IDENTIFICATION AND PRIORITIZATION OF DERMATOLOGICAL DISORDERS

INFLUENCED BY FEMALE HORMONAL FLUCTUATIONS DURING AND

BEYOND MENOPAUSE

A Thesis Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

by

Sobia Khan, MD

May 2016

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Acknowledgements

I am truly grateful to the members of my adviser committee, friends and family for making this dream come true. My immense gratitude is destined towards:

- My loving and generous mother for always praying for me.

- My kind father for always supporting and believing in me.

- My talented brothers and sisters for helping in my times of need.

- My sweet children Maryam and Mustafa for being my cheerleaders.

- My dear husband for being the anchor, I could always count on.

- My precious members of adviser committee for their endless guidance.

- My doctoral classmates for being true friends and source of inspiration.

- The supportive faculty members of Panel A and Panel B for their participation and timely feedback.

Finally, this entire educational effort is dedicated to my dearest grand mother for the unconditional and endless love she shared with us throughout her life. I have known her as the most fun-loving, vibrant and courageous person in this world. She was a perfect blend of character, integrity and humor and always surprised me by showing up at the times when I most needed a warm hug and sincere guidance. Thank you Nani Ma for being the best grand mother ever!

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Sobia Khan. "Identification and Prioritization of Dermatological Disorders Influenced by Female Hormonal Fluctuations During and Beyond Menopause." Unpublished Doctor of Education Thesis, University of Houston, May 2016.

Abstract

Menopause is a natural and universal milestone achieved by every living female by the time of midlife. Worldwide, the number of postmenopausal women is expected to rise to 1.1 billion by 2025. Therefore, medical education and healthcare trainings are consistently going through updates and curricular transformations to incorporate teachings of age and gender related disorders, their diagnostic protocols and effective therapeutic options. The dermatology residents' current curriculum is predominantly taught on the basis of skin type and color and rarely on the gender-, hormonal- or age-related context. Knowledge about how to evaluate and manage disorders pertaining to skin, hair and nails in the midst of aging and hormonal fluctuations of menopause is not being strategically taught or included in the current resident dermatology curriculum. In order to diversify the curricula, this research effort was focused on identifying and prioritizing the most significant dermatological disorders influenced by female hormonal fluctuations during and beyond natural and induced menopause, using the Delphi Method. A convenience sample of thirty physicians from five different departments (dermatology, gynecology, rheumatology, internal medicine, and family medicine) of a large medical institute, in southwest of United States was recruited to participate in the study. In round 1, there was 100% participation of five experts, invited to form Panel A of the Delphi study. The experts in Panel A, gave profound feedback to refine and reorganize the list of skin disorders created by the researcher through the intense evidence- based medical literature review. There was an 89% of participation rate among

the twenty-eight faculty members invited to become Panel B experts in round 2 of this study. During round 3, 100% of the experts who previously participated as Panel B provided feedback. The calculated median for the ranking of each skin disorder by Panel B was three or above in round 2 and 3, with significant convergence and minimum variability. The most highly ranked category of skin disorders affected by hormone changes at menopause was identified to be gynecological disorders. Among the subcategories, the overall most highly ranked skin disorder was identified to be hirsutism followed by vulvovaginal atrophy. In conclusion, the need for curriculum enrichment has been identified during and at the completion of this Delphi study by the ranking and feedback given by the majority of the Panel A and Panel B experts of the study. This entails bringing in more knowledge and resources into a preexisting curriculum to teach the medical students and residents about the influence of hormone changes at menopause on skin disorders prioritized via this research study. The results of this Delphi study can be utilized to extend the core curriculum by restoring the excitement of teaching the same known skin disorders, in the context of hormonal changes at menopause. It can reinforce the same concepts and knowledge with broader application and understanding of effects of age, gender and hormones on common skin disorders. This understanding can further potentially assist in correctly risk-stratifying patients to be treated or not treated by hormone replacement therapy at menopause.

Keywords: Menopause, Dermatologic Disorders and Delphi Method

Table of Contents

List of Tables

List of Figures

Chapter I

Introduction

Historically the lifespan of humans stayed constant until only a century ago. As research in health science has evolved, the life expectancy of humans has doubled. According to the recently published CDC statistics, the age-adjusted death rate in United States declined from 1,010.6 deaths per 100,000 population in 1979 to 724.6 per 100,000 population in year 2014. It has been recognized as the lowest death rate ever recorded. Furthermore, during the same period rates of female deaths declined 21.9% from 789.9 to 616.7 and rates for males declined 35.0% from 1,316.2 to 855.1, which led to significantly narrow mortality gap between males and females (CDC Quickstats, 2016).

Not until recently have research studies portrayed the image of menopause as an evolutionary anomaly, leading to survival of women past the cessation of the menstrual cycle (Kwolek, Nora & Nash, 1999). Menopause is a natural and universal milestone that every living female achieves by midlife. It is best described as a normal physiological phenomenon rather than a commonly portrayed pathological concern for women's health. Menopause is scientifically defined to occur after a natural absence of periods for twelve months.

In today's era when the life expectancy of many females is projected to exceed age 80, understanding menopausal medicine has become an urgent concern (Health Resources and Services Administration, 1997). The scientific paradigms theorizing menopause from physiological, endocrine and psychological perspective are numerous and exist with considerable variations (Kwolek et al, 1999). Some emphasize on physical changes and the effects of aging while others describe menopause in the context of

mental and psychological changes. Despite the differences, these definitions have the combined consensus that menopause is a hallmark of midlife for every female and calls for similar attention as is historically paid to other women's health arenas, e.g. menarche, contraception, sexual health and reproductive medicine (Nieman, Ruttenberg, Levison, Kuzma, & Rudnitsky, 1997).

Statement of the Problem

Due to the global variance of menopausal symptomology among women, an individualized rather than generalized approach in evaluation, diagnostics and therapeutics is advocated for symptom control during this time (Nelson, Nicolette & Johnson, 1997; Papa & Harasym, 1999). The average life expectancy in the United States for women has increased from 77.4 to 81.2 years and 70.0 to 76.4 years for men between 1980 and 2013 (National Center of Health Statistics, 2015). The longevity of life among females in the 21st century appears to be a monumental feat indicating that advancements in health science research have significantly overcome the causation and sequelae of fertility and reproductive age-related diseases that historically has led to early onset of morbidity and mortality among females. However, it also calls for better understanding of age-related changes and diseases to ensure quality as well as longevity of life. This has further enhanced the significance of research studies towards evidence-based understanding of menopausal medicine, especially in women's health education and curricular development (Autry, Meurer, Barnabei, Green, Johnson-Masotti, Otto-Salaj & Simpson, 2002). Historically, menopausal medicine has not been emphasized as an educational entity that needs similar attention in medical education as reproductive medicine or fertility issues (Nieman et al, 1997). The scientific literature in medical

education indicates that surveys completed by medical students, residents, fellows and physicians reflect a paucity in their understanding of menopausal hormonal fluctuations and its influence on physiology and pathology of organ systems and female psychology (Philips, Anderson & Ridl, 2003; Parsey, Bastion, Couchman, Slack & Simel, 1998).

The skin is identified to be the largest organ of the body that manifests and reflects such age-related changes earlier than any other organ system of the body during and beyond menopause (Osman, Mufaddel, Almugaddam & Augusterfer, 2011). The diagnostic and therapeutic understanding of various skin disorders in the midst of female aging and hormonal fluctuations and the effects of such changes on the prognosis of skin disorders, is neither clearly taught nor classified and consolidated in the current resident dermatology curriculum (Verdier-Sevrian, 2006). The need to establish a focused curriculum for dermatology residents based on the influence of hormonal fluctuations on skin disorders during and beyond menopause was identified through a comprehensive review of current dermatology and menopause curricula and evidence-based medical literature, (Dr. R.J. Wolf, personal communication, April 5, 2015). In this research effort, a Delphi study was designed and completed to recruit and involve the faculty and experts in women's health at a large institute in southwest of United States, to develop a consensus on the skin disorders that should be included in developing an educational repository. The curricular topics identified and prioritized through this research effort are expected to facilitate the development of focused curricula to be strategically taught to dermatology residents, and potentially trainees and residents from other medical disciplines. The skill set and educational objectives related to the diagnosis, prognosis and treatment of such identified conditions in relevance to female hormonal changes and

subsequently their conceptual articulation can potentially lead towards implementing a unique curriculum in the future. Furthermore, it can empower the faculty to effectively decipher the relevant pathophysiology of the most common menopausal dermatologic disorders to promote influential teaching and learning during residency training.

Purpose of the Study

The purpose of this study was to generate expert consensus regarding the most significant skin disorders in the context of fluctuating hormonal levels during and beyond natural or induced menopause, that should be included in the curriculum for dermatology residents. The review of the current dermatology and menopausal medicine curriculum indicated that there was a lack of significant educational content on gender specific skin conditions as well as certain pre-existing skin disorders that are influenced by menopausal hormonal fluctuations (Lee & Zane, 2007).

Research Question

The study was designed to answer the following question:

What are the most significant dermatological disorders, influenced by female hormonal fluctuations during and beyond natural or induced menopause that should be included in the dermatology curriculum for residents?

Context of the Study

The current steps taken in medical legislation and efforts made in educational research towards improving and establishing women's health curricula in medical education are impressive (HRSA, 1996). The American Medical Women's Association (AMWA) has made great strides in the development and dissemination of women's health curriculum resources. In 1993-1994, the AMWA convened the Advanced

Women's Health Curriculum conference, created the Reproductive Health curriculum and, in 1996, published the textbook, The Women's Complete Health-book and Training Manual for Gender Mainstreaming in Health (Rio & Simpson, 1998). In 2008, the AMWA planned to strategically work on creation of educational modules on sex and gender-based topics, course materials and guidance for inclusion of these materials in medical school curricula (Werbinski, 2008). It is however, imperative to also introduce and emphasize menopausal medicine in medical education as a separate entity, with as much significance in attainment of knowledge as reproductive medicine in the women's health curricula for medical students and residents (Philips, 2002). Unless this missing piece of the puzzle is assigned its place in medical education, answers to women's health questions and disease processes will not be fully understood and incorporated in the clinical practice and decision-making of physicians for comprehensive patient care.

After completing medical school, most graduating students continue their educational training in medicine or surgery to become specialized in their chosen field (Donoghue, 2000; Levison, Weiss, Puglia, Nieman, & Donoghue, 1998). Therefore, a comprehensive residency curriculum comprised of didactic sessions, forms the foundation of the understanding of most common clinical scenarios that physicians encounter and manage in their clinical practice (Kwolek et al, 1999). Subspecialties such as cardiology, endocrinology, rheumatology and geriatrics are becoming more and more aware of gender- and age-related risk stratification of organ system diseases. They promote and emphasize clinical education in areas of gender- and age-specific variations and encourage this understanding for medicinal, diagnostic and therapeutic reasoning. This concludes with residents acquiring confidence in utilizing analytical knowledge and

research capabilities towards age- and gender-specific disorders in their subsequent specialty. Hence, it cannot be emphasized enough that medical residency training is the critical time to introduce the understanding and the significance of "gender-specific" care to future physicians.

