

The Delphi Method: An Approach for Facilitating Evidence Based Practice in Athletic Training

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Objective: The growing importance of evidence based practice in athletic training is necessitating academics and clinicians to be able to make judgments about the quality or lack of the body of research evidence and peer-reviewed standards pertaining to clinical questions. To assist in the judgment process, consensus methods, namely brainstorming, nominal group technique and the Delphi method can be used. The purpose of this paper is to review the literature related to the Delphi Method and its potential implications for evidence-based practice and peer-reviewed standards in athletic training.

Data Sources: We searched PubMed and MEDLINE (1978-2007), CINAHL (1993-2006), Dissertation Abstracts (1979-2006) and Google Scholar (1983-2007) using the terms "Delphi method," "modified Delphi technique," "consensus methods," "Delphi technique," and combined search terms of "Delphi method AND allied health, AND medicine AND dentistry, AND nursing.

Data Synthesis: Textual support for the use of the Delphi Method in athletic training and a brief review of the literature pertaining to the: objectives; advantages; limitations commonly associated with the use of the Delphi Method; and research protocol.

Conclusions/Recommendations: The Delphi Method in athletic training has been used to fulfill two objectives; the need for evidence based practice and the need to establish policies and procedures when none are in existence or it is difficult for one individual to make a decision. The Delphi Method and other consensus development methods should not be viewed as a scientific method for creating new knowledge, but rather as processes for making the best use of available information, be that scientific data or the collective wisdom of participants.

Key Words: Delphi survey technique, group decision making, consensus, experts, nominal group

The growing importance of evidence based practice in athletic training necessitates that academics and clinicians are able to make judgments about the quality of the body of research evidence pertaining to clinical questions. Evidence based practice integrates best available external clinical evidence from systematic research with individual clinical expertise.¹ This is described as the proficiency and judgment acquired through clinical experience. Since evidence based practice is in the infancy stage with athletic training, it is difficult to make effective decisions in situations where there is contradictory or insufficient information. Therefore, use of consensus methods, namely brainstorming, nominal group technique and the Delphi Method can be used.² The Delphi Method and other consensus development methods should not be viewed as a scientific method for creating new knowledge, but rather as processes for making the best use of available information, be that

scientific data or the collective wisdom of participants.³ Accordingly, the Delphi Method is best suited for situations where evidence based practice is dependent on clinical expertise or expert opinion.

Ziglio⁵ described the Delphi Method as "a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback". The Delphi Method has been characterized as a systematic, effective, and comprehensive technique for administering a group communication process that enables a collection of knowledgeable individuals to reach a consensus of opinion in circumstances when the available information is incomplete or multi-disciplinary in nature.^{6,7,8} The Delphi Method has also been recommended for use when the complexity or ambiguity associated with a particular problem exceeds the intellectual capabilities of a single decision-maker.^{6,8-10} The underlying assumption of the Delphi Method is that the informed, collective judgment of a group of experts is more accurate and reliable than individual judgment^{5,6,11} within dynamic environments where effective decision-making is dependent on the "knowledge, resourcefulness, expertise and creativity [of] different types of people".¹⁰ The purpose of this paper is to review the literature related to the Delphi Method and its potential implications for evidence-based practice and peer-reviewed standards in athletic training. The following sections provide textual support for the use of the Delphi Method in athletic training and a brief review of the literature pertaining to the: 1) objectives; 2) advantages; 3)



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limitations commonly associated with the use of the Delphi Method; and 4) research protocol.

Delphi Method Objectives

The Delphi Method was initially developed by Norman Dalkey and Olaf Helmer at the RAND Corporation during the 1950's and 1960's for the purposes of military technology forecasting,¹⁰⁻¹² information gathering,⁸ and group decision-making¹³. The Delphi Method has since matured and proven to be a highly adaptable research methodology that has been used in numerous industry sectors including health care, education, business management, information technology, military science, engineering, and transportation.¹⁴ More specifically, a literature search in the related areas of Allied Health, Medicine, Nursing and Dentistry indicated researchers in these fields have employed the Delphi Method to answer a variety of research questions (see Table 1).

