



Reflex Sympathetic Dystrophy awareness
by Judith Scott Nicoll

A thesis submitted in partial fulfillment Of the requirements for the degree of Master of Nursing
Montana State University
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Abstract:

An estimated six million people in the United States have been diagnosed with Reflex Sympathetic Dystrophy, a poorly understood symptom complex. In the absence of early intervention, this disorder progresses rapidly to an irreversible, debilitating condition. There is a perceived lack of understanding among health care providers suggested by advocates for the disorder, people with the disorder, and pertinent literature. No published research was identified to validate the perceived lack of understanding.

The purpose of this study was to: a) describe the level of awareness about Reflex Sympathetic Dystrophy among Advanced Practice Registered Nurses in Montana, and b) identify key factors (e.g. education, years of practice, etc.) that are related to the awareness of Reflex Sympathetic Dystrophy. All Advanced Practice Nurses (N=317) were sent a mail questionnaire developed by the researcher.

The response rate was 70.9 percent. Seventy-seven percent of responders had a “poor” awareness about the syndrome. Associated factors in the study were: field of expertise, previous education on Reflex Sympathetic Dystrophy, and gender. The certified nurse anesthetists had the highest level of awareness regarding the disorder.

This study provided the first systematic validation that there is a lack of awareness about RSD among a group of health care providers.

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by

Judith Scott Nicoll

A thesis submitted in partial fulfillment
Of the requirements for the degree

of

Master of Nursing

MONTANA STATE UNIVERSITY-BOZEMAN
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This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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VITA

Judith Scott Nicoll, the daughter of George and May Nicholson, was born July 16th, 1962, in New Jersey. She received her secondary education from Collingswood High School in Collingswood, New Jersey. She graduated from Presbyterian University of Pennsylvania in 1981 with a Licensed Practical Nursing degree. The Montana bug bit her in 1984 and she began her journey west. She graduated from Montana State University with a Bachelor of Science in Nursing in 1987.

Employment included positions as a traveling nurse and staff nurse in rural hospitals in Montana, Wyoming, and Idaho. The majority of time spent in nursing was in small rural hospitals in Montana. One of her greatest achievements was developing a hospice program for a small rural town in Montana. A Master of Nursing degree from Montana State University was completed in August, 1999.

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Finally, I dedicate this thesis to my father-in-law, Dr. G.S. Nicoll. My personal experience with Reflex Sympathetic Dystrophy was successfully treated due to his early recognition of the condition. His dedication to the medical profession has been an inspiration and his love and understanding made the completion of this goal possible.

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ABSTRACT

An estimated six million people in the United States have been diagnosed with Reflex Sympathetic Dystrophy, a poorly understood symptom complex. In the absence of early intervention, this disorder progresses rapidly to an irreversible, debilitating condition. There is a perceived lack of understanding among health care providers suggested by advocates for the disorder, people with the disorder, and pertinent literature. No published research was identified to validate the perceived lack of understanding.

The purpose of this study was to: a) describe the level of awareness about Reflex Sympathetic Dystrophy among Advanced Practice Registered Nurses in Montana, and b) identify key factors (e.g. education, years of practice, etc.) that are related to the awareness of Reflex Sympathetic Dystrophy. All Advanced Practice Nurses (N=317) were sent a mail questionnaire developed by the researcher.

The response rate was 70.9 percent. Seventy-seven percent of responders had a "poor" awareness about the syndrome. Associated factors in the study were: field of expertise, previous education on Reflex Sympathetic Dystrophy, and gender. The certified nurse anesthetists had the highest level of awareness regarding the disorder. This study provided the first systematic validation that there is a lack of awareness about RSD among a group of health care providers.

CHAPTER 1

INTRODUCTION

Reflex Sympathetic Dystrophy (RSD) is a poorly understood symptom complex that affects the nerves, muscles, skin, bones, and in late stages, internal organs of the body. The effects of this disorder are both complicated and devastating, but it is the lack of knowledge among health care providers that may be of greater concern. Initial symptoms may be subtle and associated with injuries ranging from minor to severe. Misdiagnosis is common, and in the absence of crucial early intervention, this disorder progresses rapidly to an irreversible, debilitating condition.

