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**Characterization of the Practice and Attitudes of Genetic
Counselors with Doctoral Degrees**

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Abstract

Potential advantages and disadvantages of doctoral training in genetic counseling have been debated in recent years. In this study, interviews were conducted to characterize the practice of genetic counselors with doctoral degrees. Respondents were significantly more likely to spend time in research and less likely to spend time in clinic than genetic counselors in general. Advantages identified by respondents were consistent with theorized advantages, and included increased knowledge, wider research roles, additional opportunities and greater respect. Disadvantages identified by respondents focused more on individual perspectives than previously theorized profession-wide disadvantages. These included increased time commitment and decreased patient contact. The attitudes of participants towards the development of doctoral training in genetic counseling were generally positive. The results suggest that doctoral training in genetic counseling would have more benefits than drawbacks. The development of programs leading to this degree is one way to address concerns about the future of the profession.

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Introduction

Since its beginnings in 1969, the field of genetic counseling has grown steadily its presence in the medical community with the addition of diverse roles and responsibilities. (Walker et al., 1990). Genetic counselors work in a variety of specialties and the scope of professional practice has expanded from strictly clinical focus to including expanded roles in research, teaching, and other areas. The 2000 and 2002 Professional Status Surveys, however, highlight concerns about the future of the profession (Farmer and Chittmas, 2000; Parrott et al., 2002). These surveys found that 21% and 17% of respondents, respectively, were considering leaving the profession. The areas in which the highest levels of dissatisfaction were expressed related to earning potential, opportunities for advancement, respect from the medical community and burnout. It is clear from the professional status survey data that such issues need to be addressed if the field is going to continue to grow.

One possible way to address some of these stated concerns is the development of a doctoral degree pathway in genetic counseling (Scott et al., 1988; Walker et al., 1990; Gaupman et al., 1991; Biesecker, 1998). At the annual National Society of Genetic Counselors (NSGC) educational conference in 1989 potential benefits and drawbacks of such a degree were proposed (Walker et al., 1990). Advantages included advancement opportunity, specifically through acquisition of faculty appointments and research skills, greater credibility in the academic setting, and intellectual stimulation. Walker's report also proposed possible disadvantages of such a degree including devaluation of the master's degree, creating a division between theory and practice in genetic counseling,

and increasing the shortage of genetic counselors who are available to perform clinical work.

The current gold standard and terminal degree in the genetic counseling profession is the master's degree. In a 1991 survey, 54.4% of master's-trained genetic counselors supported the creation of a doctoral degree in genetic counseling (Gaupman et al., 1991). Additionally, 43.7% of respondents were interested in pursuing this degree themselves. Counselors who were interested in pursuing this degree identified possible advantages including greater professional recognition, ability to specialize, and greater knowledge base. In a more recent study, 2.5% of master's trained counselors were currently pursuing an advanced degree and 24.4% reported that they planned to enroll in an advanced degree program in the future (Clark et al., 2003). Clark's study found that 34.1% of participants were interested in pursuing a PhD in genetic counseling if it became available. The most common reasons given for their desire to obtain this degree were personal fulfillment and career advancement. These studies clearly showed that there is strong interest in this type of degree and further outline the possible advantages of creating doctoral training tracks specifically in genetic counseling.

We can learn from the experience of other allied health fields which have moved from offering the terminal master's degree training only to also offering doctoral level training. Studies in the fields of pharmacy, audiology, and nursing have explored the impact of the creation of a doctoral degree on the field as well as the individual, and described the role of doctorally prepared professionals in these fields.

In pharmacy, one study compared the differences in role and job satisfaction between pharmacists with a BS and pharmacists with a PharmD (Cox and Carroll, 1988).

The two groups spent similar amounts of time doing the same work and, contrary to predictions, there were no differences in job satisfaction (Cox and Carroll, 1988). A more recent study, however, found that PharmDs spent more time on clinical and educational activities than BS trained pharmacists (Fjortoft, 1995). This study also found that PharmDs had greater job satisfaction and were more committed to the profession. These two studies indicate that, with time, the role and differences between the two degrees in the field of pharmacy have evolved and become more distinct.

A study of audiologists holding a PhD found that the majority spent at least part of their time in research (Malinoff and Spivak, 1991). However, the average time spent conducting research was only 20% while the average time spent on clinical duties was 30%. While all of those studied had obtained a research degree, 70% felt that this degree had adequately prepared them for their current job. This study highlights that a traditional research PhD can prepare allied health professionals for research and non-research careers.

In nursing, a 2001 study of doctoral program alumni found that nursing doctoral training had a positive impact on career development, scholarly productivity, and professional leadership (Sakalys et al., 2001). The study further found that doctorally trained nurses were working in many different capacities including teaching, research, administration, and professional service. Sterling and McNally (1999) used qualitative interviews to describe the experiences of doctorally trained nurses working in clinical practice. The nurses in this study identified respect from the medical community and equality in partnerships as being a characteristic of their practice. Nurses with doctoral training described themselves as having more leadership roles, greater access to faculty

appointments, and a wider knowledge of research. Overall this study found that abilities gained and increased status were the most commonly described advantages. All of these studies in other allied health fields suggest that the theoretical advantages to doctoral training that have been proposed in genetic counseling are observed in other health care fields.