Table 1. Use of the Delphi Technique in Allied Health, Medicine, Nursing, and Denistry

Database	Years	Number
CINAHL - English, Allied Health	1993-2006	13
CINAHL - No Specification	1993-2006	42
Dissertation Abstracts (General)	1979-2006	334
Google Scholar	1983-2007	259
Medline	1978-2007	266
PubMed	1978-2007	107

The Delphi Method is considered to be most useful in situations when precise analytical study is not possible due to the uncertain or ambiguous nature of the research problem.^{5,15,16} Ziglio⁵ reported that an individual may select from the following two courses of action when the problem-solving process is dependent upon inadequate information and incomplete theory:

The first option is to wait (perhaps indefinitely) until we have an adequate theory based on tested scientific knowledge enabling us to address the problem concerned. Of course, this option is not feasible if the problem needs urgent attention and action. Furthermore, many social and health problems are not amenable to solution by pure positivistic or 'scientific' methods.¹⁷ The second alternative is to make the most of what is, admittedly, an unsatisfactory situation, and to try to obtain the relevant intuitive insights of experts and use their informed judgment as systematically as possible. According to Dalkey¹⁸ the rationale and use of the Delphi Method represents a systematic effort within the second alternative.

The Delphi Method is predicated on the underlying assumption that the informed judgment from a group of experts is likely to be more reliable and accurate than the judgment of a single individual or group of non-experts^{5,10} Murry and Hammons¹⁶ reported that the Delphi Method could be implemented as a valid research technique

in situations where: 1) the logistical constraints make repeated multiple group meetings infeasible; 2) the heterogeneity of the participants must be maintained to ensure validity of results; 3) the individuals needed to contribute have diverse backgrounds and no established history of communication; 4) the group process must incorporate too many individuals for a face-to-face group exchange; and 5) the disagreements among individuals are "so severe or politically unpalatable that the communication process must be refereed and/or anonymity assured."

The research objectives that are commonly associated with the Delphi Method remain connected to the rationale that underlies this group decision-making process. The three fundamental objectives of the Delphi Method have been summarized as the 1) development of a range of responses to a problematic issue; 2) the ranking of a range of responses in order to provide an indication of significance; and the 3) establishment of consensus regarding a range of responses.⁸ Similarly, Stahl and Stahl¹³ identified the following possible objectives of a Delphi investigation: 1) identifying and investigating underlying assumptions that contribute to divergent judgments or opinions; 2) ascertaining information that may help to generate a consensus of opinion from a selected panel of experts; 3) establishing relationships between expert judgments in the form of rankings on a topic that pertains to a number of disciplines; and 4) educating the respondent group to the diverse and multi-disciplinary nature of the topic in question.

Advantages of the Delphi Method

The inherent flexibility of the Delphi Method affords researchers numerous advantages when identifying the research question, planning the research design, collecting and analyzing data, and documenting the research process.¹⁴ The distinct characteristics of the Delphi Method contribute to its usefulness as a research instrument in policy decision-making and long-range forecasting.¹¹ The most significant benefit of the Delphi Method concerns participant motivation. When conducted properly, the Delphi Method enables the research participants to assume ownership of a particular problem and its accompanying solution.¹⁰ This sense of personal ownership translates into a more effective and efficient resolution to the problem.

Additional advantages of the Delphi Method include the improvement in the accuracy of the decision-making process due to the use of controlled-feedback and anonymity; elimination of the geographical and logistical impediments inherent to face-to-face group meetings; establishment of consensus based on the group's systematic evaluation, reflection, and reevaluation of the pertinent issues, and statistical description of the group responses.¹⁶ Ziglio⁵ reviewed the relevant literature and argued that the strengths of the Delphi Method pertain directly to its ability to focus attention on the most relevant issues, provide a framework for group communication among individuals with divergent backgrounds and geographical locations, minimize the psychological and professional barriers to communication that are inherent to face-to-face meetings, provide an equal opportunity to respond for all the participants, and produce a detailed record of the decision-making process and the resultant informed judgment.

Limitations of the Delphi Method

Despite the proposed benefits of this group decision-making process, critics have raised concerns related to the sampling and

data analysis techniques associated with the Delphi Method.¹⁹ Clayton⁶ stated that while most of these criticisms regarding the scientific rigor of the Delphi Method have been addressed in the literature, it is essential that the researcher acknowledge and account for the following limitations in his or her research design:

1. The personal backgrounds and experiences of the panel members are generally beyond the control of the researcher.
2. The panel members' personal and professional responsibilities may limit the amount of time and effort that each individual can invest in the decision-making process.
3. The process by which the panel arrives at consensus remains largely unknown. It is uncertain whether the panel members alter their decision-making process as a result of careful reconsideration or the pressure to conform.
4. The results of a Delphi Method cannot be generalized beyond the specific panel of experts that participated in the study. Additionally, the strength of the findings depends largely on the backgrounds and perceptions of the panel members.