Reflex Sympathetic Dystrophy is complicated by a number of factors including confusing and conflicting results about the etiology, pathophysiology, defining characteristics, and treatment plan (Fournier & Holder, 1998). To further confuse the issue, the name of the condition has changed repeatedly over the past 100 years (Walker, 1997). Despite the complicating factors, many researchers believe that the prevalence of this condition is much greater than presently acknowledged (Borg, 1996). An estimated six million people in the United States have been diagnosed with RSD (Hendler, 1996). In a recent study of patients diagnosed with the disorder between 1993

and 1996, only 46 states acknowledged having such cases. Montana was 1 of the 4 states without reported cases (Reflex Sympathetic Dystrophy Association, 1998); consequently there are no statistical data available to determine the incidence of the condition in Montana.

The lack of empirical information regarding the incidence of RSD in Montana is disturbing. A spokesperson for a pain clinic in the Gallatin Valley of Bozeman, Montana, reported an estimated 25 persons per year seek treatment for RSD at their clinic. A clinic representative stated, "These patients feel alone and believe their condition is poorly understood by the medical community" (J. C. Reese, personal communication, January 11, 1999).

Advanced Practice Registered Nurses (APRN) may be the first contact for persons with subtle symptoms associated with RSD. It is the role of a nurse practitioner to diagnose, treat, and manage a wide array of acute and chronic health conditions. Therefore, it is essential for nurse practitioners to recognize early signs of this syndrome and to assure a precise diagnosis, treatment, and/or referral to prevent an irreversible disability.

Purpose

The goal of this study was to determine if the awareness of Reflex Sympathetic Dystrophy displayed by Advanced Practice Registered Nurses in Montana is consistent with the perceived lack of understanding suggested by advocates for the disorder, people with the disorder, and pertinent literature.

The purpose of this research was to:

- (1) Describe the level of awareness about Reflex Sympathetic Dystrophy among Advanced Practice Registered Nurses in Montana.
- (2) Identify key factors (e.g. education, years of practice, etc.) that are related to the awareness of Reflex Sympathetic Dystrophy.

Significance of Study

Perceived Lack of Knowledge

No published research was identified to support a lack of knowledge about RSD among health care providers. Although, researchers and patient advocates often make reference to a perceived lack of knowledge about the disorder. This lack of knowledge is said to lead to overuse of pain medications and a delayed accurate diagnosis (Peck, 1998).

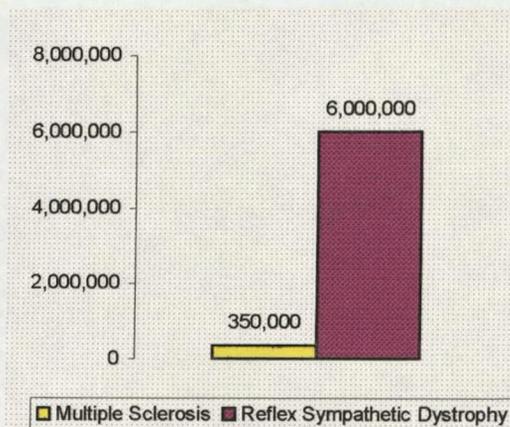
A variety of resources for those who have been diagnosed with RSD are available through literature, published information from the national RSD Association, and the Internet. The Internet is a primary source for the public to obtain information about the syndrome. Many support groups and independent web pages are filled with advice from persons afflicted with this condition. Several publications written by persons diagnosed with RSD suggested an “insensitivity” and “lack of knowledge” for their condition by health care providers. Several persons ultimately diagnosed with RSD described years of being shuttled between specialists without a diagnosis or effective

treatment. By the time the condition was properly diagnosed, it had advanced to a point where treatment was difficult, expensive, and ineffective. In a real-time computer chat room, anger and distrust towards the health care system were verbalized as persons diagnosed with RSD described their physical limitations, loss of income, and disruption of the family unit related to the poorly understood condition (F. Bauer, K. Haags, R. Hartley, J. Reid, & F. Schaeffers, personal communication, September 4, 1998).

Magnitude of the Disorder Nationally

It is difficult to understand the significance associated with the estimated six million people in the United States diagnosed with RSD. In order to illustrate the relevance of RSDs' perceived lack of awareness, a more recognizable condition was used for comparison. Although multiple sclerosis (MS) and RSD are not related, they have similar affects on the bodies ability to function; both can progress to irreversible, debilitating conditions. It is believed that MS has greater public awareness, but as can be seen from Figure 1, RSD has a significantly higher rate of prevalence nationally.

