music education faculty members perceived both pamphlets to be very effective in reaching their intended audiences in order to evoke behavior change.

Precedent studies confirmed that involving the target audience in the designing process of health promotion messages allowed the target audience to define their own needs and control their own solutions in a manner that successfully increased effectiveness of message outcomes (Gettleman & Winkleby, 2000). Because no focus group involving the clarinet student target audience was conducted to evaluate message effectiveness, the effectiveness of this pamphlet was considered inconclusive. Proceeding with the designing of this pamphlet at this point in the process would consciously neglect to consider the opinion of the target audience. Therefore, the designing of the student pamphlet could not be completed until further evaluation of its effectiveness as perceived by the clarinet student target audience could be accomplished.

Discussion

Based on the positive results of the focus groups and interviews with the target audiences and experts in the field of music education on the perceived effectiveness of message design, it can be concluded that the purpose of this thesis was accomplished: to design an effective health promotion message advocating the elastic neckstrap as an
injury prevention method in a health promotion pamphlet individually customized for each of three target audiences and which utilizes several health promotion theories, models, and strategies within its context.

A serious limitation of this project was the inability to evaluate the effectiveness of the message as perceived by clarinet students themselves. Further studies should be conducted to determine the results of this temporarily inconclusive variable.

The practical effectiveness of this message would then have to be measured in an appropriate amount of time after dissemination of the message to its target audiences in order to determine if the message would be successful in significantly increasing the number of clarinet students wearing an elastic neckstrap and significantly decreasing the prevalence rates of injury to the right thumb, wrist, and forearm of these students. However, because the actual extent of the health benefits of wearing an elastic neckstrap have yet to be determined in a measurable form and the degree of positive effects of neckstrap use on potential injury are unknown, the quantitative effectiveness of this health promotion message cannot yet be determined. The quantitative effects of neckstrap use on injury prevention warrant further study.

Although an effective health promotion message was successfully designed, this is only the first step in designing and implementing an entire health promotion program. Methods of message dissemination must be determined and carried out. Furthermore, methods of incorporating this message into music education and instrumental pedagogy courses at the university level should be examined.

It is imperative that the medical and musical worlds continue their cooperative efforts in finding and advocating methods of prevention of medical problems associated
with playing musical instruments. The Texas Center for Music and Medicine will continue to work towards treating and preventing physical pain and injuries that threaten the future of the art of music performance.


Appendix A1. Interview Questions Determining Perceived Awareness and Attitudes of Band Directors towards Clarinet Neckstrap Use.

1. Are you aware of the existence of a device known as a clarinet neckstrap which serves the same purpose for a clarinetist as does a saxophone neckstrap for a saxophonist?

2. Are you aware of any benefits of such a neckstrap in reducing pain in the right wrist of a clarinetist?

3. If so, are you aware of any scientific research which provides evidence to the notion stated in question 2?

4. Would you consider yourself as being against the use of clarinet neckstraps in your band program?

5. Have you ever considered whether or not you may be for or against the use of clarinet neckstraps?

6. Would you consider yourself to be for the use of clarinet neckstraps in your band program?

7. Would you be interested in more information regarding the benefits of neckstrap use and the evidence supporting this notion?

8. Would you advocate the use of clarinet neckstraps in your band program if you were provided with sufficient evidence regarding the benefits of neckstrap use?

9. Do you feel that the need for clarinet neckstraps is apparent in your program?

10. Would you remain undecided in your opinion of neckstraps regardless of evidence of the benefits of wearing a neckstrap?
Appendix A2. Factors Influencing a Band Director's Decision not to Advocate Clarinet Neckstrap Use

Appearance
- Not uniform unless mandatory
- Looks messy or untraditional
- Appears a sign of weakness in players
- Affects judges' perception of group during competitions
- Interferes with traditional resting position of clarinet across lap

Performance
- Belief that neckstrap affects tone quality
- Negatively alters embouchure or technique
- Neckstrap use literally weakens a player physically

Attitude of Students
- It looks funny
- It looks wimpy
- Unwillingness to hold clarinet at attention without a neckstrap during marching band after being conditioned to play with a neckstrap
- Fear that other kids will tease them about it

Influence of Colleagues and Supervisors
- Pressure or discouragement from supervising directors (HS over MS)
- Don't see advocacy at the university level and therefore don't see it necessary to follow suit
- Private instructors don't advocate use of neckstrap

Breaking Tradition
- It has never been done before
- No one ever complained about pain in the past
- It is merely the "latest fad"
- "If it ain't broke, don't fix it"

Lack of Knowledge on the Issue
- Unaware of scientific evidence proving the benefits of neckstrap use
- Unaware of serious health risks posed by not wearing a neckstrap
- Not aware of the importance and seriousness of the issue
- Do not feel they are putting their students at risk by neglecting to advocate Neckstrap use
- Belief that it is all a sham