To date, the only option for genetic counselors interested in education beyond the master's degree has been to obtain a PhD in another field. Approximately 3% of the genetic counselors who compose the NSGC members already have a doctoral degree (Farmer and Chittmas, 2000; Parrott et al., 2002). There is little information, however, about the experiences of these individuals in the field of genetic counseling. While clearly the experience of someone with a doctoral degree in another field will likely be somewhat different from that of someone with a doctoral degree in genetic counseling, this group of genetic counselors can provide valuable first-hand perspectives about the advantages and disadvantages of doctoral training. Determining the role that these counselors play and the relationship of an advanced degree to the career of a genetic counselor is an important first step in evaluating the role of a doctoral degree in genetic counseling.

The goals of this study were to describe the practice of genetic counselors with doctoral degrees and determine the influence the doctoral degree has had on their careers. Through structured interviews, participants were encouraged to describe the professional advantages and disadvantages of having a doctoral degree, the influence the doctoral degree has had on their job satisfaction and career advancement, and their perspectives related to the development of a doctoral degree in genetic counseling.

Methods

Study Design and Participants

Approval for this study was obtained from the University of Cincinnati institutional review board. Potential participants were identified through the 2002-2003 National Society of Genetic Counselors Membership Directory. Full members and emeritus members of the NSGC who were listed as holding a doctoral degree in any field and who resided within the United States or Canada were included. Doctoral degrees held by potential participants included PhD, DNSc, DrPH, and DPH. Student and associate members of the NSGC and those members who hold a professional degree such as an MD or JD were excluded. One person was excluded because she helped develop the questionnaire. The group included 60 potential participants.

Potential participants were contacted first with an introductory email notifying them they would be contacted by telephone (Appendix A). The email also gave the opportunity to decline participation and suggest a contact time. None of the potential participants declined to be contacted. Participants were contacted by phone a minimum of 5 times at different times during the work week. A follow-up email was sent inviting those who had not been reached to ascertain a time that would be best to reach them. Of the 60 potential participants, 11(18.3%) could not be contacted due to inaccuracies or changes in their contact information. Seventeen (28.3%) were never reached by telephone. One participant declined to participate when reached by phone (1.7%). The questionnaire was completed by 31/60 (51.7%) of potential participants.

Instrumentation

A questionnaire was developed for use in the telephone interview (Appendix A). The questionnaire included both open-ended and closed-ended questions. Close-ended questions addressed the participant demographic characteristics of age, gender, years in current position, degrees held, and job title. These questions were formatted based on those in the 2000 Professional Status Survey. Open-ended questions addressed topics such as the participant's typical day, impact of the doctoral degree on the participant's career, the advantages and disadvantages of the PhD, and attitudes toward a PhD in genetic counseling. The questionnaire was reviewed and edited by two genetic counselors with master's degrees, one genetic counselor with a doctoral degree, a qualitative research expert, and a biology professor.

Data Collection

All 31 telephone interviews were conducted by C.S. between March and July of 2003. Each interview lasted approximately 15-25 minutes and was audiotaped. Verbal consent to participate was obtained from each participant and was documented by the interviewer. All responses were transcribed verbatim with names and references to places of employment removed.

Data Analysis

Transcribed responses were analyzed by C.S. using an inductive analysis method. Indigenous themes were identified through comparison of the responses. *Foliovie*, a text management program, was used to facilitate the analysis by allowing careful

organization and coding of the data. Once themes were identified, the de-identified responses were reviewed with R.B.P. and the themes were discussed and agreed upon. Descriptive statistics were used to summarize the close-ended questions and chi square analysis was used to compare responses to the 2000 Professional Status Survey data. A comparison to the more recent 2002 Professional Status Survey was not possible due to changes in data format between question development and analysis. Significance was set at $p < .05$.

Results

Respondents to this study included 25 (80.6%) females and 6 (19.4%) males. The proportion of males was significantly greater in this group than the field in general based on data from the 2000 Professional Status Survey ($p < .01$). The average age of the participants was 45.6 years (range 30-65). The distribution of participants' ages was significantly different from the distribution of ages in the 2000 Professional Status Survey with genetic counselors holding doctoral degrees tending to be older ($p < .01$). The average time spent in their current job was 8.7 years (range 8 months-30 years). The distribution of years spent in current position was also significantly different between this group and the field in general ($p < .01$). Genetic counselors with doctoral degrees tended to have had their position longer. All participants had obtained a doctoral degree and 28 (90.3%) had obtained an additional master's degree. It was not ascertained in what field the master's degree was obtained in. The master's degree was the first graduate degree obtained by 18 (58.1%) of the participants and the doctoral degree was the first advanced degree obtained by 10 (32.3%) of the participants.

Participants in this study obtained doctoral degrees in many fields. The most common doctoral field was genetics (including human genetics, molecular genetics, and medical genetics) with 18 (58.1%) holding their doctorate in these areas. Another 9 (29%) participants had a doctoral degree in other health or science disciplines. Participants reported holding diverse job titles. Thirteen (41.9%) respondents' job titles included a faculty position. This is significantly different ($p < .05$) than the 25% of genetic counselors who have a faculty appointment (Farmer and Chittmas, 2000). Eleven (35.5%) respondents included genetic counselor as part of their job title. Providing direct

client genetic counseling services was a part of the jobs of 20 (64.5%) of the participants. Participants described many work activities. The distribution time spent in clinical work, research, teaching and administrative activities is outlined and compared to the 2000 Professional Status Survey participants (Table 1).

The following sections outline the themes identified as a response to each open-ended question. The themes are outlined in tables as indicated. N indicates the number of genetic counselors who answered that question. The quotes illustrate some of the responses given and are generally representative of the range of responses. Quote sources are identified by study accession number.