Figure 1. Estimated National Prevalence of Multiple Sclerosis vs. Reflex Sympathetic Dystrophy (RSDA, 1998; National Multiple Sclerosis Society, 1997).



An estimated 8,000 new cases of MS are reported every year in the United States. It is claimed that MS is the third most common cause of disabling illness in persons between the ages of 15 and 50 years (National Multiple Sclerosis Society, 1997). If this is the case, then RSD could be considered to be of epidemic proportions. This assumption, however, is complicated by the fact that it is so poorly understood, recognized, and researched.

Magnitude of the Disorder in Montana

Due to the lack of statistical information about the RSD in Montana, tentative assumptions were made based on the identification of approximately 25 persons with the diagnosis of RSD who seek care at one clinic in the state. Based on this finding, the probability that more cases exist throughout the state is conceivable. This study was the first step in the acquisition of information regarding the awareness of the disorder among a group of health care providers in the state.

CHAPTER 2

LITERATURE REVIEW

CINAHL and MEDLINE computer databases were used to identify relevant research. Both databases collectively yielded approximately 300 publications. Out of appropriate research publications, one nursing research study dealing with Reflex Sympathetic Dystrophy (RSD) in the pediatric patient was identified with the remainder being medical research exploring specific diagnostic issues and treatments.

History

The first documentation of RSD was by Weir Mitchell during the American Civil War (1861-1865). Mitchell and his associates identified this condition when it resulted from the trauma of gunshot injuries. The book Gunshot Wounds and Other Injuries of Nerves (Mitchell, Moorehouse, & Keen, 1864) contained an account of the signs and symptoms of peripheral nerve injuries as observed in soldiers at Turners Alne Hospital for Nervous Diseases in Philadelphia. An abbreviated quotation of their description follows:

In our experience of nerve wounds, we met with a small number of men reporting 'red-hot rasping of the skin' The seat of burning pain is very various; but its favored site is the foot or hand. In these parts it is to be found most often wherethe nutritive skin-changes are met with; Its intensity varies from the most trivial burning to a state of torture, which can hardly be credited, but which reacts on the whole economy, until the general health is seriously affected. The part of itself is not alone subject to deep burning sensation, but becomes exquisitely hyperesthetic, so that touch or tap of the finger causes pain The sleep is restless, and the constitutional condition, reacting on the wounded limb, exasperates the hyperestic state so that the rattling of a newspaper, a breath of air, the step of another across the ward, the vibrations caused by military band, or the shock of the feet in walking, gives rise to an increase of pain (Mitchell et al., 1864, p. 289).

The term "causalgia" was given to this condition from the Greek words kausis (heat) and algos (pain) (Hooshmand, 1993). The term causalgia came from a combination of Weir Mitchell's (1864) work as well as that of Sir James Paget. Paget (1864) described the "glossy fingers, which are usually tapering, smooth, hairless, almost void of wrinkles, pink . . . always associated with distressing and hardly manageable pain and disability" (Bonica, 1979, p. 162). Mitchell's early contributions were recognized when his work was reprinted by the American Academy of Neurology in 1965 (Hooshmand, 1993). In 1943 the term "reflex dystrophy" was first used to describe painful changes in upper extremity tissue produced by "circulatory and neural disturbances provoked by trauma" (Bonica, 1979, p.162). Throughout the years researchers have utilized other terms, such as traumatic dystrophy, minor causalgia, algoneurodystrophy, shoulder-hand syndrome, and Sudecks atrophy, to describe RSD (Bonica, 1979). The most recent term used to define the condition is Complex Regional Pain Syndromes (CRPS) I and II (Stanton-Hicks, Janig, Hassenbusch, Haddock, Boas, & Wilson, 1995).

Pathophysiology.

While research on RSD is limited (Greipp, 1990), it is known that it affects all age groups, all races, and both genders at similar rates (Campbell, Meyer, & Raja, 1992). It seems to be triggered by either minor or major trauma. According to Schwartzmann (1993), the majority of cases are secondary to fractures, sprains, and soft tissue crushing injuries. While some cases are associated with an identifiable nerve injury, many are not. There are extremely rare cases of the syndrome related to head injury, stroke, polio, amyotrophic lateral sclerosis, myocardial infarction, operative procedures, and prolonged bed rest (Schwartzmann, 1993).