Menopause by and large is one of the most significant, yet under-taught, areas in medical school and medical residency education. As a consequence, the lack of knowledge and training in menopausal medicine has led to increasing anxiety and discomfort for residents and physicians in identifying and managing aging skin, skin cancer screening, vasomotor symptoms, vulvovaginal skin changes, bone and sexual health issues during a clinical encounter (Jiang, Sab, Diamen & Schnatz, 2012). Ultimately, this leads to patient dissatisfaction and unjustified referrals to gynecologists, endocrinologists, dermatologists, urologists, and oncologists for preventative care and risks stratification of organ system disorders influenced by simple aging and female hormonal changes.

Significance of the Study

The North American Menopause Society (NAMS) and the American College of Obstetricians and Gynecologists (ACOG) are the two major governing bodies promoting the research and education of menopause-related health issues. A current review of their published literature indicates that a significant number of repositories of evidence-based medical literature and consolidated learning materials on midlife preventive care and menopausal hormonal fluctuations affecting sexual, mental, cardiovascular, neurological, vulvovaginal, bone, and breast health has been developed. However, very scant and fragmented educational content is available on menopausal hormonal fluctuations on

aging skin and pre-existing skin diseases. This highlights the importance of conducting this Delphi study to first identify and classify such prevalent skin disorders, and then consolidate skill sets and learning competencies around these skin disorders to develop a curriculum.

Educational Value of the Study

Many dermatologic conditions and disorders identified in a review of medical literature (e.g., Systemic Lupus Erythematosis, Psoriasis, Photoaging, Hirsutism, Rosacea, Acne, Androgenic Alopecia) could stabilize, improve or get worse at the time of perimenopause or after natural and induced menopause. A review of the medical education literature suggests that very little, if any, efforts are made to classify, teach and manage such dermatologic diseases in the context of a patient's fluctuating hormonal milieu (Jiang et al, 2012). Yet in clinical practice, internists, endocrinologists, gynecologists, rheumatologists and dermatologists are consistently challenged by patients presenting with such skin diseases that could be managed effectively if gender and age-related hormonal changes were factored into the clinical decision-making for treatment of those disorders. This study has assisted in determining the educational consensus of the medical and surgical women's health specialists on such dermatologic skin disorders, affected most by menopausal hormonal fluctuations.

Definition of Terms

Table 1

Definition of Terms

Term	Definition
Dermatology	The branch of medicine that deals with the structure, function and diseases of skin, hair and nails (Merriam-Webster's online dictionary, n.d)
Female Hormones	A product of living cells that circulates in body fluids (as blood) or sap and produces a specific often stimulatory effect on the activity of cells usually remote from its point of origin. Examples of female hormones are estrogen, progesterone and testosterone (Mayo Clinic online, n.d)
Induced Menopause	Menopause induced by an unnatural event such as occurs when the ovaries are damaged by radiation, chemotherapy, other medications or their surgical removal (Mayo Clinic online, n.d)
Natural Menopause	Menopause occurs twelve months after the last menstrual period and marks the end of menstrual cycles. It can happen between ages 45 and 55 but the average age is 51years in United States (Mayo Clinic online, n.d)
Pathophysiology	The disorder or disease caused by absence of regular function of a human organ (Mayo Clinic online, n.d)
Perimenopause	The time period during which a woman's body makes its natural transition toward permanent infertility (menopause). It is also called menopausal transition (Mayo Clinic online, n.d)
Presenting	To have a certain symptom or medical condition, especially as reported during a medical examination (Merriam Webster Dictionary).
Resident	A graduate and licensed physician receiving training in a medical or surgical specialty in an academic hospital (Mayo Clinic online, n.d)

Limitations of the Study

The following limitations of the study have been identified:

1. The expert panel consisted of physicians belonging to a single large medical institute in the southwestern United States.

2. The study was limited to only identifying the hair, nails and skin-related disorders most influenced by menopausal hormonal fluctuations. It did not include the influence of menopause on any other female organ system.

Summary

Although menopause is a natural and universal milestone achieved by every living female, most dermatologists and internists do not factor in hormonal changes while treating skin diseases and conditions. This reflects the lack of knowledge about its fundamentals, which at times leads to incorrect diagnosis, redundancy in treatment and poor prognosis of skin diseases among menopausal women. There is a significant dearth of medical literature on this particular topic in the field of dermatology. The intent of this Delphi study was to determine the consensus of expert faculty members on dermatologic skin disorders most affected by menopause. The results of this research effort are a significant step towards designing a curriculum around these conditions in the future.

Chapter II

Review of Literature

The aging population is increasing, and women are at the forefront of this growth.

The anticipated silver tsunami of baby boomers is setting new priorities in healthcare and

its dissemination (Christianson, Ducie, Altman, Khafagy & Shen, 2013). Therefore,

current educational and clinical research is consistently highlighting and promoting

gender and age specific variations (HRSA, 1996). Female hormones fluctuate throughout

the life of a female (e.g. puberty, menarche, reproductive age, pregnancy and menopause)

affecting virtually every organ system of her body (Jiang, et al., 2012; Lee & Zane,

2007). The skin is the largest organ system of the body and covers 16-22 square feet of

surface area. The health of the skin correlates with underlying medical conditions,

nutritional status, lifestyle as well as age-related hormonal fluctuations. Hormone-related

skin changes are especially evident at the time of menopause. However, there is a paucity

of medical literature and educational curricula explaining the effect of menopausal

hormonal changes on normal and abnormal skin conditions (Philips, Anderson, & Ridl,

2003).

Literature Review

The online databases of Dissertation Abstracts International, ERIC, MEDLINE

and PubMed were searched to obtain current information concerning the following

topics:

1. Women's health and medical curricula (evaluating, developing and

   incorporating women's health curricula).

2. Menopausal medicine curricula and the effect of menopausal hormonal

changes on reported organ system of female body.

3. Dermatology medical literature for streamlining the curricula and competencies around diseases influenced by menopausal hormone changes (pathophysiology, diagnosis and treatment).

4. The Delphi Method and its application in the medical curriculum.

Academic literature in dermatology and women's health provides some fragmented knowledge related to menopausal hormonal changes on skin disorders. However, the literature review research did not identify any curriculum or repository pertaining to the subject being investigated in this research study (Kasperska-Zajac, Brzoza, & Rogala, 2008; Kim et al., 2006).

Historical Perspective of Menopause

Historically, women died at younger ages due to childbirth complications, lack of preventive care, manifestations of cancer and epidemics of infectious diseases. The life expectancy of women born during the Roman Empire was about 29 years; in the late medieval period, the life expectancy of women rose to 33 years. However, currently in the United States, the number of women older than 51 is expected to reach more than 50 million by 2020 (US Census Bureau, 2010), and worldwide the number of postmenopausal women is expected to rise to 1.1 billion by 2025 (United Nations, Department of Economic and Social Affairs, Population Division, 2007). In the present decade, one in every ten people in the population is over age 65, and it is estimated that one in six will be over 65 in 2030 (United Nations, Department of Economic and Social Affairs, Population Division, 2007). New reports on age and gender-related trends among the human population in future decades and its global implications on future healthcare,

residential needs, and the medical needs of an aging population, is leading towards

strategic national planning. Since in the past women commonly would not live beyond

age fifty, menopause has been a rather new phenomenon for healthcare providers and

physicians to deal with over the past few decades. Since the average age of menopause is

fifty-one years and women in United States have life expectancy exceeding eighty years

of age, they are expected to live practically one third of their lives beyond menopause.

Significance of Menopause

From a public health policy perspective, menopause has been suggested as a

milestone to bring women back into the healthcare system. This is the stage of life when

women should receive comprehensive and individualized attention regarding preventative

screening and early identification of diseases and risk stratification of present conditions.

If this window is missed, most women develop comorbid disease conditions later in their

lives that could have been avoided with preventive care and screening. In recent decades,

menopause has been a topic of discussion in different fields of health care such as

nursing, the pharmaceutical industry, psychology and sociology. However, significant

gaps in knowledge exist regarding the understanding of this important transition in

female physiology, and the implications of hormone fluctuations on all organ systems of

the body. Furthermore, chronic disease conditions and their prognosis are not studied in

the context of menopausal hormonal fluctuations, which have been shown to vary

globally (Jiang et al., 2012). Most common among menopausal hormone fluctuations are

hot flashes, night sweats, insomnia, mood instability, lack of sexual desire, vaginal

dryness and pain, skin and hair changes, and osteoporosis (loss of bone density). These

symptoms can be extremely debilitating in some females and can significantly affect their

quality of life, leading them to seek help from unlicensed practitioners and alternative medications (Santen, Stuenkel, Burger, & Manson, 2014; Gass et al., 2015).

Most alternative medicine treatments lack the validity of being tested by randomized clinical trials and FDA approval, and many are not safe for patients. Menopausal Hormone Treatment (MHT) was considered the only therapeutic option for the previously described symptoms at the time when the Women Health Initiative study was established in 1991. However, after results were published indicating a positive correlation between MHT and cancer, media reports prompted many females to stop MHT, consequently more and more menopausal symptoms began to surface among females undergoing natural, surgical or chemical induced menopause (Watkins, 2007). This led to an enormous amount of basic science research aimed at the understanding of pathophysiology and genetics of the menopause symptoms (Krieger, Löwy, Aronowitz, Bigby, Dickersin, Garner & Gaudillière, 2005). This has been followed by a significant increase in the development of targeted pharmaceutical products, randomized controlled trials, and FDA approval of effective medications for deleterious symptoms of menopause in affected females (Watkins, 2007). Menopause is the time in a female's life that is the perfect opportunity to screen for risk factors, to educate them about the symptoms that can lead to apprehension and disruptive lifestyle and finally treat for existing diseases and disorders to improve their future quality and quantity of life (Jiang et al, 2012; Gass et al., 2015).

The goal of this research was to identify the most significant dermatological disorders that should be taught during dermatology residency training in the context of female hormonal fluctuations, as a result of natural or induced menopause. The need to

identify and prioritize these topics is rooted from the concerns presented by females in menopause, the significance of menopause in medicine, and the significance of menopause specifically in dermatological medicine (Tur, 1997).