Why did you decide to go on to get a master's degree after getting your doctoral degree?

Participants who had obtained a doctoral degree before getting a master's degree (N=10) were asked this question and the responses resulted in 2 themes (Table 2).

Changing careers (10/10): A desire to move from a previous field into genetic counseling was a commonly stated reason for wanting to get a master's degree. The reason for this transition that was most often given was a desire to interact more directly with patients.

Always intended to go on (1/10): One participant also stated that they had planned to get a master's degree in genetic counseling after finishing a doctoral degree in another area. This counselor indicated s/he would have rather pursued the master's in genetic counseling if s/he had known about it earlier.

Why did you decide to go on to get a doctoral degree after getting your master's degree?

Participants who obtained their doctoral degree after receiving a master's degree (N=18) were asked this question and the responses resulted in 3 themes (Table 3).

Desire to do Research (7/18): Participants stated that the doctoral degree was necessary for conducting certain research projects. Some participants wanted primarily research careers which required a PhD. Others wanted to gain further research skills in order to have greater control over the design and implementation of their research studies.

Additional Opportunities (7/18): Participants stated that they would have more freedom in the job market and a greater variety of career options by achieving a doctoral degree.

Always intended to go on (3/18): Achievement of a doctoral degree was a long standing career goal.

Do you feel that your practice differs from that of a typical genetic counselor?

All participants who indicated that providing genetic counseling was one of their job responsibilities (N=21) were asked this question. The responses resulted in 6 themes (Table 4).

No Differences (8/21): Participants stated that their practice was essentially the same as a genetic counselor with a master's degree only.

Perform Research (7/21): Participants stated that they consider themselves to

have enhanced research roles compared to master's trained genetic counselors. This includes the ability to be the primary investigator on research projects and perform more bench research with a doctoral degree.

More Autonomy (4/21): Respondents consider themselves to have more freedom and independence than other genetic counselors including more control over their schedule and the ability to practice and bill independently.

Less Patient Contact (2/21): Participants stated that they do not counsel patients in clinic as often as master's trained genetic counselors.

Perform Administrative Roles (2/21): Respondents consider themselves to have greater directorial responsibilities than the typical genetic counselor.

What do you feel are the advantages and disadvantages of having a doctoral degree?

All participants stated that, overall, their doctoral degree had a positive impact on their career. All participants were asked to define what they felt were the specific advantages and specific disadvantages of having a doctoral degree. The responses regarding advantages resulted in 6 themes (Table 5). The responses regarding disadvantages resulted in 5 themes (Table 6).

Advantages

Greater Knowledge and Skills (18/31): Obtaining doctoral training provided the participant with a better comprehension of topics they commonly encounter or provided them with the skills necessary to do their job.

Perform Research (17/31): Gaining doctoral training provided participants with

the skills to do research and allowed them to obtain employment in research positions. The degree also allows them to apply for grants as the principal investigator and have more control over their research projects.

Additional Opportunities (15/31): Doctoral training opened doors for the participants by providing a wider range of employment options. It also allowed respondents to gain greater employment responsibilities and authority.

Greater Respect and Recognition (11/31): Having a doctoral degree has generated more respect from colleagues and patients and gives the participant more credibility.

Tenure Eligibility (5/31): Having a doctoral degree allowed the participant to qualify for tenured faculty positions.

Greater Autonomy (5/31): Having a doctoral degree provides the participant with more independence in their work, including the ability to bill for services.

Disadvantages

No Disadvantages (15/31): Many participants did not feel that there were any negative aspects to their doctoral degree.

Increased Time/Work (8/31): Obtaining a doctoral degree involves a commitment of time and effort. Additionally, working in a career that requires a doctoral degree often results in an increased workload.

MD would have been better (4/31): A medical degree instead of or in addition to the doctoral degree would have been a better option because it would allow more freedom in billing and in clinical practice.

Decreased Patient Contact (2/31): Having a doctoral degree creates other responsibilities that reduce the opportunity to provide direct patients counseling.

Decreased Opportunities (2/31): Some employers may feel that an individual with a doctoral degree is overqualified for a typical genetic counseling job.

Do you feel that having a doctoral degree has affected your level of satisfaction in your current position?

This question was asked to all participants and resulted in 6 themes which were divided into 3 groups (Table 7).

Positive Impact:

Job Requirement/Additional Opportunities (12/31): The participants are very satisfied with their current position, which they could not have obtained without a doctoral degree. In addition, their ability to take on more responsibility and become involved in additional projects has improved job satisfaction.

Research Skills (6/31): Satisfaction with their current position is directly related to taking on greater research roles due to the research experience and skills gained when obtaining the doctoral degree.

Greater Respect and Recognition (5/31): Having a doctoral degree has resulted in an increase in esteem and credibility from colleagues and clients.

Greater Knowledge and Skills (2/31): Participants feel more capable in their current jobs because of the knowledge gained through doctoral training.

No Impact (6/31):

Having a doctorate did not affect job satisfaction.

Negative Impact (3/31)

Working in a traditional genetic counseling position has led to a drop in status from a previous position or has resulted in unwanted expectations that they will do more work and have more responsibilities than other counselors.

Do you feel that having a doctoral degree has affected your opportunities for advancement?

This question resulted in 5 themes (Table 8).

Tenure Eligibility (9/30): Opportunities to obtain faculty appointments were possible because of the doctoral degree.

