TEXAS DENTAL HYGIENISTS' INTEREST IN LOCAL ANESTHESIA LICENSURE

A THESIS

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I am submitting herewith a thesis written by Dana M. Thompson, entitled "Texas Dental Hygienists' Interest In Local Anesthesia Licensure." I have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirements for the Degree of Master of Science, with a major in Health Sciences Instruction.

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DEDICATION

This thesis is dedicated to the memory of a very caring and special friend whose presence is greatly missed: Paula Jonette Bilinski, April 22, 1948 - July 26, 1991.

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ABSTRACT

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The administration of local anesthesia by licensed dental hygienists is permitted in 15 of 51 jurisdictions in the United States, and Texas is not included among these 15 jurisdictions. The purpose of this study was to determine if Texas dental hygiensts have an interest in obtaining licensure in the administration of local anesthesia, and if their level of dental hygiene education was related to this interest. A systematic sample of 151 Texas dental hygienists was utilized in this study. Analysis of the data revealed that 96 of the 151 respondents had indicated an interest in local anesthesia licensure. One hundred-sixteen had obtained an associate degree, and 35 had obtained a baccalaureate degree. The final results of the study indicated that there was an interest among Texas hygienists in obtaining local anesthesia licensure, and that the level of interest was not related to the hygienists' dental hygiene educational level.

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CHAPTER I

Introduction

Periodontal disease is the leading cause of tooth loss of American adults, and the prevention and treatment of this disease are among the most significant functions performed by the dental hygienist (American Dental Hygienists' Association [ADHA], 1988). Subgingival scaling and root planing are two major functions performed by the practicing hygienist, and, in order for the patient to be comfortable or for the hygienist to perform these procedures thoroughly, the use of dental local anesthetics may be indicated (ADHA, 1991; Sisty-LePeau, Henderson, & Martin, 1986). The injected oral anesthetic used in dentistry today is one of the least toxic drugs given to patients for effective dental treatment, and its administration is performed by individuals who are adequately educated and licensed in the necessary sciences and techniques (ADHA, 1988).

The administration of local anesthesia by licensed dental hygienists is allowed in 15 of 51 jurisdictions in the United States (ADHA, 1991; Sisty-LePeau et al., 1986). Texas is not among these 15 jurisdictions. Research has established that dental hygienists can be taught to

administer local anesthesia at a satisfactory level of competency (ADHA, 1988). The ability to perform local anesthetic administration by dental hygienists has not only allowed the hygienists in 15 states to practice in an new and more effective manner, but also has brought about improvements in the quality of service these hygienists provide in both general and periodontal practices (Walsh, Hannebrink, Kerner, & Heckman, 1987). If the remaining 36 jurisdictions are to become more productive components of the dental health care system, dental hygienists must have an interest in obtaining local anesthesia licensure, and must engage in the political action necessary to achieve this goal (Odrich, 1982).

Statement of the Problem

The problem of this study was to survey a systematically selected sample of Texas dental hygienists regarding their level of interest in obtaining local anesthesia licensure.

Purpose of the Study

The purpose of this study was to determine the level of interest in performing the administration of local anesthesia in the state of Texas by Texas dental hygienists and to determine if the level of dental hygiene education was related to this interest.

Hypothesis

The following null hypothesis was tested at the .05 level of significance:

1. There is no significant difference between Texas dental hygienists who have earned an associate degree or certificate and those who earned a baccalaureate degree in terms of their levels of interest in administering local anesthesia.

Research Question

The following research question was used to assist this study:

1. Will at least 30% of the respondents indicate an interest in obtaining licensure in the administration of local anesthesia?

Definition of Terms

The following terms are defined for the purpose of this study:

1. Associate Degree/Certificate Dental Hygienist. A registered dental hygienist who has not earned a bachelor's degree in dental hygiene.

2. Baccalaureate Degree Dental Hygienist. A registered dental hygienist who has earned a bachelor's degree in dental hygiene from a college or university.

3. Licensure. The credentialing mechanism or process by which an agency of the government grants permission to persons meeting the predetermined qualifications to engage in a given occupation (Woodall, 1987).

Delimitations

This study was delimited by the following:

1. The study involved a cross-sectional survey conducted in the Spring of 1992 at Texas Woman's University.

2. The sample used was drawn from the population of registered dental hygienists in the state of Texas by systematic sampling.

3. The study was limited to registered Texas dental hygienists.

Limitations

This study was limited by the following:

1. The interest levels of Texas dental hygienists are measureable.

2. The hygienists honestly answered the questionnaire that was designed for this study.

3. There was no control over the proportion of hygienists who had earned an associate degree/certificate in dental hygiene compared to those who had earned a baccalaureate degree in dental hygiene.

Justification

The ability for dental hygienists to perform expanded functions lies within the rules and regulations of every states' dental practice act (Boyer & Nielsen, 1984). Those 15 states in which dental hygienists are allowed to perform local anesthesia administration have seen not only an increase in the recognition and treatment of the periodontally involved patient, but also an increase in the accessibility to care for these patients (Deuben, Sumner, & Johns, 1980).

If the dental hygienists in the remaining 36 jurisdictions are to become more involved in treating periodontal disease, there must be an interest in obtaining local anesthesia licensure, and there must be active

participation in changing the rules and regulations restricting this procedure. The results of this study can provide the Texas Dental Hygienists' Association with information they need to decide on the merits of changing the current status of local anesthesia administration for dental hygienists in the state of Texas.

CHAPTER II

Review of Literature

This review of literature focuses on six areas. The first two areas define dental hygienists and local anesthesia. The third area discusses the legal administration of local anesthesia by dental hygienists. The fourth area focuses on the advantages of hygienists administering local anesthesia, the fifth area discusses the educational preparation for local anesthesia administration, and the final area discusses the future trends in dental hygiene.

Dental Hygienists

The registered dental hygienist, by definition, is a licensed professional, oral health educator, and clinical operator who provides preventive, educational, and therapeutic methods for the control of oral diseases to aid individuals in attaining and maintaining optimum oral health (Wilkens, 1983). Another definition describes the hygienist as being a preventive specialist who exercises clinical judgement in choosing and implementing preventive modalities

under the direct, indirect, or general supervision of a licensed dental practioner (Gurenlian & Gluch-Scranton, 1986; Sisty-LePeau, Boyer, & Lutjen, 1990).