Evolution and Development of Women's Health Curriculum

There are very few medical schools and medical residency programs with a special women's health curriculum incorporating education on gender-specific differences in diseases, available treatments and preventive health. In the early 1990s, the United States Congress identified a deficit in the medical care women received compared to men. Medical schools were then encouraged to implement women's health curricula in 1990 (Keitt, Wagner, Tong & Marts, 2003; Henrich, 2004).

To identify and overcome this deficiency, the Office of Women's Health (OWH) in the U.S. Department of Health and Human Services was established in 1991 to improve the health of American women (Henrich, 2004). In 1994, the Office of Research on Women's Health (ORWH) at the National Institutes of Health (NIH) in collaboration with the Association of American Medical Colleges conducted a study to determine the extent of women's health curricula taught in the 125 U.S. medical schools. The response rate was high (82%), and the data showed that only 14% of those schools had a formal women's health curriculum and only 28% had a women's health clinical rotation. In 1999, the Liaison Committee on Medical Education, the accrediting body for all American medical schools, administered the survey again (Kwolek et al., 1999). The response rate was 100%, but unfortunately the percentage of American medical colleges that had a women's health clinical rotation was unchanged (28%). The survey was repeated again in 2001 by the Society for Women's Health; 44% of American medical colleges reported

that they offered a women's health curriculum (Henrich, 2004). Therefore, it is clearly evident that medical schools and residency programs still need to expand their awareness about individualized women's health care beyond reproductive health issues.

Another study was conducted at the University of Texas Medical Branch (UTMB) in Galveston, Texas in 2003 which used a modified Delphi Method to determine the most important topics to include in a women's health curriculum that was being established at UTMB (Philips, Anderson, & Ridl, 2003). The results showed that among the priority list of sixteen Women's Health Initiative topics generated through this method, menopause and hormone replacement therapy were ranked the highest. In another study, internal medicine residents identified that their clinical practice attitudes towards management of menopausal hormone therapy lacked the appropriate risk stratification for patient's symptom management despite the knowledge provided to them during residency training (Hess, Chang, Conigilaro & McNeil, 2015).

Significance of Menopausal Medicine within Women's Health Curriculum

The women's health curriculum is quite broad and includes subjects such as cardiovascular, reproductive, endocrine, bone and sexual health medicine (Parsey, Bastion, Couchman, Slack & Simel, 1998). Most of these topics already exist as a component of a medical school's curriculum. Health science institutions are now beginning to consider implementation of menopausal medicine for a variety of reasons. One reason is the better understanding of age- and hormone- related changes in every organ system of the female body (Nelson, Nicolette & Johnson, 1997). Another important reason is the therapeutic advancement in menopausal medicine for management of vasomotor symptoms, osteoporosis, vaginal atrophy, dyspareunia and sexual health.

Some dedicated teams of women's health specialists have now started implementing an individualized menopausal medicine curriculum in their medical schools and have accomplished great improvement in their student's clinical and academic performance (Jiang et al, 2012).

However, no such targeted curriculum or training exists for dermatology residents to understand the effects of hormones on the skin, hair and nails. As women's life expectancy increases, it is imperative to have skilled physicians take care of them in an individualized and comprehensive manner. In 1997, the Federal Council for Internal Medicine (FCIM) Task Force on the Internal Medicine Residency Curriculum published a document entitled *Graduate Education in Internal Medicine: A Resource Guide to Curriculum Development.* (Sox, Ende, & Ramsey, 1997). This report delineated the important topics and skills that significantly helped structure resident education in women's health. The American College of Physicians, the Society of General Internal Medicine, the American Board of Internal Medicine and the Association of Program Directors in Internal Medicine were responsible for editing and electronically disseminating the resource guide for curriculum development to the accredited internal medicine residency programs in United States, Puerto Rico and Canada. However, there is no data available to support its adherence by the programs. The topics in that holistic curriculum for women's health range from the spectrum of sexual health to domestic violence (HRSA, 1996; Kwolek et al, 1999).

Conclusion

To conclude, it is evident that as the population ages and statistics shift towards middle age individuals, age- and gender-related disease risk stratification and

management becomes more imperative. The specific understanding of menopausal hormonal fluctuations on each organ system of the female body forms the foundation of pathophysiology of certain diseases and their treatment. Menopausal medicine is comprised of the comprehension of menopausal hormonal fluctuations and the development and utilization of therapeutic modalities towards treating the disruptive menopausal symptoms. It is a core curricular component of women's health education that needs to be incorporated strategically for every medical specialty, in order to maximize learning in this field.

Medical literature is becoming dense with evidence-based knowledge about the effects of hormone changes on cardiovascular system, gynecology, endocrinology, sexual and bone health in the context of hormonal changes at menopause. However, the field of dermatology lacks such classified curriculum. Current knowledge about the physiological influence of female sex hormones on the skin emphasizes their potential role in the pathophysiology of certain skin disorders prevalent in menopausal female. Therefore, the objective of this research study was to obtain consensus from experts about the categories and subcategories of dermatological disorders and diseases most influenced by menopausal hormonal fluctuation. In the future, this knowledge could form a basis of a creative curriculum around these topics to encourage structured learning during residency training.

Chapter III

Methodology

Statement of the Problem

Evidence-based research conducted in the field of women's healthcare over the past two decades has significantly enhanced our knowledge of sex and gender variations influencing diagnosis, treatment, and outcomes of pathological conditions affecting men and women (Donoghue, 1996). The next step is to emphasize that the same holds true for age-related risk stratification and disease management in gender-specific medicine. Hormonal fluctuations and deficiencies in different age groups of females potentially influence every organ system of the female body. However, these fluctuations and deficiencies are not strategically taught in the medical school or residency curriculum to develop the competencies of future clinical practitioners in addressing hormonal concerns regarding various disease processes in the context of menopause (Dao & Kazin, 2007). Various organizations and societies are working effectively to address the gaps in medical knowledge in regards to gender differences and to broaden the scope of individualized healthcare considerations (Osman, Mufaddel, Almugaddam & Augusterfer, 2011). This has led to an increased need to assess, identify and prepare the essential content for appropriate training of medical students, residents and faculty (Ricanati & Thacker, 2007).

Skin is the largest organ system of the body and is similar to a highly expressive canvas that reflects the physiology and pathology of other organ systems, at times prior to the expression of any other symptoms of the disease processes. While the medical literature is becoming dense with understating of disorders of the cardiovascular system,

gynecology, endocrinology, sexual and bone health in the context of hormonal changes at menopause, the field of dermatology lacks such classified curriculum (Giacomoni, Mammone & Teri, 2009). The intent of this research study was to identify and prioritize the significant dermatologic disorders that are influenced by hormonal fluctuations during and beyond natural or induced menopause (Osman, et al., 2011).

The recognition that women's healthcare needs are different from those of men has broadened the scope of healthcare and enabled gender-specific learning to take place in clinical care, research, and education (Carnes, Vandenbosche, Agatisa, Hirshfield, Dan, Shaver & Mclaughin, 2001). However, much remains to be identified concerning the impact of hormonal fluctuations on the disorders pertaining to skin, hair and nails of women during and beyond menopause and the efficacy of the various treatments (Dao & Kazin, 2007). A review of dermatology, women's health and menopause journals, text books, and curricula has been noted to have no consolidated review of management of common skin disorders in the context of hormonal changes at menopause, despite the fact that these skin conditions are the leading reason for women to seek medical attention at menopause (Redmond, 1995).

It has been identified that menopausal medicine is one of the most under-taught subjects in medical school and residency curricula among women's health topics (Philips et al, 2003). This leads to a lack of understanding among practicing physicians, in regards to the impact female hormonal fluctuations have on medical disorders at menopause (Parsey, Bastion, Couchman, Slack & Simel, 1998; Philips et al, 2003). Women in the menopausal age group require strategic evaluation, diagnosis and treatment of normal and abnormal skin conditions. The dermatology curriculum is predominantly taught on the

basis of skin type and color and sporadically, in the context and background of gender, hormonal- or age-related variations. The results of this Delphi study will form the foundation of a curriculum based on the relationship of skin disorders and diseases to such hormonal variations (Redmond, 1995). A medical literature review and Delphi Method forms the basis of the methodology of this research effort, to identify and prioritize the key dermatological disorders affecting women during and beyond menopause.

Research Question

The purpose of this study was to generate expert consensus regarding the most significant skin disorders, influenced by the fluctuating hormonal levels during and beyond natural or induced menopause in females that dermatology residents need to learn during their training. Thus, this study was designed to answer the following question:

What are the most significant dermatological disorders, influenced by female hormonal fluctuations during and beyond natural or induced menopause that should be included in the dermatology curriculum for residents?

The Research Design: Delphi Method

The necessity to predict future outcomes and needs has been considered significant since antiquity. Norman Dalkey and Olaf Helmer are credited with the introduction and development of the Delphi Technique for the RAND Corporation in 1948 (Murry & Hammons, 1995). They utilized this method for forecasting military priorities for the United States Air Force to anticipate future technological development to protect America. They attempted to prioritize and objectify the required advancements by gaining consensus from experts without having in-person interaction among them.

Since Dalkey and Helmer's initial work, the Delphi Method in research has become a multi-criteria decision-making and forecasting tool that has been widely used in managerial, technology, and medical education research as an opinion-capturing approach leading to academic solicitation without direct discussion with the members of the group (Azani & Khorramshahgol, 1990). It leads the researcher towards effective ranking and consensus of opinion and incorporates stability, controlled feedback and unbiased anonymous ranking. It was originally designed to overcome the challenges encountered in panel discussions and group interactions (Bardecki, 1984). The anonymous nature and lack of individual accountability of this technique encourages creativity and unique suggestions (Bardecki, 1984).

Four features characterize a Delphi procedure: anonymity, iteration, controlled feedback, and statistical aggregation of group response (Rowe & Wright, 1999). Anonymity is achieved through the use of questionnaires. The experts remain anonymous to avoid debates and influence of authoritative participants. The anonymity of the poll is one of the main contributions to the popularity and effectiveness of the Delphi Method (Oelkers, 1996). This allows group members the freedom to express their own beliefs, providing them with the opportunity to consider each idea on the basis of merit alone.

Iteration occurs by means of presenting the constructed questionnaire over a number of rounds, allowing members to change their opinions. Controlled feedback takes place between rounds, during which each group member is informed of the opinions or median rankings of the other group members (Rowe & Wright, 1999). This feedback is presented in the form of simple statistical summary. Statistical group response is obtained at the end of the procedure where group judgment is expressed as a mean, and the extent

of the spread of members opinions may be used as an indication of the strength of the

consensus (Rowe, Wright, & Bolger, 1991). Consensus reached by the group reflects

reasoned opinions because the Delphi process reinforces group members to logically

consider the problem being addressed. However, lack of participant motivation to fully

participate in the study until it's complete, may lead to sample attrition (Murry &

Hammons, 1995).