Unspecified Positive Impact (7/30): Having a doctoral degree provided opportunities for advancement, but no specific examples or areas were offered in the interview.

Additional Opportunities (5/30): Participants stated that they had more employment options and responsibilities in their current position.

Research Skills (2/30): Doctoral training has allowed participants to be more involved in research and have wider research knowledge.

No Impact (7/30): Obtaining a doctoral degree has not affected the participants' opportunities for advancement.

In your opinion, does having a doctoral degree impact how you are perceived by other genetic counselors?

This question resulted in 3 themes (Table 9).

No Impact (12/31): Participants do not feel that they are perceived differently by other genetic counselors.

Negative Impact (4/31): Respondents stated that a small number of genetic counselors have a negative impression about genetic counselors that have doctoral degrees.

Perceived as More Knowledgeable (3/31): Other genetic counselors may see the participant as having more knowledge in the area of their doctoral training.

In your opinion, does having a doctoral degree impact how you are perceived by other health care professionals?

This question resulted in 3 themes (Table 10).

Greater Respect and Recognition (21/29): Physicians and other health professionals relate to genetic counselors with a doctorate as having more credibility and deserving of greater respect.

Additional Opportunities (4/29): Participants were considered more readily for certain jobs or promotions because they had more advanced training or because they were considered more independent.

Negative Impact (1/29): Concern was expressed that a genetic counselor with a doctoral degree would not fit in or would be restless because they might be considered overqualified for certain employment opportunities.

Do you feel that the development of a PhD in genetic counseling would have a positive, negative, or neutral impact on the field of genetic counseling?

This question resulted in 8 themes, divided into three groups (Table 11).

Positive Impact (26/31)

Research PhD (16/31): Providing the opportunity for genetic counselors to obtain more training in research through a PhD would be positive for the field of genetic counseling because it would help to build the field's literature and would be beneficial for individuals who were interested in performing research.

Opportunity to gain additional knowledge (8/31): Genetic counselors who obtained a PhD would be able to expand their genetics knowledge or would be able to specialize in a particular area.

Move Profession Forward (7/31): The field of genetic counseling would achieve more respect and gain credibility if doctoral training was an option. In order for the profession to continue to grow and be viewed as a legitimate health field, advanced training needs to be available.

Additional Opportunities (6/31): Obtaining a PhD would allow a counselor to qualify for a wider range of positions and make faculty positions and administrative positions easier to achieve.

Greater Respect for Genetic Counselors (5/31): Individuals working in the field would receive more regard and credibility in the medical and scientific community if they had a PhD in genetic counseling.

Neutral Impact/Undecided (14/31)

Depends on Curriculum (10/31): It is unclear what impact the development of a

doctoral degree in genetic counseling would have on the field or on individuals because the program of study is undefined.

No Benefit (9/31): A PhD is not necessary to provide genetic counseling clinical service, and the creation of such a degree would have no impact on the field in general. There is no specific role for a doctorally trained genetic counselor.

Negative Impact (5/31)

Minimize Opportunities for Master's Counselors (5/31): Training genetic counselors at the doctoral level will decrease positions for master's trained counselors and will result in the PhD becoming the entry level degree.

Discussion

The creation of a doctoral degree in genetic counseling is a possible way to address concerns about the future of the field as highlighted in the recent professional status surveys (Farmer and Chittmas, 2000; Parrott et al., 2002). Additionally, discussions of the possible impact and potential interest in a doctoral degree have been considered repeatedly within the field (Scott et al., 1988; Walker et al., 1990; Gaupman et al., 1991; Biesecker et al., 1998; Clark et al., 2003). This study provides a better understanding of the practice of genetic counselors who currently have doctoral degrees in other fields and outlines what these counselors have found to be the benefits and drawbacks of doctoral training from their first-hand experience.

The Practice of Genetic Counselors with Doctoral Degrees

Genetic counselors with doctoral degrees were older than the general population of genetic counselors, which would be expected considering the additional time commitment required to obtain a doctoral degree. They were also found to have held their current positions longer than genetic counselors in general. While this could be related to age, it could also be related to differences in job satisfaction or advancement opportunity. However, this cannot be clarified from the present data.

The comparison between the work activities of the genetic counselors with doctoral degrees and the broader group of all genetic counselors highlights interesting similarities and differences. Genetic counselors with doctoral degrees are less likely to be working in a clinical setting and more likely to be doing research. This result is not unexpected since the PhD is generally a research degree. The benefits of a PhD when

working in research are further highlighted by the qualitative data. Opportunity to acquire research skills was identified as a stated advantage and one reason that participants chose to pursue a doctoral degree. In addition, the most frequently cited benefit of developing doctoral training in genetic counseling was the chance to provide broader research training to genetic counselors and broaden the field's research base. Clearly, the enhanced ability and opportunity to do research is one of the most important characteristics of the training and practice of genetic counselors with doctoral degrees working in the field of genetic counseling. This is important considering that a review of job postings in the field of genetic counseling from March to August of 2003 found that 37/102 (36%) positions listed research as a job responsibility. Also, a recent study of research practices among master's trained genetic counselors found that the largest group of counselors (46.6%) spend 0% of their time in research while 59.3% would like to be spending 25% of their time in this area (Clark et al., 2003). Doctoral training is one way to address the need and desire for genetic counselors to have research skills.