No single hypothesis explains all the features of RSD. Schwartzmann (1993) stated that a common mechanism might be injury to either central or peripheral neural tissue. Roberts (1986) proposed that sympathetic-maintained pain resulted from tonic activity in myelinated mechanoreceptor afferents. The input causes tonic firing in neurons that are part of a nociceptive pathway. Campbell et al. (1992) proposed a hypothesis which places the primary abnormality in the peripheral nervous system. Hardy & Hardy (1997) described RSD as an unsolved "puzzle", whereby they took all the pieces of the mechanism puzzle and categorized them into peripheral, spinal, and supraspinal (Hardy & Hardy, 1997).

Clinical Signs and Symptoms.

The clinical signs are often ambiguous and create a difficult task for an accurate diagnosis. There are no recognized criteria for diagnosing RSD (Pittman & Belgrade, 1997). Lankford (1990) described the key signs and symptoms as: (a) edema and skin discoloration, (b) demineralization and osteoporosis, (c) pseudomotor changes, (d) vasomotor instability, and (e) burning pain and stiffness.

Edema and skin discoloration are usually one of the earliest findings. Edema may involve the entire extremity, and the discoloration may vary from intensely red to cyanotic, pale, purple, or gray (Lankford, 1990). Demineralization and osteoporosis are among the most "classic" findings and are both late findings (Schwartzmann, 1993). Pseudomotor changes vary from hyperhidrosis to dryness; temperature differences between affected and unaffected extremities may be noted. Vasomotor instability is most commonly manifested as decreased capillary refill, and the skin may develop a glossy, shiny appearance. In the late stages of the condition, trophic changes may involve a decrease in subcutaneous tissue (Lankford, 1990).

Symptoms include pain and stiffness. Pain is intense and burning, is out of proportion to the injury, and may affect the entire extremity. There is pain with light touch termed "allodynia." Movement frequently, but not always, aggravates pain. Sufferers describe exacerbations with cold, and many feel worse when a low-pressure weather front is noted. Airplane ascent and descent can be painful. A predisposing personality of depression was suggested in much of the RSD literature. While a majority of persons with the disorder are depressed, other studies have demonstrated that they are depressed because of their pain (Peck, 1998).

Throughout the years researchers have attempted to put the signs and symptoms in a recognizable order by utilizing stages of the disease process. These stages are primarily for communication among health care providers and insurance companies. Ordinarily, patients do not clearly pass from one stage to the next at a specific time. Each patient has different symptoms and different intensities of symptoms at different times. It is rare to see a patient exhibiting all of the symptoms in each stage. The only common denominator in all patients is pain. The recognized three stages identified by the RSD

Association include: (a) stage 1-the acute stage, (b) stage 2-the dystrophic stage, and (c) stage 3-the atrophic stage. All stages have distinguishing characteristics with the duration of stage 1 lasting approximately three months and stage 2 lasting from three to six months. It is believed that once stage 3 has been reached RSD becomes a progressive chronic condition (Reflex Sympathetic Dystrophy Association, 1996) (see Table 1).

Table 1. Stages of Reflex Sympathetic Dystrophy.

Stage 1 (Acute)	Stage 2 (Dystrophic)	Stage 3 (Atrophic)
1. Onset of severe burning pain limited to the site of injury	1. Pain intensifies and diffuses	1. Pain may involve entire limb
2. Localized edema	2. Edema spreads	2. Irreversible trophic changes
3. Hyperesthesia	3. Hair becomes scant, nails become brittle	3. Contractions and subluxations may occur
4. Muscle spasm	4. Initial signs of osteoporosis	4. Severe and diffuse osteoporosis
5. Stiffness and limited mobility	5. Atrophy of the muscle begins	5. Severe atrophy of the muscles
6. Hyperhidrosis		
7. Vasospasms: at onset skin warm, red, and dry quickly changing to cyanotic, cold, and sweaty		

The signs and symptoms of RSD may often alert the practitioner to another disease process. Patients with nerve entrapment syndromes or other neurological

conditions have been incorrectly diagnosed with RSD (Reflex Sympathetic Dystrophy Association, 1996). The fact that there are no specific tests that will unequivocally confirm the diagnosis of RSD often leads to misdiagnosis (Schwartzmann, 1993). Hendler (1993) noted the best way to differentiate a patient with RSD and one suffering from other nerve syndromes involves testing the affected limb for sensitivity to temperature. The majority of RSD patients experience extreme sensitivity to heat or cold (Hendler, 1993).