In 1906, Dr. Alfred C. Fones established the practice of dental hygiene by training Irene Newman to be a provider of care to his dental patients (Woodall, 1987). In 1913, the Fones School of Dental Hygiene at the University of Bridgeport in Connecticut was founded to educate the dental hygienist to perform preventive oral health services (Wilkens, 1983; Woodall, 1987). In 1916, the American Dental Association approved licensure for dental hygienists, and in 1917, states began licensing hygienists, with Connecticut the first state to approve licensure, and Texas the last in 1951 (Benicewicz & Metzger, 1989; Tate, Schirling-Wilkes, & Frese, 1987).

Traditional reversible functions accomplished by the dental hygienist include: Performing the oral prophylaxis, exposing and processing of radiographic surveys, applying topical anticariogenic agents, taking health histories, oral charting, dietary counseling, and giving oral hygiene instruction (Douglass & Cole, 1979; Farrugia, 1984; Minervini, Harrington, & Stindt, 1981). In 1972, the American Dental Association recommended that the dental hygienist be educated to perform services in addition to the traditional ones because "research had demonstrated that

auxiliaries could be taught to perform certain functions with competence and without loss of quality in the delivery of dental care" (McCloskey, 1977, p. 693).

Such nontraditional, advanced skills, or expanded functions include: Placing rubber dams; taking impressions for study casts; placing, carving, and finishing restorations; applying and removing sutures and dressings; applying topical anesthetics; performing periodontal therapy, such as subgingival scaling and root planing; and administering nitrous oxide/oxygen analgesia and dental local anesthetics (McCloskey, 1977; Rich & Smorang, 1984; Sisty-LePeau et al., 1986).

Periodontal disease is the leading cause of tooth loss among adults in the United States and population trends indicate that there will be a demand for periodontal care in the coming decades (Schroder, 1988; Woodall, 1987). Research indicates that conservative periodontal therapies are effective in managing certain types of periodontal disease (Sisty-LePeau et al., 1986). As a result, hygienists frequently perform presurgical scaling and root planing in moderate to advanced periodontal pockets, and it is thought that the quality of these services depends on effective pain control (Sisty-LePeau et al., 1986).

Local Anesthesia

Local anesthesia is defined as a loss of sensation in a circumscribed area of the body caused by depression of excitation of nerve endings or an inhibition of the conduction process in peripheral nerves (Malamed, 1986). The most important feature of local anesthesia is that it produces the loss of sensation without inducing the loss of consciousness (Malamed, 1986). Local anesthetics are the most frequently used drugs in dentistry, and their main purpose is to prevent pain that may occur during dental procedures (ADHA, 1988). Dental local anesthetics are administered in three ways: Topical application, which is applied to surface tissue; local infiltration, which is injected and affects the immediate area near the injection site; and by nerve block, which is injected and affects the nerve and the area of its influence (ADHA, 1988).

Deuben, Sumner, and Johns (1980) suggested that if the functions of the hygienist are expanded in the recognition and treatment of the periodontal patient, hygienists should be given the authority to administer local anesthesia necessitated by these procedures. Currently, 15 states allow the administration of local anesthesia by dental hygienists (ADHA, 1991; Pattison & Waidman, 1987). Pattison stated that in California, "the expansion of functions has allowed the hygienist to practice more effectively, and that

the administration of local anesthesia by dental hygienists has brought about significant improvements in the quality of dental hygiene and periodontal services in both general and periodontal practices" (Pattison, 1985, p. 72). Pattison and Waidman (1987) also stated that with the delegation of expanded functions, there has been a great improvement in the recognition skills for periodontal disease, because hygienists are routinely probing and performing thorough periodontal examinations (Pattison & Waidman, 1987).

In a study conducted at the University of Iowa by Sisty-LePeau and associates (1986), 48 expanded function dental hygiene students were taught to administer nerve block and infiltration dental anesthesia as part of an 11-month expanded curriculum experiment. A total of 3,926 dental injections were evaluated by dental faculty, and of these, 95.44% were evaluated as providing adequate anesthesia (Sisty-LePeau et al., 1986). In a similar study conducted by Lobene, Berman, Chaisson, Karelas, and Nolan (1974), attempts for infiltration procedures by licensed hygienists were reported to be successful in 96.7% of the cases, and block procedures were reported as successful in 85.7% of the cases. In this study, the total time needed for acquisition of the skills required for clinical work was 13 weeks (Lobene et al., 1974). The results of these

studies indicate that dental hygienists can be taught to administer local anesthesia successfully in a relatively short period of time (Sisty-LePeau et al., 1986).

Legal Administration of Local Anesthesia by Dental Hygienists

Although dental hygienists may need to use local anesthesia for some procedures, the most recent survey of legal provisions indicates that only 15 of 51 jurisdictions allow this function (ADHA, 1991; Sisty-LePeau et al., 1986). These jurisdictions, which are primarily in the western region, include: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Missouri, Montana, Nevada, New Mexico, Oklahoma, Oregon, Utah, Washington, and Wyoming (ADHA, 1991).

Since hygienists must be taught these functions, some states limit what a hygienist can learn based upon current state law rather than upon the full scope of functions acceptable in other states (Woodall, 1987). The legality of performing expanded functions is identified by the dental practice acts of each state (Boyer & Nielsen, 1984). The purpose of practice acts are to provide for eligibility for licensure, and control the assignment of duties to other personnel (Tate et al., 1987). Practice acts also dictate

the formation of a state dental board whose functions are to interpret and administer the practice act (Tate et al., 1987).

The state dental boards generally consist of practicing dentists, dental hygienists, and dental consumers, but will vary from state to state. Recently the Texas State Board of Dental Examiners [TSBDE] added two dental hygienists to its board which had previously consisted of nine practicing dentists and three members of the general public (TSBDE, 1989). There is no state that has a state board that has dental hygienists as the majority of its members.

The purposes of licensure are to protect the public's general interest, to establish practice standards, and to protect the interest of the profession by prohibiting the practice of the unlicensed and the incompetent (Tate et al., 1987). The level of supervision required for hygienists to provide specific functions also is controlled by the rules and regulations established by the state boards of dentistry (Sisty-LèPeau et al., 1990).