The Delphi method has the potential to be the most practical technique to bring

specialists in different areas together, whose opinions are crucial in defining the learning

topics and competencies (Gordon & Pease, 2006; Bardecki, 1984). The Delphi method

represents an effective and reliable communication tool to facilitate the formation of a

group judgment among experts (Gupta & Clarke, 1996). This method is a useful

technique that provides significant information and a structured process for collecting and

distilling knowledge from a group of experts by using series of questionnaires

interspersed with controlled opinion feedback (Adler & Ziglio, 1996; Rauch, 1979). This

further leads to facilitating the finalization and formation of a consensus statement

(Helmer-Hirschburg, 1967).

One of the benefits of the Delphi method is to limit the social interactive behavior

that leads to misconceptions and distractions from decisive opinion during the group

discussions. This method makes discussions among the experts more effective and

significantly productive even in the absence of lack of scientific knowledge (Nelms &

Porter, 1985). This leads the decision makers to rely on their own intuition and

background knowledge rather than being influenced by other experts in the field (Philips,

Longoria, Strum, Delaney & Taylor, 1991).

Delphi Survey vs. Tradition Survey Method

By comparing a research effort using a traditional survey to a Delphi study, the Delphi method is superior for utilizing a team of expert panelists rather than a random sample, and has better constructive validity and reliability due to iteration and sharing feedback by repeating the surveys (Landeta, 2006; Okoli & Pawlowski, 2004).

Application of the Delphi Method in Medical Education

The Delphi method is highly utilized in medical education to acquire an unbiased consensus, primarily to identify educational goals and objectives, to assist in strategic planning and implementation of medical curriculum, to gather expert consensus on diagnostic criteria for rare diseases and to develop competency evaluation scales for medical students and residents (Philips et al, 1991; Ross, Metcalf, Bulger & Housner, 2014). It is considered highly effective in overcoming constraints and social distractions experienced during face-to-face discussions (Philips et al, 2003). Specific to the field of medicine, consensus in decision-making by an expert panel is likely to be more valid than decisions made by a single person (Murry & Hammons, 1995).

Research Participant Population

This research study was conducted at a large medical institute in the southwestern United States after IRB approval was obtained.

Panel A

Panel A consisted of five senior faculty members identified as the senior most specialists in their subsequent subspecialty (i.e. chief, head or director) of dermatology, gynecology, rheumatology, internal medicine or family medicine. The researcher

identified these senior faculty members by their institutional titles. These faculty members could also nominate or suggest eligible participants for Panel B.

Panel B

Panel B was comprised of 28 faculty members consisting of 8 (27%) dermatologists, 7 (23%) gynecologists, 3 (10%) rheumatologists, 7 (23%) internists and 5 (17%) family physicians to assist with prioritization of clinically relevant dermatological disorders and diseases effecting menopausal women.

Panelist Expertise and Selection Criteria

Panel A members were requested to assist with the creation, verification and correction of the initial survey questionnaire. In case of low response in the recruitment of a Panel B member from a particular department, Panel A members also assisted with identification of eligible faculty members. The credentials of faculty members participating in Panel A and Panel B were reviewed through the institutional intranet website and a list of their emails was created. The expertise in women's health of Panel B members was evidenced by their educational activities, research studies, journal articles, presentations and books that made their feedback valuable.

A request was made to Panel B members to possibly submit *curricula vita* to the researcher for review in order to qualify for following inclusion criteria, in case updated credentials were not available on the institutional website. They were expected to successfully meet three of the following four inclusion criteria to be eligible to participate in the study.

1. A faculty member in good standing for at least two years (could be longer for those who have obtained the rank of section chief or director) in the field of dermatology, rheumatology, gynecology, internal or family medicine.

2. Clinical practice consisting of at least 30% female patients who are in midlife or beyond.

3. Board certified or board eligible in his/her medical specialty.

4. Interested in women's health as evidenced by their publications, educational interest and patient panel.

Having experts from different specialties and subspecialties within the same institutional facility provided an opportunity for a wider range of ideas and a broader acceptability of the content areas at the completion of the study.

The Delphi Method Stepwise Application

This research effort utilized the Delphi Method, which was modified to incorporate the knowledge gained through the literature review in the formation of an initial survey questionnaire. The original list of topics was generated from a review of the medical literature and vetted by Panel A in the first round. Panel B was then recruited to prioritize the topics for the next two rounds as explained below. The following are the steps of the methodology of this study:

Step1. Creation of list of topics:

The researcher conducted a medical literature review of journals, online articles, books and published residency curricula to create a list of disorders pertinent to research questions in the form of an Excel spreadsheet. These dermatologic disorders were subcategorized according to diseases effecting different organ systems of the human

body: autoimmune skin disorders, breast skin disorders, gynecological skin disorders, nutritional skin disorders, endocrine skin disorders, vulvovaginal skin disorders, infectious skin disorders, skin cancer disorders, aging skin disorders, hair disorders and nail disorders. This was called survey questionnaire # 1.

Step 2. Creation of Panel A:

Panel A became participants in the study as described earlier. A spreadsheet of their contact information was created.

Step 3. Developing Survey for Delphi Study & Round 1:

Panel A was provided survey questionnaire # 1, through in-person communication by the researcher. The cover letter and informed consent was shared with Panel A members during that encounter. In order to verify and diversify the list of the skin disorders, this initial survey was reviewed by each member of this smaller Panel A. For each of the listed disorders, the members of the Panel A were asked to indicate whether the disorder is acceptable, should be deleted or should be edited. If a Panel A member indicated that the disorder should be edited, then they were asked to write the new edited version of the disorder. Finally each panel member was asked to write in any additional significant dermatologic disorders to be included in the list. This was considered as round 1 and concluded with development of survey questionnaire # 2. Panel A was also asked to identify/nominate possible faculty members from their department to participate in the study and support the creation of Panel B. The eligibility criteria for Panel B was shared with Panel A members to help recruit the eligible faculty members interested in participating in the study. Once the identification of eligible faculty members was completed, round 2 commenced.

Step 4. Creation of Panel B:

Panel B members became participants in the study as described earlier. A spreadsheet of their contact information was created.

Step 5. Pilot testing:

The research package consisting of cover letter for participating in the study with information about the purpose of the study, consent form, directions for the survey instrument and a copy of the survey instrument was provided to five medical faculty members (not the Panel B members) for readability, clarity, and to estimate length of time needed to complete the survey questionnaire # 2. It was identified to be legible and requiring a minimum of 15 and a maximum 30 minutes to complete the entire survey.

Step 6. Labeling of the Survey Instrument:

The finalized survey instrument was then labeled: survey questionnaire # 2. It included a place for the identification of the experts and their specialty. Instead of using their names on the survey, Panel B members were identified by their subspecialty and a number assigned to them. Additionally, the survey was formatted electronically subcategorizing the skin disorders under the area of their special organ system category.

Step 7. Round 2:

The research package was then shared with all the potential members of Panel B by the researcher. Panel B members were asked to rank the topics using a Likert scale of 1-5, one being the least important and five being the most important dermatological disorder to include in the curriculum. They were also given the opportunity to inquire about the significance of the research study and its future application. Participants were asked to send an email message to the researcher within one week of completion of the

survey to be included in the study. If it was not returned in that amount of time, the

researcher could potentially send them a reminder via their secure institutional email

address. If it was not returned in two weeks, it was excluded from the data collection.

After the researcher received all of the surveys, the median was calculated for each topic.

Step 8. Round 3:

In the next step, the survey instrument labeled survey questionnaire # 3 was

shared with all the participants of Panel B to re-rank the similar list of skin disorders as in

survey questionnaire #2. However, the round 3 survey instrument provided Panel B

participants with the controlled feedback of the rank that they gave for each item

previously as well as the median score of each disorder calculated by the ranking given

by Panel B to that disorder. If a participant's ranking of a particular disorder was very

different from the median, they were asked to reconsider their ranking or provide a

reason for ranking the topic either higher or lower than the median. Participants were

asked to complete their survey within one week. If it was not returned in that amount of

time, the researcher sent them a reminder via email. If it was not returned in two weeks, it

was excluded from the data analysis.

Step 9. Data Analysis:

Each round was analyzed separately. The median was sought for the ranking of

each disorder completed by utilizing 5-point Likert-scale.

Communication with Panel Members

The communication with Panel A and Panel B members consisted of an in-person

or a telephone meeting; a secure institutional electronic mailing system was also utilized

to communicate with all the members. However, the researcher preferred to deliver and

collect the research questionnaire in person to avoid any delays or discrepancies. This was secure, time efficient and cost effective as compared to traditional mailing.

Data Analysis

A characteristic feature of the Delphi Method is that the variation of judgments decreases from round to round and their consistency is improved. The implementation of the Delphi procedure requires a formalized mathematical or statistical apparatus that can analyze expert judgments (Pankratova & Malafeeva, 2012). The median was chosen as the preferred statistic because it allowed for scores that fall in the upper or lower half of the distribution. The median is less sensitive to extreme scores than the mean and consequently makes it a better measure than the mean, especially for highly skewed distributions (Murry & Hammons, 1995).

This strategic ranking of the clinically common and pertinent disorders via the experts through this method is expected to form the basis of developing an educational curriculum to engage residents in effectively learning about the hormonal influences on female skin conditions during their midlife (Nieman, Ruttenberg, Levison, Kuzma, Rudnitsky, 1997; Rambe & Mlambo, 2014). If the skin disorder enlisted in survey questionnaire #3 gained a median score of 2.5 or more after the completion of round 3 it was included in developing the future curriculum.

Statistical Methodology

Delphi surveys are primarily used to arrive at a consensus of opinion. For this reason the analysis of the data is completed by the utilization of statistics that reflect convergence around the median (Holden & Wedman, 1993). Since this method is utilized in fields of education, technology, politics and management, the method used for

statistical or mathematical analysis varies depending upon the nature of the research

(Pankratova & Malafeeva, 2012). For the purpose of this research study, once the survey

instruments were returned at the end of round 2, frequency and median scores of each

skin disorder were obtained. Data was then tabulated and presented to the panel members

in the form of medians for the content items. For each item, the panelists were provided

the following information to help them revise their rankings: the median rank of the

content item for the panel and the panelist's ranking of the item in the former round.

Based on the difference between these two numbers, the panelists were asked to revise

their rankings for each item (Okoli & Pawlowski, 2004).