Murry and Hammons¹⁶ suggested that the questions formulated by the researcher could influence the panel members' responses and that the researcher can never be completely certain that the participants' fully comprehend the purpose of the study. Furthermore, the researcher may never be able to evaluate each panel member's full expertise due to the absence of face-to-face meetings. As with other forms of survey research, participant motivation and non-response rate or sample attrition remain primary concerns as well. McKenna²⁰ recommended the use of face-to-face interviews during the first round of a study to help increase response rates throughout the Delphi process. That type of direct interaction among the researchers and panel members, although time consuming, may help to mediate additional questions regarding the Delphi panel members' qualifications and their understanding of the research process.

Jeffery and Hache⁸ suggested that the Delphi Method is not an effective research tool for routine decision-making due to the time-consuming nature of the communication process. The time delays between rounds may prove to be problematic if the research involves nonprofessional or young respondents. The multiple rounds of questionnaire circulation that are employed increase the required time for completion of the study. Advances in computer networking and electronic mail may help to eliminate this restriction and allow for more expedient questionnaire circulation, simultaneous data collection and transcription, and enhanced group interaction among Delphi panelists.^{14,21} The Delphi Method, unlike other survey research protocol, also requires a continued commitment from expert panelists over multiple rounds of questionnaire circulation.²⁰ This level of commitment can be difficult to achieve unless specific measures are taken throughout the research process to recruit and retain Delphi panel members. A number of strategies can be used to minimize this potential concern: pre-notification post-cards, phone calls, and/or e-mails to prospective panel members; written contracts and incentives to ensure panel member compliance; and continual reminders

regarding the importance of each individual panel members' contributions to the research process.

In numerous Delphi studies, the concept of consensus has been vaguely defined and there is little agreement among researchers concerning the statistical determination of group consensus.²² The Delphi Method has also been criticized regarding the manner by which consensus is achieved.² Critics have argued that the consensus is weakened due to limited participant discussion and lack of opportunities for participants to elaborate on their opinions or ideas. In light of these methodological limitations, researchers must be careful not to overstate the significance of their findings.² The determination of group consensus does not imply in any way that the correct answer or judgment has been reached in relation to the research question or problem. The ultimate value of the Delphi Method pertains to its use as a means for structuring group interaction and generating possible solutions to complex theoretical issues or problems. When used in this manner the Delphi Method can be an excellent way to generate initial thoughts and ideas on a topic that might require future investigations.

The results of a Delphi investigation are specific to the panel of experts. The results are not necessarily repeatable with other groups of similarly qualified members due to the considerable variation in individual backgrounds that exist. Even the most well planned Delphi study may not yield "an exhaustive nor all-inclusive set of ideas".⁶ While a Delphi study may produce thought-provoking results, "the value of the information is for the individual reader to decide and is limited due to the constraints imposed by the panel selection, as well as by the backgrounds, experiences and biases of each member".⁶ In response to this limitation, many researchers recommend the need for further study to better generalize the results to a wider population.¹⁴ These verification studies can focus on a number of objectives including refining and verifying results, extending the results with a similar or different sample, and/or investigating a set of related research questions.

Delphi Method Protocol

In order to understand the protocol that should be followed when incorporating the Delphi Method, the following sections will be included: the Delphi panel, questionnaire design and administration, asynchronous and anonymous participation, supervision and feedback, and group consensus.

The Delphi Method has been characterized as a highly flexible problem-solving process that provides "an opportunity for structured communication, by which expert panel members could provide feedback, revise judgments, and contribute to the development of agreed-upon practices - all with complete anonymity".²³ Keeney et al.²⁴ provided a description of a general administrative protocol in their critical review of the Delphi Method. The Delphi process begins with an initial questionnaire (round one) that uses open-ended questions to generate a list of ideas or concepts related to the research question. Members of the research team analyze, collate, and compile an inclusive list of responses for resubmission to the expert panel in the form of a second round questionnaire.²² In all subsequent rounds of the Delphi process, the panel members are provided with feedback regarding their individual responses and those of the other panelists. Descriptive group statistics such as mean, mode, and standard deviation are shared between successive rounds and the panel members are asked to reconsider and change their individual ratings