The different levels of supervision accepted by the American Dental Association include: Personal supervision, in which the dentist has authorized the auxiliary to assist in the treatment by concurrently performing a supportive procedure while the dentist is personally operating on the patient; direct supervision in which the dentist is in the

dental office or treatment facility and personally diagnosed the condition to be treated, and personally authorized the procedure to the auxiliary and remains in the dental office while the procedure is being performed; and general supervision in which the licensed dentist has the responsibility for the function performed by the auxiliary, but is not necessarily present in the office (Sisty-LePeau et al., 1990). Overall, direct supervision is the most common supervision provision delegated to the hygienist for the nontraditional or expanded functions performed by the dental hygienist (Sisty-LePeau et al., 1990).

Advantages of Hygienists Administering Local Anesthesia

The American Dental Hygienists' Association suggests that with the use of the expanded function auxiliaries, there is an increase in dental productivity, job satisfaction, quality of services delivered, and accessibility to care (ADHA, 1988). In a study conducted by Milgrom, Bergner, Chapko, Conrad, and Skalabrin (1983), 126 Washington State dentists were surveyed regarding the delegation of expanded functions among auxiliaries in the general practice setting. The results of the study indicated that net dental productivity was increased from 16 to 81% in practices that delegated expanded functions extensively (Milgrom et al., 1983). The findings also

indicated an increase in job satisfaction, for the dentists and the hygienists, at high levels of delegation, and an increase in quality of services that were delivered, such as: More complete patient records, better preparation for emergencies, less use of cold sterilization, and better quality radiographs (Milgrom et al., 1983). In a study conducted by McKenzie and Born (1973), 2,200 dentists were surveyed assessing their attitudes toward expanded function auxiliaries (McKenzie & Born, 1973). The results of the study revealed that 93% of the respondents indicated that more time was available for the more complex procedures which only the dentist is qualified to perform (McKenzie & Born, 1973). Lobene and associates (1974) suggest that with the use of advanced skills or expanded function auxiliaries, more patients can be treated by the same number of dentists and hygienists, and therefore rendering more dental care to the public (Lobene et al., 1974).

Job satisfaction often refers to the mental and emotional relationship between an individual's abilities, job requirements, and reinforcers present in the work environment (Lawson & Martinoff, 1980). The ability to perform additional procedures not only increases the variety and interest of the job, but also the feeling of accomplishment (Lawson & Martinoff, 1980; Woodall, 1987).

Lawson and Martinoff (1980) found that hygienists with expanded function training are more satisfied with their positions, and they benefit from an increase in professional recognition, autonomy, and career mobility (Farrugia, 1984; Gurenlian & Gluch-Scranton, 1986, Woodall, 1987). The reasons for dissatisfaction among hygienists who are not trained in expanded functions include: Lack of variety in the position, underutilization or limitations created by laws, and the lack of professional advancement (Miller, 1991). Lawson and Martinoff also suggested that to increase job satisfaction, dental hygienists should be trained and licensed in expanded functions (Lawson & Martinoff, 1980).

Educational Preparation for Local Anesthesia Administration

Regardless of education and/or experience, all dental hygienists are expected to perform the traditional functions for which they are trained (Gurenlian & Gluch-Scranton, 1986). Baccalaureate graduates are trained to perform the same clinical services as associate degree/certificate hygienists, but research has indicated that the baccalaureate graduates tend to express a stronger desire for expanded functions and increased opportunities for career advancement (Benicewicz & Metzger, 1989). Deuben and associates (1980) state that training for the administration of local anesthesia could be included in the baccalaureate

and associate/certificate dental hygiene curricula and through programs of continuing education. Instruction in the administration of local anesthesia include such topics as the anatomical, physiological, and pharmacological aspects of anesthesia, patient health evaluation, the recognition and management of emergencies, and the actual techniques of administering local anesthesia (ADHA, 1988).

Future Trends in Dental Hygiene Licensure

In order for dental hygienists to become licensed in expanded functions, state legislatures and their respective boards of dentistry must first alter or remove restrictions that have been placed in the rules and regulations regarding the practice of dental hygiene (ADHA, 1988). The state legislature always maintains the right to establish new practice parameters for professions (Schroder, 1988). New rules may be promulgated by the board of dentistry based on the scope of the rulemaking authority given to the board by the legislature (Schroder, 1988). A succussful legislative proposal would include background information on local anesthesia, current dental hygiene usage of it, the need for hygienists to administer it, safety, and the potential benefits for its use (Schroder, 1988).

Summary

In summary, the dental profession, in previous years, has encouraged dental hygienists to further their roles in the dental office to meet the growing needs for the delivery of services in a more effective manner (Marinelli, Waldman, & Peterson, 1982). Studies have demonstrated that dental hygienists can be educated to perform functions which extend beyond their traditional roles (ADHA, 1988; Deuben, Zullo, & Sumner, 1981). The dental hygienist who is highly skilled in periodontal examinations, local anesthesia administration, and subgingival scaling and root planing, is a powerful weapon against active periodontal disease (Pattison, 1985).

CHAPTER III

The methodology of this study is discussed in relation to its population, procedures used to sample the population, procedures used to collect the data, instrument used to measure the variables, and statistical techniques that were used to treat the data.

Population and Sample

An investigator-designed survey was developed and mailed to 200 registered Texas dental hygienists who were systematically selected from an alphabetical listing that was purchased from the Texas State Board of Dental Examiners. The method of systematic selection included: Counting from the alphabetical listing all of the registered hygienists residing in Texas (N=5641); dividing the number by 200; and using the resulting number (28) to determine the frequency of selection of subjects from the listing. Every twenty-eighth subject was then consecutively assigned an identification code number until 200 subjects had been chosen.

Procedures

The instrument that was designed for this study was pilot-tested for content validity by 11 individuals engaged in the fields of higher education, dental hygiene, and dentistry. The purpose of the pilot-test was to determine if the questionnaire that was designed for this study required any changes or improvements prior to the initial mailing. The method of pilot-testing included: Mailing, on March 9, 1992, a copy of the questionnaire with a self-addressed stamped envelope to the 11 individuals; adding space on the second page of the questionnaire for any comments and/or suggestions; and requesting its return by March 14, 1992. All of the questionnaires were returned by the due date.