Diagnostic Studies and Treatments.

Several researchers have examined the different diagnostic techniques and subsequent treatments available. For the purpose of this study, the work of Hendler (1993) will be used to describe the recommendations regarding available resources to assist in the diagnosis and treatment of RSD. Hendler (1993) reiterated the importance of early diagnosis and treatment to provide a cure for RSD. He stated that "any delay in treatment will result in a disorder that is markedly resistant to treatment and can become permanent" (Hendler, 1993, p. 12). Keeping in mind the goals of the study, a brief review of available resources will be provided. Accepted diagnostic procedures include thermography, bone scan, intravenous phentolamine injection, drop and swipe test, sympathetic block, epidural block, peripheral nerve block, three dimensional computed tomography (3D CT), and electromyogram (EMG) nerve conduction (Hendler, 1993).

Accepted treatment regimens include steroids and intense exercise for early stages. Hareau (1996) studied 120 women, aged 35 to 75 years, and 30 men, aged 30 to

60 years. These patients were diagnosed with RSD three months after the onset of symptoms. Prompt diagnoses and range-of-motion exercises resulted in an 85% success rate and cure. Sympathetic blocks serve as a diagnostic tool as well as treatment. According to Hendler (1993) a patient should require no more than 12 blocks. If the symptoms return after the medication from the blocks wears off, a sympathectomy may be necessary. The success rate of a sympathectomy, the removal of a part of the chain of sympathetic ganglia, ranges anywhere from 12% to 92%. This spread in results is directly related to misdiagnosis and abuse of the treatment mode, the skill of the surgeon, and the reliability of a patient's response to treatment. Other treatment options include epidural electrical stimulation, morphine pumps and other pain medications, or amputation in extreme cases (Hendler, 1993).

Attempt to Clarify the Disorder.

The most recent term used to define RSD is CRPS I and II. A special interest group of the International Association for the Study of Pain believes this term will aid in the diagnosis of RSD and avoid misdiagnosis. It is their belief that the terms "causalgia" and "reflex sympathetic dystrophy" independently describe this condition and, therefore, need to be differentiated (Colton & Fallat, 1996). The overall term, CRPS, requires the presence of regional pain and sensory changes following a destructive event. Other findings, such as abnormal skin color, temperature change, abnormal pseudomotor activity, or edema, are assessed and compared to the expected course of the injury. If the degree of the findings exceeds the expected findings, a diagnosis of CRPS should be

considered. CRPS type I (RSD) is said to be lacking the distinguishing characteristic of a nerve lesion. CRPS type II (causalgia) has the distinction of a definable nerve lesion. The term "sympathetically-maintained pain" (SMP) is also recognized as a separate component to this group of conditions (Stanton-Hicks et al., 1995). A text utilized by students and health care providers, (1998 Current Medical Diagnosis and Treatment), continues to recognize the term RSD and not CRPS.

Nursing Literature on Reflex Sympathetic Dystrophy

Nursing literature about RSD is seriously limited. Greipp (1990) conducted a research study and has published three articles relative to that study. Her research was a retrospective pain study in a pediatric sample. The researcher identified discrepancies between what appears in the literature and what is evidenced in clinical practice. The sample included 27 participants, ranging from the ages of 6-19 years. This sample was chosen from a random list of 165 clients registered with the RSD Association as having been diagnosed with RSD by physicians. Diagnoses were made on the basis of physical examination and clinical findings, including the clients' complaints of constant burning pain, hypalgesia, localized edema, vasospasm, and hyperhydrosis. The author suggested that RSD was not as rare in children and young adults as the literature reviews had revealed (Greipp, 1990). Greipp also recognized that by 1990 the disorder was not classified with an international classification of disease code (ICD). The author also endorsed documentation of all cases of RSD to provide a better perspective of this disease process (Greipp, 1990).

Subsequent to Greipp's work RSD was given an ICD code. There are actually four categories--each with a different ICD code--to demarcate the characteristics. The four categories include: (a) unspecified site, (b) other specified site, (c) upper extremity, and (d) lower extremity (Reflex Sympathetic Dystrophy Association, 1998).

Other Pertinent Nursing Literature

Identifying the role in which nursing should embrace this poorly understood disorder requires an understanding of certain aspects of the discipline. The role of the Advanced Practice Registered Nurse (APRN) is discussed along with the responsibility the discipline of nursing has to contribute to the further study of this confusing phenomena.