DELPHI METHOD TASKLIST		WEEKLY TIMELINE																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Clarify the research problem or question																					
• Conduct literature review related to topic																					
• Determine if Delphi Method can be used																					
2. Develop research protocol to be used																					
• Research Delphi Method and its variations																					
• Identify method of data collection																					
• Determine structure and number of rounds																					
• Define concepts of expert and consensus																					
• Account for key methodological limitations																					
3. Recruit experts for Delphi panel																					
• Create sampling frame for panel selection																					
• Select and recruit panel members from list																					
• Clarify panel member responsibilities																					
4. Collect and analyze data (R1) - Explore																					
• Design and pilot test Round 1 survey																					
• Provide panel with 1 st survey																					
• Follow-up with panel members as needed																					
• Analyze and compile panel responses																					
5. Collect and analyze data (R2) - Evaluation																					
• Design and pilot test Round 2 survey																					
• Provide panel with feedback and 2 nd survey																					
• Follow-up with panel members as needed																					
• Analyze and compile panel responses																					
6. Collect and analyze data (R3) - Evaluation																					
• Design and pilot test Round 3 survey																					
• Provide panel with feedback and 3 rd survey																					
• Follow-up with panel members as needed																					
• Analyze and compile panel responses																					
7. Document the research process																					
• Determine if consensus was achieved																					
• Provide panel with summary of findings																					
• Determine directions for additional research																					
• Disseminate results and conclusions																					

Figure 1. Graphic Representation of a Sample Delphi Study Timeline

if deemed necessary. This multi-stage process of questionnaire circulation and controlled opinion feedback is continued until consensus is established. Most Delphi studies require between two and four rounds to gather a consensus of judgment, opinion, or choice. See Figure 1 for a graphic representation of a sample Delphi study time line.

While the Delphi Method has been endorsed for its adaptability and numerous variations are described in the literature, researchers must adhere to several basic guidelines in order to maintain an adequate measure of scientific rigor and to support the credibility of their research findings.²⁴ The following characteristics are recognized as critical components of the Delphi Method: 1) the reliance on the informed judgment of a carefully selected panel of experts; 2) utilization of multiple surveys; 3) asynchronous and anonymous participation of the Delphi panel members; 4) establishment of consensus through the reporting of feedback regarding the responses from the previous round; and 5) provision of direction and control to the research process by a Delphi manager.^{5,8,10,11,13}

Delphi Panel

The selection of panel members is considered to be a critical component of the Delphi process that is directly related to the focus or objectives of the investigation.^{11,13} Unlike other survey research methods that rely on randomized sampling techniques, the Delphi Method involves the purposeful sampling of a small group of participants upon whose expert opinions the results of the study are based.¹⁴ The identification and recruitment of these panelists is the most important step in the Delphi process and critics have raised methodological concerns regarding a number of areas including the definition of expertise, the potential for researcher bias in panel selection, and the possible overstating of results due to the use of the expert label.²⁴

In the interest of avoiding these methodological pitfalls, researchers should adhere to a stringent protocol for identifying the pool of available experts. Delphi panel members are usually identified through literature searches and recommendation from other recognized experts in the field.¹¹ It is strongly recommended, however, that the researcher adhere to a specific set of inclusion criteria, rather than mere personal preference when selecting

prospective experts to serve on the Delphi panel.^{5,22} Skulmoski et al.¹⁴ reported that the following criteria for establishing expertise have been recommended in the literature: 1) knowledge and practical experience regarding the area under investigation; 2) ability and willingness to participate in the study; 3) adequate time to contribute to the Delphi panel; and 4) effective communication skills. In compliance with these guidelines for panel selection a researcher must invest quite a bit of time in identifying experts that meet these criteria.

While considerable variation of opinion exists regarding the ideal size for a Delphi panel, the literature suggests that the panel should include at least 10 members²⁵ but little improvement in results can be expected as the panel increases beyond 25-30 members.^{26,27} Furthermore, it is not unusual for Delphi panels to include individuals with varying degrees of expertise in a particular area.¹³ A Delphi panel, for example, could consist of 15-20 individuals from a specific homogenous population and 5-10 individuals from a heterogeneous population with a different level of expertise and social/professional stratification⁶ who have displayed a high level of knowledge and practical engagement with the problems that are being studied⁵.