Several items on the questionnaire were reworded based on recommendations resulting from the pilot test. The revised questionnaire was mailed March 26, 1992 to the 200 Texas hygienists, and its initial date of return was April 10, 1992. The contents of the initial survey included: A cover letter explaining the purpose of the study, the reason for respondent anonymity, and the due date indicating the survey's anticipated date of return; the questionnaire; and a self-addressed stamped envelope for its return. Of the 200 subjects originally receiving the questionnaire, 56.5%

(n=113) answered the questionnaire by the initial due date, 1.5% (n=3) returned the questionnaire unanswered, and 42.0% (n=84) did not return the questionnaire.

The survey was coded by placing the corresponding consecutive number that was assigned to each subjects name on the top left corner of the second page. This code was to indicate to the investigator who had participated in the study for follow-up purposes.

A follow-up letter was mailed to 84 hygienists on April 13, 1992, two weeks following the initial mailing, for those hygienists who had not responded by the initial due date. The contents of the follow-up letter included: A cover letter explaining the need for respondent participation, and the due date indicating the survey's anticipated date of return; the questionnaire; and a self-addressed stamped envelope for its return. Twenty-four responded to the follow-up mailing; however, 14 questionnaires from the initial mailing were returned during the follow-up period for a total of 38 responses. The final date for the follow-up letters return was April 22, 1992. The overall reponse for both the initial and follow-up mailings revealed a 75.5% (N=151) response rate for those returned answered, 1.5% (n=3) for those returned unanswered, and 23.0% (n=46) unreturned.

Instrument

The instrument for this questionnaire was constructed by the investigator due to the lack of existing instruments appropriate for this study. Items on the instrument were separated into two sections. The first section included five questions regarding general information such as: Gender, employment status, and educational level. The other section included 11 items regarding periodontal disease and dental hygienists interest in administering local anesthesia to treat this condition. A section for comments was also provided in the initial and follow-up survey for those hygienists who cared to express their opinions.

The instrument was scored in the first section by placing a numerical value (1, 2, or 3) associated with the number of responses that were available (e.g. Gender: 1=Female, 2=Male). The second section was rated on a Likert scale from 1 to 7 (Strongly Agree to Strongly Disagree) in the questionnaire therefore, no added numerical value was needed.

Treatment of the Data

The hypothesis for this study was tested at the .05 alpha level of significance due to the size of the sampling population. The data was analyzed using descriptive analysis, *t* test, chi-square, and factor analysis to interpret the results of this study.

CHAPTER IV

The findings of this study are discussed in relation to the statistical techniques that were used to interpret the data that were collected. Descriptive, t test, chi-square, and factor analyses were used to determine the results of this study. The hypothesis was tested at the .05 alpha level of significance due to the size of the sampling population.

Two hundred systematically selected Texas dental hygienists were surveyed to assess their interest in obtaining local anesthesia licensure. The response rate of the investigator-designed survey revealed that 75.5% (N=151) responded to the survey within the initial and follow-up period, 1.5% (n=3) were returned unanswered, and 23.0% (n=46) were unreturned.

The questionnaire that was designed for this study included 16 items that were divided into two sections. The first section included five items that measured the demographic characteristics of the population such as: Gender, employment status, and educational level. The

final section included 11 items that were in regard to the hygienists' interest in obtaining local anesthesia licensure.

In Table 1, chi-square analysis was used to describe the demographic characteristics of the sample in relation to the response rate. The results of the chi-square analysis revealed that of the 151 respondents who participated in this study, 99.3% (n=150) were female, and .7% (n=1) were male. One hundred-sixteen (76.8%) respondents had obtained an associate degree/certificate in dental hygiene, and 35 (23.2%) had obtained a baccalaureate degree in dental hygiene. Table 1 also indicates those hygienists who were or were not currently practicing and documents their employment status as being either full-time or part-time. The discrepancy that exists among the items identifying the respondents current practicing status, was the result of one respondent inconsistently answering items 2 and 3 of the first section of the questionnaire, and therefore the statistical results of these items were dissimilar.

Table 1

Demographic Characteristics of the Sample

Characteristic	Percentage (%)	Number (N)
Gender:		
Female	99.3	150
Male	.7	1
Currently Practicing:		
Yes	80.1	121
No	19.9	30
Employment Status:		
Full-time	48.3	73
Part-time	31.1	47
Not practicing	20.5	31
Level of Education:		
Assoc./Cert.	76.8	116
Baccalaureate	23.2	35

Question 4 of the first section of the questionnaire was an open-ended question regarding the number of years the respondent had practiced as a dental hygienist. In Table 2,

the minimum number of years was .75, and the maximum was 40.0. The average number of years of practice of the 151 respondents indicated a mean score of 11.35.

Table 2

Number of Years of Dental Hygiene Practice

Variable	Min	Max	Mean	Median
Number of Years of Practice	.75	40.0	11.35	10.0

Note. N=151; SD=7.39; SE=.60

The final 11 items on the questionnaire were rated on a Likert scale from 1 to 7 (Strongly Agree to Strongly Disagree). Item 5 was in regard to the hygienists interest in obtaining local anesthesia licensure, and therefore was the only question that was tested for significance in relation to the hygienists dental hygiene educational level.

The following null hypothesis was tested at the .05 alpha level of significance:

1. There is no significant difference between Texas dental hygienists who have earned an associate degree or

certificate to those who earned a baccalaureate degree in terms of their levels of interest in administering local anesthesia.

A chi-square analysis comparing the hygienists dental hygiene educational level and their response to item 5 is presented in Table 3. However, for the purposes of identifying the responses that were either positive, neutral, or negative, the seven point Likert scale rating was collapsed into three, thereby combining the positive responses; the neutral; and the negative responses. The results of this chi-square analysis revealed that of the 116 hygienists who had earned an associate degree/certificate in dental hygiene, 62.1% (n=72) were interested in obtaining local anesthesia licensure, 15.5% (n=18) were neutral for licensure, and 22.4% (n=26) were against licensure. Similarly, the hygienists who had earned a baccalaureate degree in dental hygiene (n=35) indicated a 68.6% (n=24) interest for licensure, 8.6% (n=3) were neutral for licensure, and 22.9% (n=8) were against licensure.