At the end of these rounds, the final ranked list reflected the consensus from the panels

(A&B) of five different subspecialties representing the priorities that each of the panel

members placed on the disease topics to be taught. This rigorous process assured that the

topics in the list are the most important, and that the rankings were a valid indicator of the

relative significance of these topics (Okoli & Pawlowski, 2004). Simultaneously, there

were no social distractions or interactions among the panelists affecting their suggestions

and rankings.

Assumptions

It is assumed that this study is the first of its kind to lead towards identification

and potential incorporation of the missing competencies and knowledge on the subject of

hormonal and menopause-related skin disorders/diseases into the dermatology curriculum

at an institutional level (Ng, 2012; Philips et al, 2003). The curriculum to be primarily

designed for dermatology residents could be potentially utilized by gynecology,

rheumatology, internal and family medicine residents as well during their residency

training to enhance their women's health knowledge and to ignite future interest in this field. Instead of considering menopausal hormones and skin manifestations as an area of ambiguity in general clinical practice (Papa & Harasym, 1999; Redmond, 1995), the women's healthcare providers will be expected to develop a better understanding and articulation of the subject after reviewing this curriculum.

Limitations

The Delphi Method appears deceptively simple because it is relatively easy to formulate and iterate. However, the challenge lies in the formulation of the survey instrument, obtaining adequate feedback from the participants in each round, and for the iteration and statistical analysis to be correctly applied for getting appropriate consensus. (Philips et al, 2003). The results of the study could be influenced by a decrease in the number of participants in subsequent rounds of the survey (Murry & Hammons, 1995).

Summary

The hypothesis has been generated through the extensive medical literature review that teaching curriculum for dermatology residency training lacks the organized education on risk stratification of disorders of hair, nails and skin in the context of menopausal hormonal changes. The need was identified to prioritize the selective skin disorders most susceptible to such changes and commonly encountered in out-patient clinic settings by women's health practitioners.

The researcher created the initial list of such disorders after the comprehensive medical literature review. The eligible faculty members, of dermatology, gynecology, rheumatology, internal medicine and family medicine departments completed the ranking and prioritization of such disorders. The Delphi methodology was applied to collect the

data and median was used for its analysis. It was predicted that the four features of

Delphi methodology; anonymity, iteration, controlled feedback, and statistical

aggregation of group response would provide the most accurate consensus in this study,

on the disorders identified through the literature review. In future, the results of this study

could help develop a repository of educational materials pertaining to learning objectives,

skill sets, diagnostic criteria and treatment goals for these skin disorders, in the context of

fluctuating female hormones during and beyond surgical and natural menopause for

dermatology residents.

Chapter IV

The Results of the Delphi Study

The intent of this Delphi study was to identify and prioritize the skin disorders, potentially influenced by changes in hormones, during and beyond natural or surgical menopause. After a thorough literature review of existing menopause and dermatology curriculum and journal articles published on such skin disorders; survey questionnaire #1 (Table 2) was prepared by the researcher to share it with Panel A members for their expert feedback.

Table 2

Round 1 and Questionnaire #1: Dermatologic Disorders Influenced by Menopausal Hormone Changes

Topics	Subtopics	Add	Edit/Delete
Autoimmune Disorders	Discoid Lupus Systemic Sclerosis Psoriasis Vitiligo Pemphigoid Pemphigus Dermatomyositis CREST Syndrome		
Endocrine Disorders	Hirsutism Facial Acne Polycystic Ovarian Syndrome Acanthosis Nigricans Melasma Xanthelasma		
Gynecological Disorders	Lichen Sclerosis Vulvovaginal Atrophy Vaginal Lichen Planus Bacterial Vaginosis		
Breast Disorders	Paget's Disease Intertriginous Candidiasis		

Table 2 Continued

Topics	Subtopics	Add	Edit/Delete
Hair Loss Disorders	Alopecia Areata Telogen Effluvium Male Pattern Baldness		
Nail Disorders	Onychomycosis Onycholysis Distal Nail splitting		
Aging Skin Disorders	Wrinkles Photoaging Seborrheic keratosis Xerosis Acrochordon (skin tags)		
Oncologic Disorders	Basal cell carcinoma Squamous cell carcinoma Melanoma Bowen's disease		
Vascular Disorders	Rosacea Chronic Venous Insufficiency Changes Telangiectasia Cherry Angioma		
Infection Related Disorders	Herpes Simplex Hidradenitis Suppurativa Folliculitis Shingles		

Results of Round 1

Panel A experts, who met the inclusion criteria to participate in the research became the participants of round 1. Their participation was voluntary and consent forms were obtained; their names or any demographic information were not included on the survey instrument. The cover letter explaining the purpose of the study and instructions to complete the survey were shared with the participants. They were given an opportunity to ask the researcher any questions pertaining to the study design. However, their identification was kept anonymous to the other experts. The goal was to encourage them

to edit, delete or add topics or subtopics from the initial survey, utilizing their experience and background knowledge. At the completion of round 1, all five Panel A members had submitted their feedback. They did not delete any topics or subtopics. Furthermore, their feedback led to specific organization of categories and subcategories of these skin disorders pertaining to different organ systems of the human body. They assisted in not only adding more subtopics but also a category of "other disorders" for the skin conditions that could not be classified under any specific organ system, such as psoriasis. All these changes and additions were incorporated in the preparation of survey questionnaire #2 for round 2.

Table 3

Round 2 and Questionnaire #2: Dermatologic Disorders Influenced by Menopausal Hormone Changes

Topics	Subtopics	Strongly Disgree	Disagree	Neutral	Agree	Strongly Agree
Autoimmune Diseases	Discoid Lupus Systemic Sclerosis Vitiligo Pemphigoid Pemphigus Dermatomyositis CREST Syndrome Scleroderma					
Endocrine/ Metabolic Disorders	Hirsutism Hyperthecosis Acanthosis Nigricans Melasma Xanthomas Calcinosis Cutis					
Gynecological Disorders	Lichen Sclerosis Vulvovaginal Atrophy Vulvovaginal Lichen Planus Bacterial Vaginosis					

Table 3 Continued

Topics	Subtopics	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Yeast					
Breast Diseases	Paget's Disease Intertriginous Candidiasis Periductal Mastitis					
Hair Loss Disorders	Alopecia Aeata Telogen Effluvium Male Pattern Baldness Diffuse Hair Loss					
Nail Disorders	Onychomycosis Onycholysis Distal Nail Splitting Dytrophic Nails					
Aging Skin	Wrinkles Photoaging Seborheic Keratosis Xerosis Acrochordon (skin tags) Actinic Keratosis Thinning of Skin Purpura Bruising					
Oncologic Diseases	Basal Cell Carcinoma Squamous Cell Carcinoma Melanoma Bowen's Disease					
Vascular Diseases	Chronic Venous Insufficiency Changes Telangiectasia Cherry Angioma					
Infectious Diseases	Herpes simplex Perioral dermatitis Tinea Hidradenitis suppurativa Folliculitis Shingles					
Others	Psoriasis					

Table 3 Continued

Topics	Subtopics	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Dermatitis					
	Rosacea					
	Acne Vulgaris					

Labeling of the Survey Instrument

The finalized survey instrument was then labeled survey questionnaire # 2. This survey instrument is displayed in Table 3. Instead of using the names of the faculty on the survey, they were identified by their subspecialty and number assigned to them. The researcher documented on a separate spreadsheet this information for each Panel B participant. After completion of the data collection it was shredded to ensure confidentiality.

Results of Round 2

Panel B was inteded to be comprised of thirty faculty members consisting of 8 (27%) dermatologists, 7 (23%) gynecologists, 3 (10%) rheumatologists, 7 (23%) internists and 5 (17%) family physicians to assist with prioritization of clinically relevant dermatological disorders and diseases affecting menopausal women. However, two of the dermatologists did not meet the inclusion criteria. The research package was shared with a total of twenty-eight faculty members to invite them for voluntary participation in the research study. Furthermore, two of the faculty members from dermatology and one from gynecology did not accept the invitation.

The completed survey questionnaire #2 was thus collected from twenty-five faculty members. The participation rate of Panel B was 89%. The results of the ranking of each skin disorder on a Likert-scale of 1-5, by individual Panel B participants were entered on an Excel spreadsheet. The median was sought for the ranking of each disorder

scored by Panel B. It was noted that the median for each skin disorder was above 2.5 at the end of data analysis of the round 2. At this point, the results of the study indicated that each of the skin disorders listed in the survey had met the criteria to be pertinent and thus, qualified for future inclusion in the development of a focused curriculum for dermatology residents. However, in order to obtain convergence of results and maximize the consensus of opinion, round 3 commenced.

Table 4

Round 3 and Questionnaire 3: Dermatologic Disorders Influenced by Menopausal Hormone Changes

Topics	Subtopics	Median	Previous Rank	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Autoimmune diseases	Discoid Lupus	4						
	Systemic Sclerosis	3						
	Vitiligo	4						
	Pemphigoid	3						
	Pemphigus	3						
	Dermato-Myositis	3						
	Crest Syndrome	3						
	Scleroderma	3						
Endocrine/ Metabolic Disorders	Hirsutism	5						
	Hypertheco-sis							
		4						
	Acanthosis Nigricans	3						
	Melasma	4						
	Xanthomas	3						
	Calcinosis Cutis	3						
Gynecologic-al Disorders	Lichen Sclerosis	4						
	Vulvovagin-al Atrophy	5						
	Vulvo-Vaginal Lichen-Planus	4						
	Bacterial Vaginosis	3						
	Yeast	3						

Table 4 Continued

Topics	Subtopics	Median	Previous Rank	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Breast Diseases	Paget's Disease	3						
	Intertriginous-Candidiasis	3						
	Periductal Mastitis	3						
Hair loss disorders	Alopecia Areta	4						
	Telogen Effluvium	4						
	Male pattern Baldness	5						
	Diffuse Hair Loss	3						
Nail Disorders	Onycho-mycosis	3						
	Onycholysis	3						
	Distal Nail Splitting	4						
	Dystrophic Nails	4						
Aging Skin	Wrinkles	5						
	Photoaging	3						
	Seborrheic Keratosis	3						
	Xerosis	4						
	Acrochordon (skin tags)	3						
	Actinic Keratosis	3						
	Thinning of Skin	4						
	Purpura	3						
	Bruising	3.5						
Oncologic Diseases	Basal cell Carcinoma	3						
	Squamous Cell Carcinoma	3						
	Melanoma	3						
	Bowen's Disease	3						
Vascular Diseases	Chronic Venous Insufficiency Changes	3						

Table 4 Continued

Topics	Subtopics	Median	Previous Rank	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	Telangiectasia	3						
	Cherry Angioma	3						
Infectious Diseases	Herpes Simplex	3						
	Perioral Dermatitis	3						
	Tinea							
	Hidradenitis Suppurativa							
	Folliculitis							
	Shingles							
Others	Shingles							
	Psoriasis							
	Dermatitis							
	Rosacea							
	Acne Vulgaris							

Preparation of Survey Questionnaire # 3

The survey questionnaire # 2 was slightly altered by adding two more columns, in the Excel spreadsheet. The calculated median of each skin disorder at the conclusion of round 2 was entered next to that disorder in one of the columns. The second column was used to enter the individual participants' previous ranking of that skin disorder during round 2. This controlled feedback was shared in round 3 with Panel B participants to obtain consensus on ranking, for effective prioritization of significant skin disorders. This survey instrument was labeled, survey questionnaire # 3. This survey instrument is displayed in Table 4.