Another surprising finding related to work activities is that genetic counselors with doctoral degrees were no more likely to spend time in teaching than genetic counselors in general. This is particularly interesting considering that the genetic counselors with doctoral degrees in this study were significantly more likely to hold faculty positions. However, it is not clear in either group whether these teaching responsibilities are in the academic setting, community settings, or both. In any case, the data suggests that genetic counselors who do not have doctoral degrees are more likely to have teaching responsibilities that are not within a faculty appointment. This is consistent with the opinions expressed by genetic counselors with doctoral degrees who

feel that the ability to obtain tenure more easily is an advantage of having a doctoral degree.

Advantages and Disadvantages of Doctoral Training

The theoretical advantages and disadvantages of a doctoral degree in the field of genetic counseling that have been postulated addressed both individual issues and those related to the field in general (Walker et al., 1990). The experiences of counselors described in this study focused on the individual benefits and drawbacks of doctoral degrees. Increased opportunities for advancement through faculty positions and research skills were not only theorized in the literature, but also correspond to several of the main areas of dissatisfaction in the field, including both lack of opportunities and burnout (Walker et al., 1990; Farmer and Chittmas, 2000; Parrott et al., 2002). In addition, another frequently identified advantage to the individual of doctoral training was an increase in respect. Although participants did not feel that having a doctoral degree changed how they were viewed by other genetic counselors, they generally experienced an increase in respect from physicians and other healthcare professionals. Again, a lack of respect was an area of concern highlighted by those leaving the field (Farmer and Chittmas, 2000; Parrott et al., 2002). Other advantages not previously theorized including increased knowledge and greater autonomy, both related to the personal experience of having this advanced degree.

The participants' focus on individual experience was also demonstrated in the perceived disadvantages that were described. Increased time and work commitment, decreased patient contact, and fewer opportunities in certain areas are important

considerations. However, these are personal considerations and may not be seen as universal disadvantages. In fact, all participants stated that the advantages of doctoral degree achievement far out-weighed the disadvantages.

The previously theorized disadvantages of a doctoral degree in genetic counseling were not similarly noted by our study participants. These disadvantages, including a devaluing of the master's degree, a division between the practice and research in the field, and a diversion of counselors from clinical practice, generally pertain to the field and not the individual (Walker et al., 1990). However, several of our study participants identified a minimization of the role of master's trained counselors as a potential drawback of a doctoral degree in genetic counseling. The potential for doctorally trained genetic counselors to compete with, and perhaps overshadow, the master's trained counselors was a stated concern.

Attitudes of the participants regarding the development of a doctoral degree specifically in the field of genetic counseling were positive. This is consistent with a recent study indicating that more than a third of master's trained counselors expressed interest in this degree (Clark et al., 2003). Genetic counselors who hold a PhD feel that the development of an advanced degree would broaden the research base, and secure the profession's place as integral in the field of genetics. The PhD would also benefit the individual by providing him or her with a wider base of knowledge in research or another specialty area and foster greater respect and more opportunities. Many participants felt that this degree would not benefit a counselor who was working strictly in a clinical setting, but that with the expanding roles of genetic counselors there would be a place for doctorally trained counselors. Clearly defining the separate, yet interconnected, roles of

master's and doctorally trained counselors will be important to prevent replacement of the master's degree by the doctoral degree. Therefore, as many participants acknowledged, the curricula and requirements for such programs must be carefully discussed and defined by academic institutions, the NSGC, and the ABGC.

Study Limitations

There are several limitations to this study. The participants held doctoral degrees in many fields and had taken many different paths to obtain their doctoral training. The doctoral training that was obtained in other fields varied by individual and in its pertinence to their career as a genetic counselor. Therefore, their experiences related to having doctoral training and working in this field will likely differ in some ways from the experience of someone who was to obtain a PhD in genetic counseling specifically. However, the fact that the responses correspond so closely with theorized benefits and drawbacks, the observations in other allied health fields, and the areas of dissatisfaction within the field of genetic counseling leads us to believe that these experiences pertain to advanced training in genetic counseling.

Future Directions

Several areas of additional research are suggested by this study. Another study with a quantitative focus is needed to determine if there are significant differences in salary and independent billing between genetic counselors with doctoral degrees and genetic counselors with the traditional master's degree. A study of employers is needed to appreciate their views about genetic counselors with doctoral training versus those

with master's training. Such a study could determine what qualities of doctoral training are viewed as advantages by employers and determine what opportunities employers would be more likely to provide to a doctorally-trained candidate. Further, a study of master's trained counselors interested in doctoral training regarding what topics of further education they want will be of importance to counselors involved in program and curriculum development.

Conclusion

This study illustrates the practices and attitudes of genetic counselors who hold doctoral degrees. We demonstrate that there are many paths that genetic counselors take in obtaining doctoral training and that their practice characteristics vary widely. Despite these differences, we show that the attitudes of this group regarding benefits and drawbacks of the doctoral degree are fairly consistent. The perceptions of PhD-holding genetic counselors confirm the predicted advantages and disadvantages. As the profession of genetic counseling continues to grow and expand, it is likely that we will move toward more advanced training options for genetic counselors. The perceived benefits and potential pitfalls outlined here allow us to be simultaneously optimistic and cautious about this exciting new step.

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Appendix A

Email Contact

Dear NSGC member,

I am a graduate student at the University of Cincinnati. As my master's thesis project, I am conducting a qualitative study designed to characterize the practice of full and emeritus members of the NSGC who hold doctoral degrees. You were identified through the 2002-2003 NSGC membership directory as one of the 64 members who hold a doctoral degree. I will be contacting you by phone to invite you to participate in a telephone interview. The interview will take approximately 10-15 minutes depending, on the length of your responses. If you would prefer that I contact you at a specific time, please let me know by email. If you would not like to be contacted, simply email me and I will remove your name from my list. If you have any questions or concerns about the study, please either email me at this address (strangcl@ucmail.uc.edu) or call me at 513-636-5840. Thank you for your time.