Table 3

Column and Total Percentages of Educational Level by Interest in Licensure

	Assoc./Cert.	Baccalaureate	Total
Strongly Agree, Moderately Agree, Agree	62.1% (n=72)	68.6% (n=24)	63.6% (n=96)
Neutral	15.5% (n=18)	8.6% (n=3)	13.9% (n=21)
Disagree, Moderately Disagree, Strongly Disagree	22.4% (n=26)	22.9% (n=8)	22.5% (n=34)
Total	100% (n=116)	100% (n=35)	100% (N=151)

Note. Phi=.086; significance=.57; N=151

The chi-square value for this test was .086 and the level of significance was .57, indicating that there was no significant difference between the associate/certificate

degree dental hygienist and the baccalaureate degree dental hygienist in terms of their interest in obtaining local anesthesia licensure. The null hypothesis for this study was not rejected at the .05 alpha level of significance.

A *t* test analysis (Table 4) was also conducted to test Hypothesis 1. In this test the dental hygiene educational level (independent variable) and the hygienists response to item 5 (dependent variable) resulted in a *t* value of .36 and a .72 level of significance, indicating that this test did not reject the null hypothesis either.

Table 4

T Test of Educational Level by Interest in Licensure

Variable	*N*	Mean	*SD*	*SE*
Assoc./Cert.	116	2.91	2.00	.19
Baccalaureate	35	2.77	2.16	.36

Note. *t* value=.36; df=149; significance=.718

The following research question was used to assist this study:

1. Will at least 30% of the respondents indicate an interest in obtaining licensure in the administration of local anesthesia?

In Table 3, 96 of the respondents answered positively to item 5, indicating that 63.6% of the total respondents (N=151) expressed an interest in obtaining licensure in the administration of local anesthesia, and therefore answering the research question for this study in the affirmative. The hygienists were also given the opportunity to express their opinion regarding this topic on the final page of the questionnaire. Fifty-four of the 151 respondents responded to the comments section. Of the 54 hygienists who responded, 42 (77.8%) expressed a positive statement regarding local anesthesia license, and 12 (22.2%) expressed a negative statement (see Appendix D for comments).

A factor analysis failed to reveal any significant results in relation to how the respondents answered the questionnaire, and was excluded from this study; however, Table 5 expresses the overall response to item 5 of the final section of the questionnaire by the associate/certificate and baccalaureate hygienists. The

original 1-7 Likert scale was not collapsed in Table 5 for the purpose of distinguishing between the responses that ranged from Strongly Agree to Strongly Disagree.

Table 5

Responses/Attitudes Toward Item 5 of Questionnaire

Item 5	Assoc./Cert.		Baccalaureate		Row Total	
	(%)	(N)	(%)	(N)	(%)	(N)
SA	29.8	45	9.3	14	39.1	59
MA	9.9	15	6.0	9	15.9	24
A	7.9	12	.7	1	8.6	13
Neutral	11.9	18	2.0	3	13.9	21
D	7.9	12	2.0	3	9.9	15
MD	2.0	3	.0	0	2.0	3
SD	7.3	11	3.3	5	10.6	16
Column Total	76.8	116	23.2	35	100.0	151

The responses to the final section of the questionnaire are presented in Table 6. The purpose for including this table was to further identify the attitudes of the respondents in relation to their interest in local anesthesia licensure.

Table 6

Response to Remaining Items of Questionnaire

Item		SA	MA	A	N	D	MD	SD	Tot.
1	(%)	37.7	18.5	27.8	7.3	6.0	2.0	.7	100
	(N)	57	28	42	11	9	3	1	151
2	(%)	56.3	19.2	11.3	4.6	5.3	1.3	2.0	100
	(N)	85	29	17	7	8	2	3	151
3	(%)	48.3	13.2	11.9	9.9	8.6	.7	7.3	100
	(N)	73	20	18	15	13	1	11	151
4	(%)	41.1	17.9	11.9	13.9	9.3	1.3	4.6	100
	(N)	62	27	18	21	14	2	7	151
5	(%)	39.1	15.9	8.6	13.9	9.9	2.0	10.6	100
	(N)	59	24	13	21	15	3	16	151
6	(%)	43.7	12.6	11.9	11.9	7.3	2.6	9.9	100
	(N)	66	19	18	18	11	4	15	151

Table 6 cont.

Response to Remaining Items of Questionnaire

Item		SA	MA	A	N	D	MD	SD	Tot.
7	(%)	46.4	11.3	17.9	13.2	4.0	2.0	5.3	100
	(N)	70	17	27	20	6	3	8	151
8	(%)	42.4	13.9	15.2	15.2	4.0	1.3	7.9	100
	(N)	64	21	23	23	6	2	12	151
9	(%)	11.9	7.3	20.5	31.1	11.3	4.6	13.2	100
	(N)	18	11	31	47	17	7	20	151
10	(%)	23.2	18.5	12.6	19.9	11.9	4.0	9.9	100
	(N)	35	28	19	30	18	6	15	151
11	(%)	45.0	9.3	18.5	11.3	4.6	2.6	8.6	100
	(N)	68	14	28	17	7	4	13	151

The statistical techniques that were used to interpret the findings of this study proved to be sufficient in analyzing the results of this study. Descriptive, chi-square, and t test were used to answer both Hypothesis 1 and

the research question. A factor analysis failed to reveal any significant information and was excluded from this study. The null hypothesis was not rejected at the .05 alpha level of significance. However, the research question revealed a high level of positive interest among respondents toward local anesthesia licensure for Texas hygienists.

CHAPTER V

The final results of this study are discussed in the following four areas. The first area summarizes the purpose, methodology, and findings of this research. The second area discusses the conclusions that were made based upon the results of this study. The third area discusses implications as to the significance of the results of this research, and the final area offers recommendations for further research relating to this study.