The APRN works independently as well as in collaboration with a variety of individuals to diagnose and manage clients' health care problems. The general scope of services provided by APRNs has three main categories: assessment of health status, diagnosis, and case management. The role is characterized by an emphasis on health promotion and disease prevention; in addition, it involves the diagnosis and management of common acute illnesses/injuries and stable chronic diseases. In the provision of these services, APRNs may order, conduct, and interpret appropriate diagnostic and laboratory tests and prescribe pharmacological agents, treatments, and nonpharmacologic therapies (Sherwood, Brown, Fay, & Wardell, 1997).

Controversies surrounding RSD have made it difficult to educate the health care community. This is compounded by the well-documented challenge for rural nurses to maintain proficiency in multiple areas of nursing (Bushy, 1991). The challenge of rural nurses to access professional development is compounded by geographical and professional isolation (Berry & Seavey, 1994).

McCarthy and Hegney (1998) conducted a literature review exploring issues related to evidence-based practice and rural nursing. The authors stated, "It is important that nurses' awareness and understanding of evidence-based practice be enhanced and that strategies for fostering the development of clinically relevant programs of nursing research be identified for rural health services" (McCarthy & Hegney, 1998, p. 97). Traditional needs assessment for continuing education reflect personal interests and perceptions of learning needs rather than an actual knowledge deficit (Maloney & Kane, 1995). The need for an increase in awareness and synthesis of nursing knowledge development is consistent with nursing's holistic focus (Copnell, 1998).

Theoretical Perspective

As a pioneer in the research of describing the level of awareness regarding RSD, certain assumptions were made to rationalize outcomes. Due to the complexity of RSD, a diverse selection of perspectives were used to understand the problem.

The research instrumental in the publication of From Novice to Expert by Patricia Benner provides assistance in explaining possible explanations for why some participants

in this study have a greater awareness of RSD than others. Patricia Benner explained that as nurses pass through levels of proficiency there is a “shift from reliance on analytical, rule-based thinking to intuition.” For example, the expert nurse learns to recognize subtle physiological changes more effortlessly than the novice nurse does (Benner, 1984). As stated by Benner (1984), “The skills acquired through nursing experience and the perceptual awareness expert nurses develop as decision makers . . . lead them to follow their hunches as they search for evidence to confirm the subtle changes they observe in patients” (p.165).

The skill of the nurse and professional “intuition” will lead to a questioning of unexplained symptoms. Intuition has been an essential component of nursing clinical judgment for over 20 years. It is characteristic of a nurse to acquire “gut” feelings about a patient. These feelings may simply be that the nurse believes there is a deviation from the norm. This form of awareness is recognized as relevant and has been termed as “intuitive knowing” (King & Appleton, 1997).

Woods (1998) suggested that when the discipline of nursing develops a “passion” for a particular phenomenon a number of events take place. . . . A desire to learn more about a particular population or disease process generates knowledge that is more sensitive to the individuals, families, and populations that are studied. This sensitive knowledge stems from the exploration of individual experiences and perceptions regarding the phenomena under study. Once an increase in knowledge is obtained, collaboration with

other disciplines--excluding geographic boundaries--is encouraged. The final event that occurs involves personal satisfaction towards the discipline of nursing for engaging in knowledge development (Woods, 1998).

Implementing interventions based on the knowledge gained is where nursing turns to Milio's framework for prevention. An upstream view encourages health-promoting choices and recommends that society be responsible to provide resources needed to promote healthy choices (Milio, 1976).

Summary

Reflex Sympathetic Dystrophy is a complex, multisymptom pain condition that was described during the early 1700s and is still poorly understood. The consequence of the obscurity of this disease is the presence of an underserved population; a population that feels isolated and misunderstood. Although controversy surrounds the pathophysiology, diagnosis, and treatment of RSD, researchers are in agreement that early recognition of the subtle, early symptoms is crucial for an appropriate treatment plan (Peck, 1998).

The underserved population in Montana is of great concern. In the study performed by the national RSD Association between 1993 and 1996, it was identified that Montana was 1 of 4 states without reported cases of RSD, and the only 4 states that do not have a local RSD association. The RSD associations in the 46 states collected the

data necessary for the study. One may argue that Montana does not have an association because there are no cases in the state; conversely, confirmation that there are persons with RSD in Montana was obtained from one clinic in one county of Montana. There are no documented statistics for persons with RSD in Montana although estimations could be cited following a review of national statistics.