Questionnaire Design and Administration

The Delphi Method involves the circulation of three or four questionnaires consisting of a number of items regarding a specific topic of interest.¹³ Statements regarding the topic are generated based on the available literature and the initial opinions of a carefully selected panel of experts. Members of the panel are asked to respond to each statement in questionnaire form in accordance with their own personal knowledge and perceptions. The results of each round of anonymous questioning are summarized and shared with the intention that panel members reconsider those responses that deviate significantly from the group's overall mean ranking. Ziglio⁵ stated that "during this interactive process, which can be repeated as many times as are judged appropriate in the circumstances, issues can be clarified, areas of agreement and disagreement can be identified, and an understanding of the priorities can be developed".

The Delphi process traditionally incorporates two primary investigative phases.⁵ The exploration phase characterizes the first one or two rounds of questionnaire distribution where the issues being investigated are explored by the participating panel members. The evaluation phase involves all subsequent rounds of investigation for the purpose of evaluating the issues identified in the previous exploration phase. Throughout this interactive process, it is important to remember that various features of the research protocol, such as questionnaire design, the use of measurement scales, and the provision of feedback can influence the communication among panel members and the eventual outcome of the study. Accordingly, the survey instrument and administration must be subjected to rigorous pre-testing and the procedures for the provision of feedback should be carefully specified.²⁴

The Delphi Method's ultimate purpose is to facilitate in-depth conversation among a group of experts by providing them with opportunities to develop a more complete understanding of their peer's respective opinions, assessments, and forecast assumptions regarding a problematic issue.⁵ The precise methodology employed during a Delphi investigation may vary depending on the focus of the research.²³ This high degree of flexibility is inherent to the

Delphi Method because it enables researchers to focus and guide the communication process as it pertains to a wide array of problems, disciplines, levels of expertise, and so forth. The modified Delphi Method is one design variation that is particularly noteworthy. During a modified Delphi investigation, the researcher provides the panel members with an initial list of statements to be critiqued, and eliminates the traditional open-ended questionnaire which is generally used during the first round of surveying.¹⁶ The modified Delphi Method expedites the investigative process and enables the researcher to maintain strict control over the range and scope of the issues that are being discussed.

Asynchronous and Anonymous Participation

The asynchronous and anonymous participation of the panel members represents a defining characteristic of the Delphi Method. The asynchronous nature of the Delphi Method refers to each panel member's right to individually select the occasions when they will participate in the group communication process.⁵ The panel members may elect to only respond to those items of the problem that they feel best qualified to address.

The use of anonymous, sequential questionnaires is intended to facilitate the equal participation and involvement of all panel members. Anonymity eliminates numerous communication barriers that are inherent to face-to-face meetings, such as conflicting personalities, organizational hierarchy, political factors, presentation skills, and strong individual wills.¹⁰ The removal of these inhibiting variables enables each member of the group to contribute fully and truthfully with the knowledge that their ideas will be evaluated on the basis of merit rather than personality, reputation, or position.

While the value of anonymous participation remains central to the Delphi Method's success, it has been suggested that this anonymity "can cause participants to feel isolated and make it difficult for them to judge how best to formulate their ideas so that others will understand them".²⁸ A number of solutions have been recommended to prevent this communication barrier from occurring throughout the duration of a Delphi investigation. Team building techniques, straw model construction, and reduced participant anonymity have all been advocated as alternative methods for reducing participant isolation and enhancing in-depth conversation among panel members. For example, biographical sketches of each panel member can be shared prior to the initiation of the group communication process in order to provide the participants with a deeper understanding of the individuals with whom they will be interacting.

Supervision and Feedback

The provision of researcher-directed statistical group responses and feedback regarding each round of questioning represents another defining characteristic of the Delphi Method.¹⁶ Delphi panel members are required "to consider, to rank and/or rate, to edit, and to comment upon the responses developed during round one".¹⁶ The researcher then tabulates the results of each round of questioning and provides the panel members with the frequency distributions, means, and standard deviations for each item on the questionnaire. Additionally, a complete list of panel member comments could be provided with successive iterations.⁶ This cyclical process of questioning, reconsideration, and feedback is continued until a convergence of panel member responses takes place.¹⁶ It is

recommended that the researcher maintains and documents his or her supervisory decision-making by using a journal to capture key information about the Delphi process.¹⁴ The use of this type of research journal is an important step in documenting methodological rigor.