Summary

The purpose of this study was to determine the level of interest in performing the administration of local anesthesia in the state of Texas by Texas dental hygienists, and to determine if the level of dental hygiene education was related to this interest. An investigator-designed 16 item survey was developed and mailed to 200 systematically selected Texas dental hygienists. The response rate, after the initial and follow-up mailing, revealed that 75.5% (N=151) of the subjects responded to the questionnaire, 1.5% (n=3) returned the questionnaire unanswered, and 23.0% (n=46) did not return the questionnaire.

Descriptive, chi-square, and t test analyses were used to analyze the data. Descriptive analysis was used to describe the demographic characteristics of the sample. The results indicated that of the 151 respondents who participated in this study, 76.8% (n=116) had obtained an associate degree/certificate in dental hygiene, and 23.2% (n=35) had obtained a baccalaureate degree in dental hygiene. One hundred-fifty respondents (99.3%) were female and 1 (.7%) were male. The minimum number of years of practice was .75 and the maximum was 40.0. The average number of years of practice indicated a mean score of 11.35.

Conclusions

The following null hypothesis was tested at the .05 alpha level of significance:

1. There is no significant difference between Texas dental hygienists who have earned an associate degree or certificate to those who earned a baccalaureate degree in terms of their levels of interest in administering local anesthesia.

A chi-square analysis comparing the hygienists dental hygiene educational level and their interest in obtaining local anesthesia licensure was also conducted. The results revealed that of the 116 hygienists who had earned an associate degree/certificate in dental hygiene, 62.1% (n=72)

were interested in local anesthesia licensure, 15.5% (n=18) were neutral for licensure, and 22.4% (n=26) were against licensure. The baccalaureate degree hygienists (n=35) expressed a 68.6% (n=24) interest for licensure, 8.6% (n=3) were neutral for licensure, and 22.9% (n=8) were against licensure. The level of significance for this test was .57, indicating that there was no significant difference between the associate degree/certificate and baccalaureate degree dental hygienists' interest in obtaining local anesthesia licensure. The null hypothesis for this study was not rejected at the .05 alpha level of significance. A t test was also conducted to test Hypothesis 1. The results of the test revealed a .72 level of significance, indicating that the hypothsis, again, was not rejected.

The following research question was used to assist this study: Will at least 30% of the respondents indicate an interest in obtaining licensure in the administration of local anesthesia? Descriptive analysis revealed that 63.6% (n=96) of the total respondents (N=151) had indicated an interest in local anesthesia licensure.

Implications

The results of this study indicated that there is an interest among Texas dental hygienists in obtaining licensure in the administration of local anesthesia, and

that this interest was not influenced by the hygienists' educational level. The results can also provide the Texas Dental Hygienists' Association with information they may need to pursue legislative change for the administration of local anesthesia by dental hygienists in the state of Texas.

Recommendations

Based on the findings of this study, the following recommendations for future research are:

1. Replication of this study assessing Texas dentists' attitudes toward hygienists administering local anesthesia.

2. Replication of this study assessing the dental patients' attitude toward the dental hygienist administering local anesthesia.

3. Replication of this study in the remaining 36 jurisdictions that do not allow local anesthesia administration by dental hygienists.

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APPENDICES

Appendix A

Cover Letter for Initial Mailing of Questionnaire

DANA M. THOMPSON, RDH
256 East Corporate Drive #1317
Lewisville, Texas 75067

Dear Hygienist,

I am a practicing dental hygienist and graduate student working on my Master's thesis at the Texas Woman's University in Denton, Texas. I am currently conducting research to assess the interest levels of Texas hygienists in obtaining licensure in the administration of local anesthesia, and you are one of the hygienists in this state who is being asked to participate in this study. Your opinion is of great value to me and to this study, and could be a factor influencing the future of expanded functions for hygienists in this state.

Enclosed is a short questionnaire that I am asking you to complete as part of this study. The questions are very easy to answer and should not take more than 10 minutes of your time. There are no right or wrong answers, and to assure anonymity, please do not place your name on the questionnaire or the enclosed, self-addressed, stamped envelope that is to be mailed to me.

Since a limited number of these questionnaires are being sent to selected hygienists in this state, your participation is very important to the success of this study. I therefore ask that you please complete and return this questionnaire, in the envelope provided, by April 10, 1992. Your time is greatly appreciated, and if you have any questions regarding this study, please feel free to contact me at the above address.

Thank you,

Dana M. Thompson, RDH

Appendix B

Initial and Follow-up Questionnaire

Questionnaire

1. Gender:
   ___Female ___Male

2. Are you currently practicing as a dental hygienist?
   ___Yes ___No

3. Indicate your employment status as a practicing dental hygienist.
   ___Full-time ___Part-time ___Not currently practicing

4. How long have/had you worked as a dental hygienist?
   _____

5. What level of dental hygiene education have you achieved?
   ___ Associate degree/Certificate in dental hygiene
   ___ Baccalaureate degree with major in dental hygiene

Please circle the degree to which you agree with each of the following statements.
1 = Strongly Agree
2 = Moderately Agree
3 = Agree
4 = Neutral
5 = Disagree
6 = Moderately Disagree
7 = Strongly Disagree

1. The role of the dental hygienist is being expanded primarily in the identification and treatment of the periodontally involved patient.
   1 2 3 4 5 6 7

2. When treating the periodontally involved patient, through deep subgingival scaling, effective pain control, such as the use of dental local anesthesia, is generally indicated.
   1 2 3 4 5 6 7

3. Fifteen states currently allow dental hygienists to practice the administration of dental local anesthesia. Texas dental hygienists should also have the ability to be trained and licensed in performing this function.
   1 2 3 4 5 6 7

4. Texas dental hygienists are being underutilized in performing effective dental hygiene treatment as compared to these 15 states.
   1 2 3 4 5 6 7

Please circle the degree to which you agree with each of the following statements.