Table 5

Top Two Highly Ranked Skin Disorders in each Organ System Category

Topics	Subtopics	Median	
		Round 2	Round 3
Autoimmune Disorders	Discoid Lupus	4	4
	Vitiligo	4	4
Endocrine Disorders	Hirsutism	5	5
	Hyperthecosis	4	4
Gynecological Disorders	Vulvovaginal Atrophy	5	5
	Vaginal Lichen Planus	4	4
Breast Disorders	Paget's Disease	3	3
	Intertriginous Candidiasis	3	3
Hair loss disorders	Male Pattern Baldness	5	5
	Alopecia Areata	4	4
Nail Disorders	Distal Nail splitting	4	4
	Dystrophic Nails	4	4
Aging Skin Disorders	Wrinkles	5	5
	Thinning of skin	4	4
Oncologic Disorders	Basal Cell Carcinoma	3	3
	Squamous Cell Carcinoma	3	3
	Melanoma	3	3
	Bowen's Disease	3	3
Vascular Disorders	Chronic Venous Insufficiency Changes	3	3
	Telangiectasia		
Infectious Diseases	Hidradenitis Suppurativa	3	3
	Folliculitis	3	3
Others	Rosacea	4	4
	Acne Vulgaris	4	4

Survey questionnaire #3 included a place for the identification of the experts and their specialty. Instead of using their names on the survey, they were identified by their subspecialty and number assigned to them. The researcher documented this information for each Panel B participant. It was then shared with all twenty-five previous participants

from round 2, and they were asked to reconsider their ranking if it was significantly deviated from the median score of that skin disorder. In case they had extreme deviations and preferred to keep the similar rank, they were asked to provide a rationale for their low score.

Results of Round 3

The participation rate of Panel B in this round was 100%, and survey questionnaire #3 was collected from all twenty-five of the original participants of the study. The data was then analyzed. The individual results of the ranking of each skin disorder on 1-5 point Likert-scale by Panel B participants were entered on an Excel spreadsheet. The median was sought for the ranking of each disorder completed by Panel B. It was identified that the median for each skin disorder stayed above 2.5 at the end of data analysis of the round 3. At this point, by comparing the results of the median of rounds 2 and 3 of the study indicated that most of the skin disorders enlisted in the survey had displayed no significant change from the previously scored median. Only two skin disorders showed slight difference in the median, but convergence and the consensus of opinion were not significantly affected at the end of round 3.

Table 6

Skin Disorders with Highest Frequency of Ranking

| Topic	Subtopic	Ranking	Ranking Frequency
Endocrine Disorders	Hirsutism	5	25
Aging Skin Disorders	Thinning of Skin	4	20
Oncologic Disorders	Basal Cell Carcinoma Squamous Cell Carcinoma Melanoma Bowen's Disease	3	24

Significant Findings after Data Analysis of Round

The aggregate frequency of the highest score of five was calculated for each of the fifty-six skin disorders listed in the survey questionnaires # 2 and #3 to determine the most highly ranked skin disorders. Figure 1 displays the bar graph of the top ranked skin disorders by all the participants of Panel B.

Top Ranked Skin Disorders
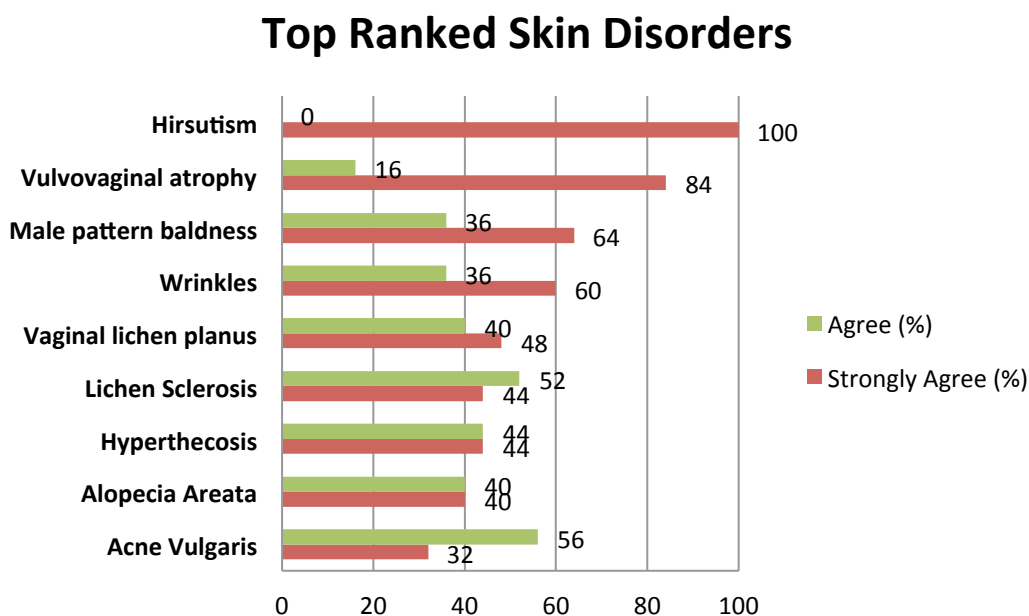
Figure 1. Top Ranked Skin Disorders

It was noted that hirsutism was ranked high by a majority of the participants, as the skin disorder most influenced by menopausal hormone changes followed by vulvovaginal atrophy. The data were also analyzed to determine if the high scores towards a certain organ system were skewed in correlation with faculty specializing in that specific area. However, no such trend was noted after analyzing the data. Figure 2 demonstrates that the frequency of top scores among different categories was highest for gynecologic disorders, followed by the endocrine- and age-related skin disorders, suggesting them to be most influenced by changes in hormones at menopause.
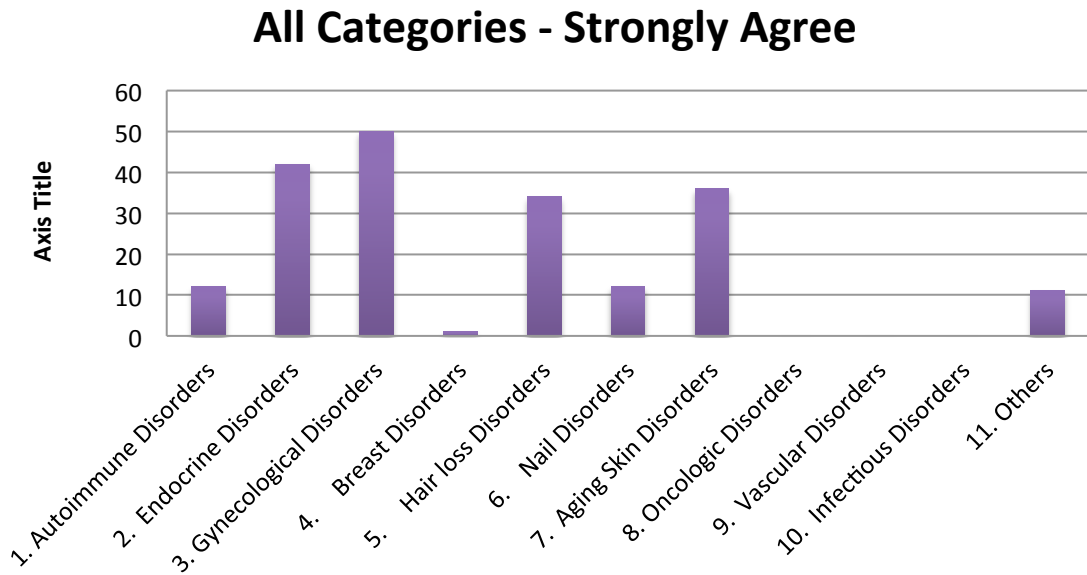
Figure 2. Gynecologic Disorders Ranked the Highest to be influenced by Hormones at Menopause.

Chapter V

Discussion

The specific problem that the present study addressed is that skin disorders are not classified or integrated into the menopause or dermatology curricula in the context of hormonal changes. This Delphi study was intended to obtain consensus from a selected group of experts on such skin disorders that could be most affected by changes in hormones at the time of menopause. The categories and subcategories of these skin disorders agreed upon by women's health experts may serve as a foundation to create interactive curricula and fill a gap in the existing medical literature.

Overview of the Problem and the Methodological Approach

The need to conduct this Delphi study was determined by completing a literature review and discussions with experts in the field of menopause and dermatology. It was identified that the significance and implications of hormone changes due to menopause on skin disorders are not well described in the medical literature or comprehensively taught to residents and trainees. A review of the literature in medical education suggested that very little, if any, efforts are made to classify, educate and manage dermatologic disorders in the context of patients' fluctuating hormonal milieu (Jiang et al, 2012). Yet in clinical practice, internists, endocrinologists, gynecologists, rheumatologists and dermatologists are consistently challenged by patients presenting with such skin diseases that could be managed effectively if gender- and age-related hormonal changes were factored into the clinical decision-making for treatment of those disorders.

The North American Menopause Society (NAMS) and the American College of Obstetricians and Gynecologists (ACOG) are the two major governing bodies promoting the research and education of menopause-related health issues. A current review of their published literature indicated that a significant number of repositories of evidence-based medical literature and consolidated learning materials on midlife preventive care and menopausal hormonal fluctuations affecting sexual, mental, cardiovascular, neurological, vulvovaginal, bone, and breast health has been developed. However, very scant and fragmented educational content is available on the impact of menopausal hormonal fluctuations on aging skin and pre-existing skin disorders at menopause. The Delphi study methodology was chosen to gain consensus from the experts in the field of women's health on skin disorders that should be included in the curriculum.

Summary of the Methodological Approach and Results

The researcher first conducted a medical literature review of journals, online articles, books, and published residency curricula to create a list of disorders pertinent to the research question, which were then entered into an Excel spreadsheet. These skin disorders were subcategorized according to different organ system categories of the human body such as autoimmune, endocrine, gynecological, breast, hair loss, nail, aging skin, oncologic, vascular and infection-related disorders manifesting as symptoms and diseases of the skin. This was called round # 1 and survey questionnaire # 1.