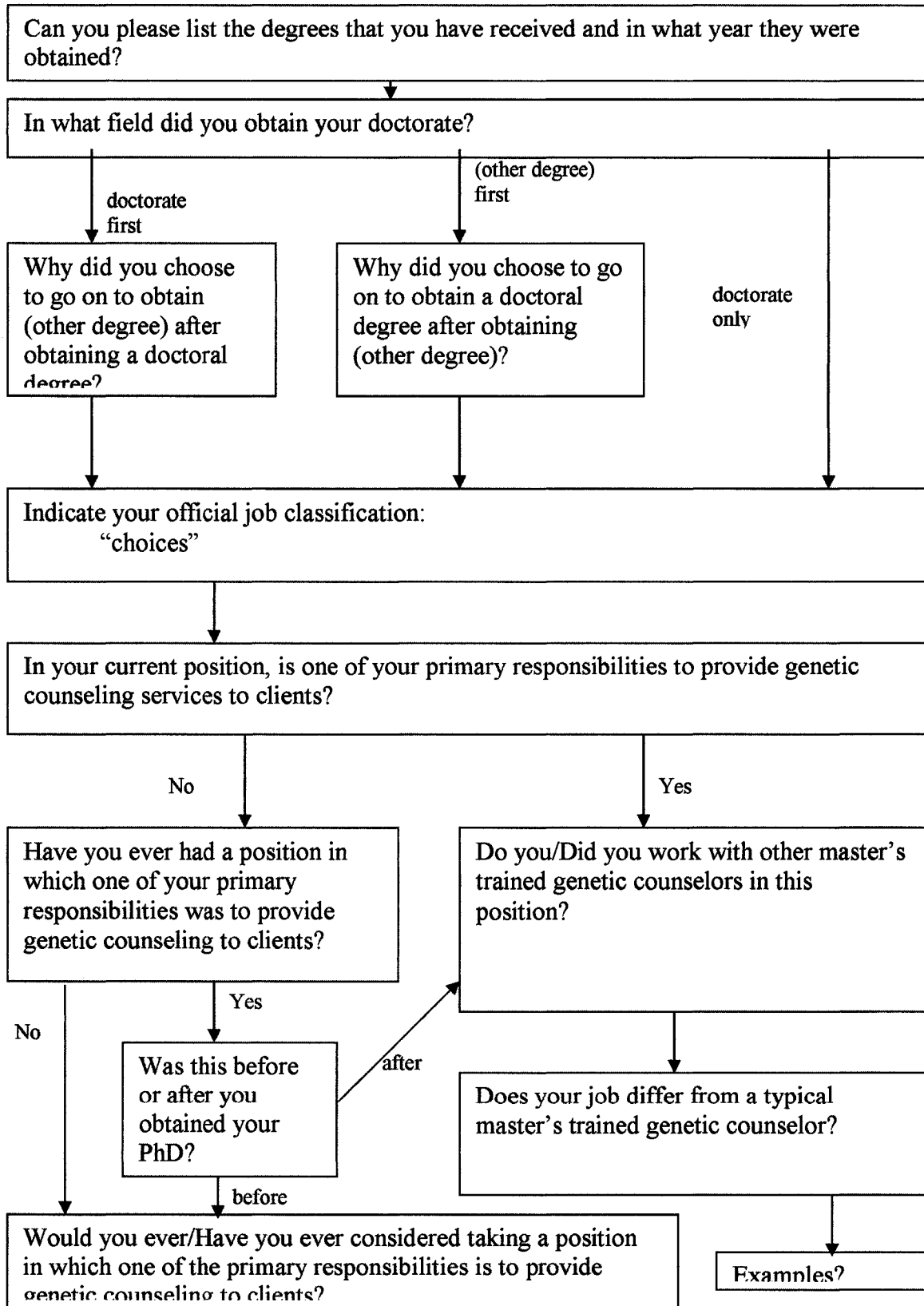
Sincerely,

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Appendix B Questionnaire



Questionnaire (continued)

What do you do on a typical day?

What percentage of your time do you spend doing each of the following?

Clinical work

Research

Teaching

Administrative activities

Other _____

Do you feel having a PhD has had a positive, negative or neutral impact on your career as a genetic counselor?

Why do you feel this way?

What do you see as being the main advantages of having a PhD? examples?

What do you see as being the main disadvantages of having a PhD? examples?

Do you feel having a PhD has affected your level of satisfaction in your current position?

Has the doctoral degree affected your opportunities for advancement? Examples?

Does having a doctoral degree impact how you are perceived by other genetic counselors? Examples?

Does having a doctoral degree impact how you are perceived by other health care professionals you work with? Examples?

Do you feel that the development of a PhD degree in genetic counseling would have a positive, negative or neutral impact on the field of genetic counseling?

In what ways?

Did you complete the Professional Status Survey this year?

What is your gender?

What is your age?

How long have you been employed in your current position?