Given the methodological complexity of a Delphi study with its multiple rounds of survey design, data collection, data analysis, and information sharing it is critical that the researcher possess strong administrative skills.² The numerous administrative responsibilities of the researcher include developing a coding system for tracking respondents across multiple rounds, creating file systems for participant responses, and creating mailing databases and labels. With the small number of participants included in most Delphi studies, it is critical that the researcher administer the Delphi process in a manner that facilitates continued participation across multiple rounds. Poor response rates and the potential biases that they introduce are common in the final rounds of Delphi studies, so it is imperative that researchers operate in an efficient and effective manner that encourages participation until the process is completed.²⁴

Group Consensus

As previously discussed, the Delphi Method is useful for eliciting and combining expert judgments rather than factual information.¹¹ In many instances, the primary objective of the Delphi investigation is to establish some measure of consensus regarding the panel members' opinions.⁸ The reliance on small, non-representative samples associated with most Delphi investigations prohibits the utilization of inferential statistics.¹¹ Gordon¹¹ theorized that the true value of the Delphi Method concerns the generation of ideas rather than the determination of statistically significant results that can be generalized to a larger population.

Unfortunately, the literature provides little direction concerning the determination of consensus because there is no agreement regarding the designation of a minimum percentage of response needed to demonstrate consensus.¹⁶ Brooks²⁶ suggested a generalized definition of consensus as the "gathering of individual evaluations around a median response, with minimal divergence". Bulger & Housner²⁹ for example, conducted a Modified Delphi study to generate a consensus of expert judgment regarding the very important theoretical and applied exercise science competencies that pre-service physical educators need to learn within the undergraduate curriculum. The Delphi panel members were asked to rate each competency in terms of theoretical importance and pedagogical relevance using a 5-point Likert scale. Each item had to meet the following criteria for consensus in order to be included in the final list of recommended competencies. The item received a mean rating of at least 4 or higher in the areas of importance and relevance, and the item received at least 75% of all individual ratings at the 4 level or higher. Any item that failed to meet this criterion was considered not to be critical in nature.

Application of Delphi Method in Athletic Training

A search of the literature using databases (Table 1) indicated that there were very few studies in athletic training that have used the Delphi Method (Table 2). Only two published studies^{30,31} were found. The other remaining studies were either a dissertation³² or theses³³⁻³⁶. Increased expectation for evidence-based practice in the academic and clinical setting may stimulate additional use of the

Table 2. Use of the Delphi Method in Athletic Training

Study	Delphi Focus	Rounds	Outcome
Erickson & Martin ³⁰	Contributors to initial success on BOC exam perceived by candidate sponsors	3	Quantitative variables for predicting exam success
Weidner & Henning ³¹	Development of standards and criteria for selection, training, and evaluation of ACIs	3	Standards and criteria for selection, training, and evaluation of ACIs
Kutz ³² (Dissertation)	Determine leadership competencies necessary for AT practice and inclusion in different levels of ATEPs	2	Leadership development in AT
Andrews ³³ (Thesis)	Development of eating disorder policies and procedures for an NCAA Division I conference	2	Eating Disorder policies
Burmeister ³⁴ (Thesis)	Development of eating disorder policies and procedures for an NCAA Division III conference	2	Eating Disorder policies
Perez ³⁵ (Thesis)	Development of a Lower Quarter Screening Tool	2	Lower Quarter screening tool
Smrzley ³⁶ (Thesis)	Development of an Upper Quarter Screening Tool for Baseball	2	Upper Quarter screening tool

Delphi Method in athletic training. Since evidence based practice is in the developmental stages with athletic training, the problem solving process of the Delphi Method will be useful when there may be difficulty in making effective decisions in situations where there is contradictory or insufficient information. Furthermore, use of the Delphi Method is essential when the complexity or ambiguity associated with a particular problem exceeds the intellectual capabilities of a single decision-maker.^{6,8-10} This is important when the available information is relatively incomplete or multi-disciplinary in nature.⁶⁻⁸

The Delphi Method in athletic training has been used to fulfill two objectives; the need for evidence based practice and the need to establish policies and procedures when none are in existence or it is difficult for one individual to make a decision. Two of the theses (Perez³⁵ and Smrzley³⁶) established a thorough screening tool where none were in existence or incomplete information was available. After a thorough literature search, questionnaires were developed that included sections with evidence based and best clinical practice information. Perez³⁵ used a panel of lower quarter

experts (n=8) that have published or presented in this area, whereas Smrzley³⁶ used professional baseball athletic trainers and upper quarter researchers (n=19). Their final products both reflected a melding of best clinical practice and evidence-based for the upper and lower quarter.