During the second phase of the study, experts who met the inclusion criteria of Panel A were recruited each from five disciplines of medicine and surgery from a single medical institution. The different fields of their specialization added diversity and broad scope of knowledge to the feedback they provided on survey questionnaire #1.

During round 1, survey questionnaire #1 was reviewed by Panel A members to add, delete or edit any of the categories or subcategories with an intention to finalize and prepare survey questionnaire # 2 for round 2 to be completed by Panel B members of the experts. The option to edit, add or delete the categories or subcategories was only given to Panel A in round 1. The five panelists of Panel A provided useful feedback in reorganizing and updating the classification of skin disorders in the initial questionnaire. Furthermore, a majority of members also suggested faculty members in their department who could participate in Panel B and provide their expert feedback to obtain consensus of opinion on the topics that should be included in the curriculum. The most significant feedback from Panel A experts pertained to not deleting any topics from the initial survey. Panel A reached this combined consensus of opinion that despite the fact that certain skin disorders like skin cancers apparently seem to have no correlation to hormonal influence at time of menopause, it is still appropriate to keep them in survey questionnaire # 2.

The next step was to incorporate the feedback from Panel A and finalize the questionnaire #2 to commence round 2. Initially it was intended to include eight dermatology faculty members in the round 2. However, two potential participants did not meet the inclusion criteria and only six of the faculty members were invited to participate in the study. Only four out of six dermatology faculty invited to the study responded to the invitation and agreed to participate. Among gynecology faculty as well, seven experts who met the inclusion criteria were invited to the study but only six agreed to participate. This led to a total of twenty-five out of twenty eight faculty members agreeing to participate in rounds 2 and 3 of the study and become Panel B experts. The participation

of these twenty-five Panel B experts was 100% in round 2 and 3.

Discussion of the Results of the Research

The results of this research study provided a profound insight into the significance and need of developing a curriculum around the potential influence of hormonal changes at menopause on identified normal and preexisting skin disorders. At the end of round 1, Panel A had expanded the list of disorders from 43 to a total of 56 skin disorders. In addition to thirteen new skin disorders added to the list, an eleventh category of "other disorders" was also created for skin conditions that could not be otherwise classified. Questionnaire #2 during round 2 (Table 3) gave Panel B the option to rank the fifty-six skin disorders on a Likert scale (1. Strongly disagree, 2. Disagree, 3 Neutral, 4. Agree, 5. Strongly Agree). In order to demonstrate a consensus of opinion, each skin disorder had to individually score a median of 2.5 or above to qualify for inclusion in the curriculum. After completion of round 2, the median calculated for each of the skin disorders ranked by the twenty-five members of Panel B was above 2.5.

The round 3-survey questionnaire provided Panel B participants with their individualized rank on each item as well as the median score for each disorder ranked by Panel B. If their ranking of a particular disorder was very different from the median, they were asked to reconsider their ranking or provide a reason for ranking the topic either higher or lower than the median. Two of the participants who had the most skewed rankings changed their ranks of the disorders to bring them closer to the median. However, one of the twenty-five participants who strongly disagreed on including a majority of the skin orders in the curriculum did not significantly change the rankings in round 3. In that participant's opinion he/she did not observe hormonal changes at

menopause to influence a majority of skin disorders listed in survey questionnaire # 2 and survey questionnaire # 3.

The 100% feedback of participants in round 3 strengthened the results of the study but as indicated in table 5, there were no significant changes in the previously obtained consensus at the end of round 3. As highlighted in Table 6, the skin disorder "Hirsutism" scored the highest convergence of consensus of all twenty-five experts, (rank-5) that it should become part of the curriculum. Twenty-four experts stayed neutral (rank-3) in their opinion to include skin cancers in the curriculum, one of them strongly disagreed to include it. Twenty experts were in agreement (rank-4) to include skin thinning in curriculum.

It was not surprising that the category of gynecological skin disorders scored the highest ranking; followed by endocrine and dermatological skin disorders (Figure 2), as it is already known that the female hormones have primary effect on female genitalia. However, the infectious, vascular and oncological skin disorders consistently ranked lowest among other eleven categories. Furthermore, Table 5 displays the top two highly ranked skin disorders in each of the eleven categories. It adds to the significance of the study and assisting physicians to identify the skin disorders most influenced by hormonal fluctuations, within each of the main eleven categories.

These results have assisted in determining the consensus of the medical and surgical women's health specialists on such dermatologic skin disorders, affected most by menopausal hormonal fluctuations. It has also helped identify the list of skin disorders in the order of priority to be included in the curriculum, determined by how frequently the experts in Panel B highly ranked it (figure. 1). The top five skin disorders were identified

to be hirsutism, vulvovaginal atrophy, male pattern baldness, wrinkles and vulvovaginal

lichen planus. The Panel A and B participants were kept anonymous to the suggestions

and rankings of other experts and only in round 3 controlled feedback was provided to

the panelists to reconsider their initial ranking, in case it was significantly skewed from

the median scores. However, their re-ranking did not further improve the consensus on

the topics that was already obtained in round 2.

Limitations of the Study

There were limitations in the number of faculty members to be recruited to serve

on Panel B due to following reasons:

1. The inclusion and exclusion criteria for invitation to participate.

2. Recruitment of the experts from a single medical institute.

 This led to subsequent additional limitation of unequal sample sizes of

participants from different medical and surgical disciplines. Therefore, the data analysis

(i.e., outcomes) only provided a limited insight in comparison to how each of the five

medical and surgical subspecialties perceived the ranking of skin disorders caused by

diseases of different organ systems of the body. However, the results of the analysis did

not reflect higher rankings of the skin disorders due to the specific area of practice of the

participating faculty.

Conclusion

In conclusion, the need for curriculum enrichment has been identified during and

at the completion of this Delphi study by the ranking and feedback given by the majority

of the thirty faculty members participating as Panel A and Panel B in the study. This

entails bringing in more knowledge and resources into a preexisting curriculum to teach

the medical students and residents about the influence of hormone changes at menopause on skin disorders prioritized via this Delphi study. The results of this Delphi study can be utilized to extend the core curriculum by restoring the excitement of teaching the same known skin disorders, but in the context of hormonal changes at menopause. It can reinforce the same concepts and knowledge with broader application and understanding of effects of age, gender and hormones on common skin disorders. This understanding can further potentially assist in correctly risk-stratifying patients to be treated or not treated by hormone replacement therapy at menopause.

Recommendations

The high consensus of opinion gained from this Delphi study indicates that development of a specialized curricula can assist with better understanding of the menopausal hormonal pathophysiology and its impact on the diagnosis, treatment and prognosis of the identified and prioritized skin disorders. Therefore, the completion of this study is a significant step towards the future formulation and implementation of an educational repository for teaching the medical students and residents. It should be comprised of learning opportunities, educational materials, and clinical modules, parallel and consistent with the needs and demands of present and future patient population statistics, both nationally and internationally.

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Appendix A

UH IRB Approval Letter

UNIVERSITY of **HOUSTON**
DIVISION OF RESEARCH

April 11, 2016

Sobia Khan
c/o Dr. Bernard R. Robin
Curriculum and Instruction

Dear Sobia Khan,

Based upon your request for exempt status, an administrative review of your research proposal entitled "IDENTIFICATION AND PRIORITIZATION OF DERMATOLOGICAL CONDITIONS INFLUENCED BY FEMALE HORMONAL FLUCTUATIONS DURING AND BEYOND MENOPAUSE" was conducted on March 11, 2016.

At that time, your request for exemption under **Category 2** was approved pending modification of your proposed procedures/documents.

The changes you have made adequately respond to the identified contingencies. As long as you continue using procedures described in this project, you do not have to reapply for review. * Any modification of this approved protocol will require review and further approval. Please contact me to ascertain the appropriate mechanism.

If you have any questions, please contact Alicia Vargas at (713) 743-9215.

Sincerely yours,

Kirstin Rochford, MPH, CIP, CPIA
Director, Research Compliance

*Approvals for exempt protocols will be valid for 5 years beyond the approval date. Approval for this project will expire **April 10, 2021**. If the project is completed prior to this date, a final report should be filed to close the protocol. If the project will continue after this date, you will need to reapply for approval if you wish to avoid an interruption of your data collection.

Protocol Number: 16326-EX

316 E. Cullen Building   Houston, TX 77204-2015   (713) 743-9204   Fax: (713) 743-9577

COMMITTEES FOR THE PROTECTION OF HUMAN SUBJECTS.

Appendix B

The Cover Letter

"This project has been reviewed by the University of Houston Committee for the protection of Human Subjects (713) 743-9204".

UNIVERSITY OF HOUSTON CONSENT TO PARTICIPATE IN RESEARCH

PROJECT TITLE: "IDENTIFICATION AND PRIORITIZATION OF DERMATOLOGICAL DISORDERS INFLUENCED BY FEMALEHORMONAL FLUCTUATIONS DURING AND BEYOND MENOPAUSE"

You are being invited to participate in a research project conducted by Dr. Sobia Khan MD from the general internal medicine department of ███████████████, doctorate student at the University of Houston. The University of Houston faculty member Dr. Bernard Robin PhD is the designated sponsor of this thesis research project.

NON-PARTICIPATION STATEMENT

Your participation is voluntary and you may refuse to participate or withdraw at any time without penalty or loss of benefits to which you are otherwise entitled. You may also refuse to answer any question.

PURPOSE OF THE STUDY

The need has been identified to develop a curriculum for learning of dermatology residents based on the relationship of skin disorders to age, gender and hormonal variations of menopausal women. The knowledge about how to evaluate and manage certain skin conditions in the midst of aging and hormonal fluctuations is not being classified and consolidated in the current residency dermatology curriculum. This study will employ the expert opinions of leaders in different medical specialties at ███████ ████████████ in identifying the key dermatologic disorders most influenced by hormones in menopausal women. The findings

of this study will be used as the basis for the development of a focused curriculum for dermatology residents. This study is expected to be completed in 4-6 weeks from the date the protocol is approved by the University of Houston and ▉▉▉▉▉▉▉▉ ▉▉▉▉▉ IRB.

PROCEDURES

You will be one of approximately thirty-five subjects at ▉▉▉ ▉▉▉▉▉▉▉▉▉▉ to be asked to participate in this project

Following steps comprise this research endeavor.

1. The researcher will prepare the initial survey questionnaire through medical literature review and will label it "survey questionnaire # 1".