Appendix C Consent Statement

The following statement will be read to all participants:

“This interview is completely voluntary. By completing the following survey, you indicate your consent to participate in this study. If the results of this study are published in a journal or presented at a scientific meeting, no names or identifying material will be provided. Confidentiality will be maintained and no information about you will be released to outside parties, unless we have your direct authorization. This means that we will not reveal your answers to anyone without your permission. If you feel uncomfortable answering a particular question, please indicate that you do not wish to answer that question. This means that you can change your mind about being in the study at any point in time, and you do not have to answer any questions you do not want to answer. The interview will be audiotaped so that responses can be analyzed later. At the conclusion of the study, these tapes will be destroyed. If you feel uncomfortable, the tape can be stopped at anytime or a response can be erased from the tape at your request. There will be no consequences from choosing not to participate in this study. Are you interested in participating in this study?

Participant Name _____

Verbal Consent Given YES NO

Signature of Interviewer _____

Appendix D

Table 1. Work activities of genetic counselors with doctoral degrees and the general population of genetic counselors

	Genetic Counselors with PhDs		2000 Professional Status Survey Data		χ^2
	N	%	N	%	
Clinical	22	71%	816	85%	<.05
Teaching	24	77%	585	61%	NS*
Administration	19	61%	550	58%	NS*
Research	27	87%	296	31%	<.01
Other	4	13%	176	18%	NS*

*NS=not significant

Table 2. Why did you go on to get a master's degree after getting your doctoral degree? (n=10)

Theme	Number Identifying Theme	Quotes
Changing careers	10	<p>19: "I was interested in changing careers. I wanted to stop doing biomedical research and start working in a different field, especially directly with patients."</p> <p>30: "I felt a bit isolated at the lab bench and really wanted to get more contact with people"</p> <p>31: "I was going to switch careers to genetic counseling and I needed to get a genetic counseling degree"</p>
Always intended to go on	1	<p>30: "had I known about [genetic counseling] I probably would have just gone straight into it and skipped getting a doctorate because it was really what I wanted to do"</p>

Table 3. Why did you decide to go on to get a doctoral degree after getting your master's degree? (n=18)

Theme	Number Identifying Theme	Quotes
Desire to do research	7	6: "I wanted to learn how to do research"
Additional Opportunities	7	10: "Because I wanted to have flexibility in the job market" 28: "I just felt like at the time there were very limited options for career advancement in genetic counseling"
Always intended to go on	3	1: "always knew I would do a PhD....MS was never the terminal degree for me"

Table 4. Do you feel that your practice differs from that of a typical genetic counselor? (n=21)

Theme	Number Identifying Theme	Quotes
No Differences	8	27: "No, I think it was fairly standard"
Perform Research	7	13: "I am the principle investigator in my own research, in my own protocols"
More Autonomy	4	5: "I have considerably more autonomy...I pretty much sort out my own time and my own projects...I work on my own projects" 10: "I am doing professional billing which I think is more rare for master's genetic counselors"
Less Patient Contact	2	28: "I have less patient interaction"
Perform Administrative Roles	2	3: I also...perform...administrative roles"

Table 5. What do you feel are the advantages of having a doctoral degree? (n=31)

Theme	Number Identifying Theme	Quotes
Greater Knowledge and Skills	18	4: "a broader genetics community understanding both of clinical practice and of research" 13: "[I] am more knowledgeable on the things that I need to be...not necessarily genetic counseling but research and protocols, writing grants, things like that...I just feel more prepared because of what I learned in the PhD years" 27: "I found a lot the skills that I developed in my PhD studies were very useful in genetic counseling particularly in terms of not just strictly research, but going to the medical literature, knowing the medical literature, knowing how to use it and utilize it"
Perform Research	17	6: "I could write grants and get funded, design my own studies and be the principle investigator...I have more research opportunity" 22: "The analytical qualities that one needs in order to do research. I think that is a valuable tool no matter what one wants to do" 31: "it actually makes a big difference in terms of being able to apply for grants"
Additional Opportunities	15	1: "Opportunities that you are offered... leadership and academic opportunities" 10: "I think that is has enabled me to secure a higher salary" 28: "I think it gave me a lot more flexibility in the kinds of things that I could do on a day-to-day basis...I think it gave me more room for advancement"
Greater Respect and Recognition	11	31: "it makes them feel like I am more knowledgeable and if I just had a master's they might not be so quick to trust my judgment" 19: "in dealing with some medical professionals, I find that they treat me a little bit better. So it's a question of respect sometimes" 20: "It increases credibility in a physician dominated practice, among my patients and my colleagues"
Tenure Eligibility	5	2: "in order for me to have gone up for tenure and to be retained after a certain number of years, I had to have a PhD to be on tenure track"
Greater Autonomy	5	23: "It allows me to bill differently. It gives me perhaps a greater degree of freedom" 14: "More autonomy... I don't have to report to anybody"

Table 6. What do you feel are the disadvantages of having a doctoral degree? (n=31)

Theme	Number Identifying Theme	Quotes
No Disadvantages	15	13: "not in my experience, no"
Increased Time/Work	8	28: "along with more responsibility comes more time commitment" 6: "getting a PhD - it takes a lot of time... and it is hard work"
MD would have been better	4	15: "I think having an MD/PhD is even better"
Decreased Patient Contact	2	3: "lack of time to see patients"
Decreased Opportunity	2	29: "in some ways they are kind of uncomfortable with the fact that I had a PhD especially when I was interviewing right out of school like they weren't sure what my attitude would be" 17: "in the traditional genetic counseling arena I might be overqualified for certain positions or perceived as overqualified and not have the opportunity to apply for that position"

Table 7. Do you feel that having a doctoral degree has affected your level of satisfaction in your current position? (n=31)