1 = Strongly Agree
2 = Moderately Agree
3 = Agree
4 = Neutral
5 = Disagree
6 = Moderately Disagree
7 = Strongly Disagree

5. I would be interested in obtaining local anesthesia licensure.
   1 2 3 4 5 6 7

6. If given the opportunity to be trained and licensed in the administration of dental local anesthesia, through a course of continuing education, I would be interested in such a course.
   1 2 3 4 5 6 7

7. If local anesthesia is added to permissible duties for Texas dental hygienists, the examination for this procedure should be administered by the Texas State Board of Dental Examiners.
   1 2 3 4 5 6 7

8. The Texas Dental Hygienists' Association should pursue this change in the Texas Dental Practice Act.
   1 2 3 4 5 6 7

9. I would provide some of my personal time to help the Texas Dental Hygienists' Association and the Hygiene Political Action Committee (HYPAC) to lobby for this change in the practice act.
   1 2 3 4 5 6 7

10. The <u>benefits</u> of dental hygienists administering local anesthesia <u>outweigh</u> the <u>risks</u> of performing this function.
   1 2 3 4 5 6 7

11. The administration of local anesthesia by dental hygienists should be considered in this state.
   1 2 3 4 5 6 7

Please indicate any comments regarding this questionnaire in the remaining space provided or the reverse of this page.

Appendix C

Cover Letter for Follow-up Mailing of Questionnaire

DANA M. THOMPSON, RDH
256 East Corporate Drive #1317
Lewisville, Texas 75067

Dear Hygienist,

Recently you were mailed a questionnaire concerning a study that I am conducting for my Master's thesis at the Texas Woman's University regarding Texas dental hygienists' interest in obtaining local anesthesia licensure, and I have not yet received your response.

Since your opinion is important in obtaining the results for this survey, I have enclosed another questionnaire and self-addressed stamped envelope, and would appreciate your reply by April 22, 1992.

Thank you,

Dana M. Thompson, RDH

Appendix D

Comments to Questionnaire

Positive Comments

"I have been licensed for local anesthesia, nitrous oxide/oxygen sedation and subgingival curettage in California since 1978. I believe that I could be much more effective in my dental hygiene practice in Texas if I could utilize these skills here. I am certain that the dentists in Texas would find it a real asset to utilize a hygienist with expanded functions if they gave it a try. In California, a hygienist without expanded functions is unlikely to find any employment outside of pedo practice".

"A change such as this would have been necessary for me to have continued practicing dental hygiene. In the past two years I have pursued my masters degree in another field that will allow me to better utilize my talents. I think the State of Texas, and the people of Texas will continue to lose the best of the hygiene professionals unless they make some rapid and meaningful changes to the practice act".

"The State of Texas is not and never has utilized the dental hygienist to their fullest capacity. I'm definately in favor of this and any more extended duties for the hygienist. Count me in on everything".

"I have moved here from another State in which I'm licensed and was able to give anesthesia. I find it rather disturbing that moving across the Texas line makes me incompetent and unable to administer anesthesia".

"Very good questionnaire! I have wondered for some time now why the administration of local anesthesia has not been changed in the Texas Dental Practice Act. I think dentists are afraid of giving us too much 'power' in the office. If they would only realize how much we'd be helping them out by getting their next patient numb while they finished up on their patient".

"In my opinion, the only way hygienists should be licensed to provide local anesthesia is if the continueing education course is a very in depth (longer than a weekend) course and the exam for this procedure should be administered by the Texas State Board of Dental Examiners. I am concerned that there are many dental hygienists who will not be qualified to provide local anesthesia just as there are many who inadequately provide periodontal therapy".

"Good luck!. I have prayed and hoped and cussed and been stressed out due to this subject".

"I do believe a hygienist could be better utilized if licensed to administer anesthesia. However, I do believe there are risks. I am not sure I, myself, am ready to take these risks. The dental profession is now required to take extra special precautions in order to reduce the risks of AIDS in the dental setting and rightfully so. At this time in my professional career, I do not feel I would want to take on another responsibility. That is not to say I would not be in favor of legislation allowing this nor does it mean that I would not want this added skill in the future. This is just a personal feeling and I believe such training could only benefit our profession".

"Unfortunately I will probably never practice dental hygiene again, since I really do not enjoy it at all anymore. Therefore I doubt that I would lobby for any changes, but I wish you the best. Interestingly enough, the main reason I became disenchanted was due to the fact that we hygienists were so oppressed by the dentists. I hated it and I quit. To hell with them".

"Now that we have two hygienists on the TSBDE and a reasonable amount of clout through DH advisory council, local anesthesia is a good emphasis for the near future".

"I would not mind being trained under the dentist or through a continueing education course for this procedure. Right now, I am disappointed in how professional hygienists are being treated by all dentists. We deserve a big paid raise with such a dangerous job. We do everything for the dentist as it is. This would be one more thing as a hygienist we would have to do instead of the dentist. I feel more like a [expletive deleted] being inferior to the dentist. We need to stick together and fight on this issue. If I knew then what I know now, I would never have become a dental hygienist. As my boss said to me 'we as dentists run a prophy mill'. Dentists do not give us benefits nor health insurance. They do not care about us. All they care about is how much production (money a day) they can get out of us. If I sound hurt and angry, you are absolutely right".

"I love the thought of being able to give injections, but at the same time it scares me. I remember in one course at school the Dr. said most lawsuits involved injections. This has stuck in my mind. He probably said it to keep any of us form pushing for something like this. Was his statement true? Do most lawsuits againist dentists involve injections"?

"It's about time this issue was addressed"!

"I currently hold a certificate to administer local anesthesia in the State of Oklahoma. I was naturally disappointed to learn that I would not be able to perform this function when I relocated to Texas. I would most definitely be 're-educated' if necessary to perform a function that can save time and make a hygienist a more valuable member of a dental team. I wish State laws did not vary so much from State to State. I moved from what I consider a very progressive State where dental hygiene is concerned, to a State where I can do little more than clean teeth".

"I believe certification should be automatic with license if certified by a dental hygiene school, as are sealants. I do not think hygienists should be examined for a procedure if D.D.S.'s are not".

"I have a very poor opinion of the TSBDE being a 'good ole boy' agency. I recently had the pleasure to listen to Dr. Glenda Smith, of the board, and my faith is somewhat restored, but, I still feel it will always be the D.D.S.'s vs. the R.D.H.'s. Good luck in bringing about any changes. I won't hold my breath".

"When I was practicing, the dentist would come in and administer anesthesia as needed. In order to save time, I would be interested in administering anesthesia to individual teeth (infiltration) as needed, but I would not at this time want to do a block (anesthesia of an entire quadrant). Now did that confuse the issue"?!