2. During Round 1, the identified eligible Panel A members will be given "survey questionnaire # 1" through in person communication by the researcher. This survey will

"This project has been reviewed by the University of Houston Committee for the protection of Human Subjects (713) 743-9204".

be given to each member of this smaller panel in order to verify the list of disorders and to provide for the addition of any other disorders. For each of the listed disorder the members of the Panel A will be asked to indicate whether the disorder should be added, deleted or edited for the preparation of survey questionnaire #2. If the panel A member indicates that the disorder should be edited, then they will be asked to write the new edited version of the disorder. Finally each panel member will be asked to share any additional significant dermatologic disorders that are pertinent to be included in the list of subtopics.

3. After compiling the feedback from Panel A, the Round 1 will conclude with development of "survey questionnaire # 2."

4. During Round 2, the identified eligible members of Panel B will be approached in person by the researcher and "survey questionnaire #2" will be shared with them. They will be asked to rate the topics using a Likert scale of 1-5, one being the least important and five being the most important dermatological conditions to include in the curriculum. They will also be given the opportunity to inquire about the significance of the research study and its future application etc.

5. Participants will be asked to send an email message to researcher within one week of completing the survey for in person pick up of the package. If it is not returned in that amount of time, the researcher will contact them via their secure institutional email address. If it is not returned in two weeks, it will not be included in the data collection. After the researcher receives all of the surveys, the median will be calculated for each topic.

6. During the Round 3, the survey instrument labeled "survey questionnaire # 3 will be in person delivered to all 30 experts in Panel B to prioritize the list of disorders using a Likert scale of 1-5 as described above. The Round 3 instrument will provide Panel B participants with the score that they gave for each item at the end of Round 2, as well as the median that was given to that disorder by the entire group. If his/her ranking of a particular topic is very different from the median, they will be requested to reconsider their ranking or provide a reason for ranking the topic either higher or lower than the median. Participants will be asked to complete their survey within one week. If it is not returned in that amount of time, the researcher will contact them via email. If it is not returned in two weeks, it will not be included in the data analysis.

7.   Each round will be analyzed separately. The median will be sought for the Likert-scaled dermatologic topics and sub-topics of the survey to determine importance of the topics and subtopics pertaining to diseases and disorders to be included in a residency curriculum. The dermatological disorders scoring median rank of 2.5 and above will be considered pertinent to be utilized towards development of a focused curriculum for dermatology residents.

8.   After the completion of the study any identifiers will be destroyed. They will not be reused or disclosed to (shared with) any other person or entity, except as required by law, for authorized oversight of the research study, or for other research for which the use or disclosure of the identifier would be permitted under the Privacy Rule.

"This project has been reviewed by the University of Houston Committee for the protection of Human Subjects (713) 743-9204".

- Total time commitment for participation in each round will be 30 minutes. Each member of the Panel A will be committing total thirty minutes of participation. Each member of the Panel B will be committing total sixty minutes of participation.

CONFIDENTIALITY

Your participation in this project is voluntary. Please do not write your name on any of the research materials to be returned to the principal investigator.

RISKS/DISCOMFORTS

There are no foreseeable risks or discomforts associated with this study.

BENEFITS

There are no direct individual benefits associated with this study. However, your participation in this study may provide educational benefits in regards to future development and improvement of dermatology residency curriculum.

ALTERNATIVES

Participation in this project is voluntary and the only alternative to this project is non- participation.

INCENTIVES/REMUNERATION

No incentives/remuneration for the participants are associated with this project.

PUBLICATION STATEMENT

The results of this study may be published in professional and/or scientific journals. It may also be used for educational purposes or for professional presentations. However, no individual subject will be identified.

If you have any questions, you may contact Dr. Sobia Khan MD at 281-627-8300 or sobia.khan@bcm.edu. You may also email Dr. Bernard Robin faculty sponsor, at brobin@central.uh.edu ANY QUESTIONS REGARDING YOUR RIGHTS AS A RESEARCH SUBJECT MAY BE ADDRESSED TO THE UNIVERSITY OF HOUSTON COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS (713-743-9204).

"This project has been reviewed by the University of Houston Committee for the protection of Human Subjects (713) 743-9204".

Principal Investigator's Name:

_____

Signature of Principal Investigator:

_____

Appendix C

Questionnaire 1, 2 & 3

Speciality

"Round 1 & Questionnaire# 1": Dermatologic Disorders Influenced by Menopausal Hormone Changes			
Topics	**Subtopics**	**Add**	**Edit/Delete**
1. Autoimmune Disorders	a. Discoid Lupus		
	b. Systemic Sclerosis		
	c. Psoriasis		
	d. Vitiligo		
	e. Pemphigoid		
	f. Pemphigus		
	g. Dermatomyositis		
	h. CREST syndrome		
2. Endocrine Disorders	a. Hirsutism		
	b. Facial Acne		
	c. Polycystic ovarian syndrome		
	d. Acanthosis Nigricans		
	e. Melasma		
	f. Xanthelasma		
3. Gynecological Disorders	a. Lichen Sclerosis		
	b. Vulvovaginal atrophy		
	c. Vaginal lichen planus		
	d. Bacterial Vaginosis		
4. Breast Disorders	a. Paget's Disease		
	b. Intertriginous candidiasis		
5. Hair Loss Disorders	a. Alopecia Areata		
	b. Telogen Effluvium		
	c. Male pattern baldness		
6. Nail Disorders	a. Onychomycosis		
	b. Onycholysis		
	c. Distal Nail splitting		
7. Aging Skin Disorders	a. Wrinkles		
	b. Photoaging		
	c. Seborrheic keratosis		
	d. Xerosis		
	e. Acrochordon (skin tags)		
8. Oncologic Disorders	a. Basal cell carcinoma		
	b. Squamous cell carcinoma		
	c. Melanoma		
	d. Bowen's disease		
9. Vascular Disorders	a. Rosacea		
	b. Chronic venous insufficiency changes		
	c. Telangectasia		
	d. Cherry angioma		
10. Infection Related Disorders	a. Herpes simplex		
	b. Hidradenitis suppurativa		
	c. Folliculitis		
	d. Shingles		

Specialty: _____ Participant #: _____

"Round 2 & Questionnaire # 2": Dermatologic Disorders Influenced by Menopausal Hormone Changes						
Topics	**Subtopics**	**1. Strongly Disagree**	**2. Disagree**	**3. Neutral**	**4. Agree**	**5. Strongly Agree**
1. Autoimmune Diseases	a. Discoid Lupus					
	b. Systemic Sclerosis					
	d. Vitiligo					
	e. Pemphigoid					
	f. Pemphigus					
	g. Dermatomyositis					
	h. CREST syndrome					
	i. Scleroderma					
2. Endocrine/ Metabolic Disordes	a. Hirsutism					
	b. Hyperthecosis					
	c. Acanthosis Nigricans					
	d. Melasma					
	e. Xanthomas					
	f. Calcinosis Cutis					
3. Gynecological Diseases	a. Lichen Sclerosis					
	b. Vulvovaginal atrophy					
	c. Vulvovaginal lichen planus					
	d. Bacterial Vaginosis					
	f. Yeast					
4. Breast Diseases	a. Paget's Disease					
	b. Intertriginous candidiasis					
	c. Periductal Mastitis					
5. Hair loss disorders	a. Alopecia Areata					
	b. Telogen Effluvium					
	c. Male pattern baldness					
	e. Diffuse Hair Loss					
6. Nail Disorders	a. Onychomycosis					
	b. Onycholysis					
	c. Distal Nail splitting					
	c. Dytrophic Nails					
7. Aging Skin	a. Wrinkles					
	b. Photoaging					
	c. Seborrheic keratosis					
	d. Xerosis					
	e. Acrochordon (skin tags)					
	f. Actinic Keratosis					
	g. Thinning of skin					
	h. Purpura					
	i. Bruising					
8. Oncologic Diseases	a. Basal cell carcinoma					
	b. Squamous cell carcinoma					
	c. Melanoma					
	d. Bowen's disease					
9. Vascular Diseases	b. Chronic venous insufficiency changes					
	c. Telangectasia					
	d. Cherry angioma					
10. Infectious Diseases	a. Herpes simplex					
	b. Perioral dermatitis					
	c. Tinea					
	d. Hidradenitis suppurativa					
	e. Folliculitis					
	f. Shingles					
11. Others	a. Psoriasis					
	b. Dermatitis					
	c. Rosacea					
	d. Acne vulgaris					

Topics	Subtopics	Median	Previous Rank	1. Strongly Disagree	2. Disagree	3. Neutral	4. Agree	5. Strongly Agree
	"Round 3 & Questionnaire # 3": Dermatologic Disorders Influenced by Menopausal Hormone Changes							
1. Autoimmune Diseases	a. Discoid Lupus	4						
	b. Systemic Sclerosis	3						
	d. Vitiligo	4						
	e. Pemphigoid	3						
	f. Pemphigus	3						
	g. Dermatomyositis	3						
	h. CREST syndrome	3						
	i. Scleroderma	3						
2. Endocrine/ Metabolic Disordes	a. Hirsutism	5						
	b. Hyperthecosis	4						
	c. Acanthosis Nigricans	3						
	d. Melasma	4						
	e. Xanthomas	3						
	f. Calcinosis Cutis	3						
3. Gynecological Diseases	a. Lichen Sclerosis	4						
	b. Vulvovaginal atrophy	5						
	c. Vulvovaginal lichen planus	4						
	d. Bacterial Vaginosis	3						
	f. Yeast	3						
4. Breast Diseases	a. Paget's Disease	3						
	b. Intertriginous candidiasis	3						
	c. Periductal Mastitis	3						
5. Hair loss disorders	a. Alopecia Areata	4						
	b. Telogen Effluvium	4						
	c. Male pattern baldness	5						
	e. Diffuse Hair Loss	3						
6. Nail Disorders	a. Onychomycosis	3						
	b. Onycholysis	3						
	c. Distal Nail splitting	4						
	c. Dytrophic Nails	4						
7. Aging Skin	a. Wrinkles	5						
	b. Photoaging	3						
	c. Seborrheic keratosis	3						
	d. Xerosis	4						
	e. Acrochordon (skin tags)	3						
	f. Actinic Keratosis	3						
	g. Thinning of skin	4						
	h. Purpura	3						
	i. Bruising	3.5						
8. Oncologic Diseases	a. Basal cell carcinoma	3						
	b. Squamous cell carcinoma	3						
	c. Melanoma	3						
	d. Bowen's disease	3						
9. Vascular Diseases	b. Chronic venous insufficiency chang	3						
	c. Telangectasia	3						
	d. Cherry angioma	3						
10. Infectious Diseases	a. Herpes simplex	3						
	b. Perioral dermatitis	3						
	c. Tinea	3						
	d. Hidradenitis suppurativa	3						
	e. Folliculitis	3						
	f. Shingles	3						
11. Others	a. Psoriasis	3						
	b. Dermatitis	3						
	c. Rosacea	4						
	d. Acne vulgaris	4						