Nursing research regarding this disorder is greatly lacking. However, nursing theory provides standards of care to facilitate appropriate actions for all conditions. APRNs have the ability if adequately trained to diagnose and treat RSD. Implementing preventive, holistic care for persons diagnosed with the condition is crucial. Becoming advocates for an underserved population will be possible with a better understanding of this complicating problem.

CHAPTER 3

METHODS

An exploratory, descriptive design utilizing the survey method was used in this study. This study was designed to elicit information regarding the level of awareness about a complex, poorly understood disorder and factors influencing that level of awareness. The need for education regarding the condition was also explored.

Research Methodology

The research was conducted using a questionnaire mailed to a target population. Survey research is the most common type of research, and the questionnaire was an easy-to-use and relatively inexpensive method for collecting data from a large sample. The questionnaire consisted of 27 fixed-choice questions developed by the researcher with a few questions requiring explanation of the choice selected. The self-administered questionnaire was descriptive in design and included demographic information. The estimated time for completion of the questionnaire was 10 minutes.

The majority of the questionnaires were sent to the participants' home addresses with a few sent to business addresses. It was important to assure a nonthreatening environment in which to complete the questionnaire considering the potential apprehension by the Advanced Practice Registered Nurses (APRN) related to answering questions about an unfamiliar subject.

Sample

At the time of the study, there were 317 APRNs certified in Montana; all were included in this cross-sectional study. The APRN includes the Nurse Practitioner, the Clinical Nurse Specialist, the Certified Nurse Midwife, and the Certified Nurse Anesthetist (American Academy of Nurse Practitioners Standards of Practice, 1993). It was important to include all APRNs to explore the diversity regarding their awareness of Reflex Sympathetic Dystrophy (RSD), and examine possible relationships between that level of awareness and different educational backgrounds. The names of potential participants were obtained from public records available through the Board of Nursing in Helena, Montana, as well as a purchased list from the most recent APRN convention.

Participation in the study was voluntary, and return of the completed questionnaire was considered consent to participate. The subject matter of the questionnaire was presented in a nonthreatening manner with the benefits of the study clearly identified. Identification numbers, located on the questionnaire, were used for statistical analyses. These numbers were stored separately from identifying information. No names or identifying information were used in the study.

Questionnaire

Development of the questionnaire followed an extensive search of the literature regarding the disease process. No research was located that examined health care providers' awareness or knowledge about this condition.

A cover letter was enclosed with the questionnaire. The letter included an explanation of the purpose and importance of the study, the manner in which data would be handled and analyzed, and the names and phone numbers of the researcher and chairperson to answer individual questions regarding the research (see Appendix A).

Section one of the questionnaire consisted of 14 questions to elicit information regarding the participants' awareness of RSD. In order to limit the apprehension related to the potential lack of awareness concerning the condition, two highly publicized disease processes were a component of the first six questions. The first three questions had response choices that ranged from poor to excellent. The next three questions were used to examine the estimated number of clients, assessed by the participants, with the diagnoses of each of the disease processes. The two disease processes used along with RSD were arthritis and multiple sclerosis (MS). Comparison of the awareness of the three diseases exposed important data regarding the general awareness of RSD as well as providing validity to the assumption that MS is more recognized than RSD.

The remaining eight questions of section one solely focused on RSD and continuing education. Seven of the eight questions sought a "yes" or "no" answer to specific inquiry about RSD awareness and past education exposure to the disorder. The other question requested the participant to rank, according to their preference, a variety of continuing education modes. Space for participants to describe and comment on their answers was provided for clarification.

Section two of the questionnaire consisted of 13 questions. The first 12 questions requested demographic and clinical practice information including: age, gender, highest level of education, advanced education in nursing, years of practice, area and setting of

practice, and specifics related to number of hours worked and clients seen per week. The final question gave participants the option of receiving the results of the study. (see Appendix B).

Human Subjects Approval

Prior to mailing the questionnaires, approval by the College of Nursing Human Subjects Committee was received. See Appendix C for the letter of approval dated October 23, 1998.

Data Collection and Response

Data Collection Part One

The questionnaire was mailed to 317 APRNs with a self-addressed, stamped envelope on November 2, 1998. Part one's overall response rate with usable data was N=210, (66.2%) (see Table 2).