What constitutes eating disorder policies and procedures are scarce in the literature and very few institutions have shared or published their policies and procedures. Since policies and procedures are based on resources available at each institution, and institutions in each conference are fairly comparable, each institution can serve as a panel of experts. Andrews³³ used both physicians and athletic trainers (n=28) to develop policies and procedures for a major Division I conference, whereas Burmeister³⁴ used only athletic trainers (n=8) in a Division III conference. Their final product produced an eating disorders policies and procedures document applicable only to their conferences.

Kutz,³² Weidner and Henning,³¹ and Erickson and Martin³⁰ utilized the Delphi Method to develop competencies, standards and criteria and qualitative variables, respectively where athletic training “research-based and peer-reviewed standards” are not in existence³¹. In post-professional athletic training programs, preparation for leadership roles is stressed. However, the athletic training literature is weak in identifying leadership competencies or content important for practice or for inclusion in athletic training education programs (ATEPs). Using the Delphi Method, Kutz³² used a randomly selected sample of 161 faculty and athletic training practitioners. Thirty-five leadership content areas were rated as important and were organized by three constructs; Managerial Leadership and Knowledge Management, Leadership Theories, and Leadership Issues, Trends, and Policies. Inclusion of leadership competencies increased in importance from the entry-level to the doctorate level. Weidner and Henning³¹ used all program directors of 2003 entry-level (n=183) CAAHEP-approved athletic training programs to develop standards and criteria for Clinical Instructor Educators (CIEs) to use as a selection, training and evaluation of Approved Clinical Instructors (ACIs). Of those randomly selected, 16 panelists developed 7 standards each with 3 to 13 criteria that were necessary, clear and appropriate for the selection, training and evaluation of ACIs. In contrast to developing competencies and standards, Erickson and Martin³⁰ sought to determine the factors that athletic training educators perceived as contributing to first-time success on the Board of Certification (BOC) exam. Using a sample of CAAHEP-accredited ATEPs approved before 1995 (n=35), 23 items were retained as contributing to passing all 3 sections of the BOC on the first attempt. They concluded that good grades are not the only contributing factors and that ATEPs should address these variables in their didactic and clinical instruction.

The field of athletic training is multi-factorial and multidisciplinary. On an every day basis, the clinical athletic trainer is being inundated with new research and clinical techniques. With limited free time to read every research study and clinical technique, the Delphi Method will allow clinicians and researchers to identify and prioritize the most relevant emergent issues and trends in athletic training. Included in Table 3 are additional research studies in athletic training that could be conducted using the Delphi Method.

Summary

The Delphi Method has been characterized as a highly

Table 3. Additional Research Studies in Athletic Training Using the Delphi Method

Academic	Clinical
Educational Trends in AT	Preparation of Entry-level ACIs
Standards and Guidelines	Advanced Clinical Certifications
Technology in Athletic Training	Development of Policies and Procedures
Orthopedic and Medical Issues	Best Clinical Practice and Evidence-based in Rehabilitation Core Stabilization Sensimotor Facilitation Plyometrics Gluteus Medius Strengthening Functional Rehabilitation Wrist and Hand Tendinopathies
Development of Competencies at the Master's and Doctoral Level	Injury Evaluation Patellofemoral Cold Urticaria Complex Regional Pain Syndrom Lumbar/SIJ Rotator Cuff
Burnout and Stress	Screening Instruments
Curriculum Development	Clinical Development and Assessment

flexible problem-solving process. This provides an opportunity for expert panel members to provide feedback by rating items and adding additional write-in comments to be used in the final development of evidence-based and best clinical practice, competencies, and standards and criteria. Since athletic training research-based and peer-reviewed standards are not in existence as there are for medical and other allied health fields, a research method needs to be implemented. Therefore, use of consensus methods, namely brainstorming, nominal group technique and the Delphi Method can be used. The Delphi Method in athletic training has been used to fulfill two objectives; the need for evidence based practice and the need to establish policies and procedures when none are in existence or it is difficult for one individual to make a decision. The Delphi Method and other consensus development methods should not be viewed as a scientific method for creating new knowledge, but rather as processes for making the best use of available information, be that scientific data or the collective wisdom of participants.

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