Theme		Number Identifying Theme	Quotes
Positive Impact	Job Requirement/ Additional Opportunities	12	16: "the degree has given me access to the kinds of positions I have had and the positions I have had I have really enjoyed" 28: "I think it has just given me the opportunity for taking on more responsibility, more of a leadership role and just having broader horizons to pursue"
	Research Skills	6	25: "I really wanted to do the research... and I couldn't have done it - I didn't have enough background without it"
	Greater Respect and Recognition	5	2: "there is a certain amount of recognition that goes with an individual that has a PhD" 29: "one thing that frustrates genetic counselors that I have worked with somewhat is sometimes feeling a little bit of a lack of respect and I don't really sense that as much"
	Greater Knowledge and Skills	2	7: "just in having this background and just having the knowledge... helps me understand at deeper levels"
No Impact		6	12: "no, I don't think so" 30: "no, I don't see it as an impediment"
Negative Impact		3	18: "there is always that frustration, that people say could you be putting in a bit more - you've got a PhD."

Table 8. Do you feel that having a doctoral degree has affected your opportunities for advancement? (n=30)

Theme	Number Identifying Theme	Quotes
Tenure Eligibility	9	25: "it's helped me move through the tenure ranks"
Unspecified Positive Impact	7	9: "Yes, I guess I feel like it has made things easier for me"
Additional Opportunities	5	2: "it has opened the doors for advancement to at least have the opportunity to move up in responsibility and in position"
Research Skills	2	28: "it has given me the opportunities to write and lead research projects... write grants for and obtain federal and foundation funding to pursue research questions"
No Impact	7	29: "I don't think so at this point"

Table 9. In your opinion, does having a doctoral degree impact how you are perceived by other genetic counselors? (n=31)

Theme	Number Identifying Theme	Quotes
No Impact	12	26: "I don't think by counselors, no"
Negative Impact	4	29: "a small minority of genetic counselors may be put off by someone having a doctorate degree"
Perceived as More Knowledgeable	3	7: "they may expect I will have more experience, more knowledgeable in that area"

Table 10. In your opinion, does having a doctoral degree impact how you are perceived by other health care professionals? (n=29)

Theme	Number Identifying Theme	Quotes
Greater Respect and Recognition	21	25: "I think it helps them to see you as a more valuable part of the team. I think it helps them take you more seriously" 27: "I think it did kind of give me a little bit more of a standing with those individuals"
Additional Opportunities	4	5: "I think just that whole perception that you shouldn't be an assistant or an associate professor or a professor without the doctorate degree is a pretty widely held perception" 17: "for instance, this position they are trying to create for me, I think that it's the only way that would have happened"
Negative Impact	1	31: "I have had speculation in the past that there are certain jobs where I think it probably has hurt me in terms of getting the job...I am perceived as someone who wouldn't fit in"

Table 11. Do you feel that the development of a PhD in genetic counseling would have a positive, negative, or neutral impact on the field of genetic counseling? (n=31)

Theme		Number Identifying Theme	Quotes
Positive Impact (26)	Research PhD	16	5: "there's a reason to go on to get a degree and a lot of that has to do with the statistics and research design, things that just can't fit into a master's degree program anymore... then I think it could be very positive" 7: "I think just allowing people to have more opportunity to do really in depth research in an area that they are really interested in" 9: "I think it would give counselors who have any interest in research more grounding, more formal training in that area"
	Opportunity to gain additional knowledge	8	23: "I feel that genetic counselors do not have the breadth of training in genetics overall that I received when I was a doctoral student. It's the depth of training across disciplines within genetics" 26: "what one has to, for a PhD, do is focus on the one area that you want to become an expert in"
	Move Profession Forward	7	9: "increase the profile of genetic counseling in a wider sphere" 20: "It would help to develop the science of genetic counseling. Any type of profession needs to have its own knowledge base and theory base, and once you get your own PhD, I think it would help that to come about."
	Additional Opportunities	6	9: "I think it would increase the diversity of jobs in the field that were available" 10: "I think it would provide an additional avenue for professional advancement"
	Greater Respect for Genetic Counselors	5	3: "It would have a positive impact for those individuals of getting perhaps more recognition" 7: "and for genetic counselors to get more respect from other medical professionals"

Table 11 (Continued). Do you feel that the development of a PhD in genetic counseling would have a positive, negative, or neutral impact on the field of genetic counseling? (n=31)

Theme	Number Identifying Theme	Quotes
Neutral/ Undecided (14)	Depends on Curriculum	<p>13: "I really don't know how to answer that because it depends on what a PhD in genetic counseling would entitle, what the curriculum would give and what experience they would get"</p> <p>17: "I think it depends on what the focus of the PhD program is. A PhD in itself doesn't mean anything unless there is some specific criteria behind it, so I think it would really depend on what the training program would involve"</p>
	No Benefit	<p>11: "I personally don't see what a PhD in genetic counseling would provide someone"</p> <p>31: "I mean if they see themselves as basically providing clinical service it is not clear. I mean a PhD is basically a research degree so if genetic counselors see themselves as kind of continuing the way they have then I think a PhD probably seem irrelevant"</p>
Negative Impact (5)	Minimize Opportunities for Master's Genetic Counselors	<p>4: "it will minimize the opportunities for those who are master's-trained and create a tiered system that will limit their opportunities"</p> <p>23: "I think the model that comes frequently to mind is Pharmacy - the MS is really no longer there. You come and you get a PharmD, which is a clinical position."</p>