"If pit and fissure sealant placement isn't on the TSBDE board, local anesthesia shouldn't be either".

"We need to consider how many of us would be able to attend dental hygiene courses to be able to perform this added function, and the locale of these schools".

"It would seem that testing by course administration should be sufficient to assure that local anesthesia can be safely administered".

"I think with proper training, this is a very positive step in patient care".

"Good luck on your Masters. This is a good subject for your thesis. Get your survey published".

"I can't offer much volunteer time".

"Most hygienists do not mind giving time to well structured lobbying. Too many times 'others' are trying to push other items through as 'riders' on top of important issues like this. That is where these issues lose their momentum".

"If the continueing education course is approved by the TSDB, why should there be another exam by the TSDB"?

"I'm not sure how I feel about making it mandatory for everyone to take the course. I took a 2 day course on local anesthesia. I feel if you were to pass this practice act, the course should be longer".

"There is enough pressure and stress taking the dental boards without making local anesthesia another State test. However in Oregon, after you take the class, you then give 20 injections with dental supervision".

"I feel that an examination for licensure in local anesthesia could be given by the board of dental examiners, but could also be given by a doctor in a continueing education course that the board has accepted".

"I am both a dental hygienist and dental student presently giving local anesthesia in school. However, I will answer the questions as though I am only a hygienist. I agree if the hygienists are properly trained, the benefits outweigh the risks".

"Question number 4 assumes that the hygienist is being utilized to the maximum. The general practioner does not give the R.D.H. the opportunity to spend adequate time with the patient".

"I have not looked into or asked about the courses obtained by a D.D.S. for administering local anesthesia. I feel it would take more than a continueing education course. Wouldn't it? However, I would be interested in taking it".

"From years of watching the Dr. administer anesthesia for my perio patients, it seems quite simple. It is a waste of my time and the patients to wait on him to administer it".

"Good luck with your thesis! I hope this will help you achieve you goals, as well as possibly playing a role in allowing hygienists in this State to move up one more notch".

"In the practice I work in there is aggressive periodontal treatment by dental hygienists. The ability for hygienists to administer local anesthsia would facilitate a smooth and quicker appointment for the patient. Also, all four of the D.D.S.'s in my practice are in favor of hygienists administering local anesthesia".

"Please continue to pursue this research. I feel obtaining licensure in the administration of local anesthesia would be an overwhelming benefit for Texas dental hygienists, not only for those who treat the periodontally involved patient, but those who work in pediatric dentistry also".

"I am semi-retired, therefore, I would not pursue this for myself, but feel any expanded duties like this a positive step forward, with proper education and examination".

"It is nice to see someone is addressing this issue! Good Luck"!

"I am more interested in doing infiltration instead of the full responsibility of blocks".

"I practiced local anesthesia in Oregon. It was a step backward when I received my license in Texas".

"I favor supervision by the dentist. These are his patients".

"Outstanding questionnaire!! Hopefully one of these days the dentists in this State will recognize the benefits of having a hygienist who could actually be something other than a 'brainless prophy queen'. I think the Texas State Board needs to revitalize its members and start anew".

"Thank God somebody finally has the sense to pursue research such as this. My very best to you, and I wish you great success".

Negative Comments

"I do not think the dentists of Texas would ever pay a hygienist enough to cover liability insurance that performing such a task would need. It is a nice idea and all, but why keep adding more training with no insurance or more pay"!

"Do the benefits outweigh the risks? This is questionable, therefore, I chose to remain neutral at this time, being fearful of medical malpractice lawsuits".

"I don't think this would improve our professional status or be a financial gain. It would just be an added duty that we would not get paid for. The Texas dentists are very defensive toward hygienists according to the rule changes to direct supervision. Sometimes it is best to let well enough alone".

"The liability would be too great and the hygienists would be taken advantage of by the dentists who would request hygienists to do their patients without extra compensation".

"Administering local anesthesia would put even more added responsibilities on the hygienist. The legal aspects alone. Undue and unnecessary lawsuits could wipe out a hygienist and her family".

"I feel expanded duties for the hygienist in Texas would benefit the dentist even more than anyone else. This

would allow the option of starting work of the periodontally involved patient faster instead of having to wait for anesthetic and using valuable appointment time".

"I think if the State Board allows dental hygienists to administer local anesthesia, it should be by personal choice of the hygienist. I personally do not want to be responsible or liable for administering local anesthesia".

"I do not believe we (R.D.H.'s) should give anesthesia. I don't want the pressure, conflict, malpractice, etc. If I did then I'd be a dentist! If I wanted to do more procedures than I do now, I'd move to another state".

"There are many areas that need to be looked into before we pursue local anesthesia. One major concern is that of malpractice insurance to cover this. Also, what type of supervision are we looking at? I have been involved in many areas of continueing education for hygienists, and before we try to change duties for hygienists, full courses need to be outlined in length of courses etc. Local anesthesia courses need to be longer than 1 or 2 days. Local anesthesia is not something to be taken lightly. There are many risks involved in adminstering anesthesia. I have been involved in a very progressive perio office.

While local anesthesia would be helpful at times, I feel that it will be misused more often than not, and feel that a lot of study needs to go into this".

"With the supervision of the dentist being indirect, I feel that it would be risky to perform local anesthesia when the Dr. is not in. I have worked for only 3 dentists and none were very interested in patient education, especially with the perio patient. What a shame! I'm tired of convincing 'till I'm blue in the face".

"Though there are many well trained hygienists, I have seen much evidence of many who cannot adequately clean teeth. Why would you turn them loose with a syringe? Even if the hygienist is well trained, it just takes the patient one more step away from the dentist who is supposed to be the major care taker of the patient. Administering the anesthesia gives the dentist one more opportunity to see the patient and monitor any problems the hygienist is not trained to recognize. Hygiene training does not provide the adequate background to diagnose and manage a patient especially if a problem arises, such as allergic reactions. If a hygienist wants to practice dentistry then they should go back to school for another four years".

"If I really felt that the Texas State Board of Dentistry cared about the treatment of periodontal disease by the dental hygienist, I would agree with this concept. The oppression of Texas hygienists by the Texas State Board is a disgrace to both professions. When I start seeing changes, I will start agreeing with the need for added duties".