There were 103 questionnaires returned during the first week following the initial mailing; 98 were usable. Eleven of the 15 unusable questionnaires were returned due to no forwarding address, and four others were returned with comments "retired" and "N/A to practice." A reminder postcard was sent to 227 participants on November 10, 1998 (see Appendix D). There were 78 questionnaires returned during the week following the mailing of the first postcard; eight were not usable. Three questionnaires were returned due to the inability to forward, two questionnaires were returned with a written message stating retired, and two questionnaires were returned blank. One completed questionnaire was not usable, as the participant no longer practiced in the state. On November 17, 1998, a reminder postcard was sent to 149 nonresponders (see Appendix E). Within two weeks 46 more questionnaires were returned; six were not usable. Three questionnaires

were from individuals who were retired, one questionnaire was returned blank, and two questionnaires were returned completed although the participants no longer practiced in Montana. A follow-up to nonresponders was mailed on December 1, 1998 (see Appendix F). Between the date of that mailing and January 4, 1999, 15 questionnaires were returned. A total of six out of the 15 were returned blank, leaving nine usable questionnaires.

Table 2. Questionnaire Response Rate from Data Collection Part One.

Mailing	# Returned N=317	% Total	# Usable	% Usable
Initial	103	32.5	88	27.8
1 week	79	24.9	71	22.4
Prompt 1	46	14.5	42	13.2
Prompt 2	15	4.7	9	2.8
Total	243	76.6	210	66.2

Data Collection Part Two

A final attempt was made after the holidays to encourage participation. The remaining 74 nonresponders were randomly separated into three groups. The first group of 24 participants was selected to receive a phone call from the researcher. Six out of the 24 were contacted by phone and all completed the questionnaire. The second group of 25 participants was selected to receive a final follow-up letter (see Appendix G). There were no responses from this group. The third group of 25 participants was selected to receive another questionnaire, including a self-addressed, stamped envelope. There were a total of nine completed questionnaires obtained from this group.

The cutoff date for inclusion of the study was January 15, 1999. The overall response rate, of data collection part one and part two, of usable data was N=225 (70.9%) (see Table 3).

Table 3. Questionnaire Response Rate from Data Collection Part One and Part Two.

	# Usable Responses N=317	% Usable
Part One	210	66.2
Part Two	15	4.7
Total	225	70.9

A thank-you letter was sent to all participants who had returned the completed questionnaire along with a packet of the most recent information regarding RSD. Additional references were supplied in the packet to aid the participants in obtaining information about the disorder (see Appendix H).

Data Management

Data were entered into a SPSS-PC by the researcher for analysis and management. Each questionnaire had a code number to be used for the management and analysis of data. Data were reported in aggregate form with no use of names, and all identifying information was kept separate from the data. The identification or code number located on the questionnaire was used to acknowledge the return of the questionnaire. The code numbers were also used when sending follow-up postcards, prompts to nonresponders, thank-you letters with the packet of information, and reports of the study if requested by the participant.

CHAPTER 4

RESULTS

The purpose of this study was to describe the level of awareness about Reflex Sympathetic Dystrophy (RSD) among Advanced Practice Registered Nurses (APRN) in Montana and to determine any factors that may influence the level of awareness.

Data were analyzed using the SPSS program. Descriptive statistics were used to explain the level of awareness about RSD among APRNs in Montana. Such statistics included median, mean, mode, frequency, percentage, and standard deviation. To identify factors related to the awareness of RSD, a new variable from ordinal data was created to produce nominal measures; this aided in the understanding of concepts. The crosstabs subprogram in SPSS was used to cross-classify the recoded variable by other variables. Chi-Square analysis was used to test variation in data different from chance variation. This test was used to identify possible relationships between variables.

A description of the sample population is in the first section of this chapter. The second section contains the findings related to the level of awareness. In the third section the development of a new variable is discussed, and specific variables related to the awareness expressed. And finally, in section four are the results associated with continuing education.

Sample Description

Demographic data included age, gender, and professional information. The variables included in the professional data were education, practice specialty and setting, and population served.

Demographic

The sample of 225 Advanced Practice Nurses in Montana included 197 women and 28 men. The age of the participants ranged from 30 to 75 with a mean of 51 years.

Professional

Education. According to the American Academy of Nurse Practitioners, the Advanced Practice Nurse may include the Nurse Practitioner, the Clinical Nurse Specialist, the Certified Nurse Midwife, and the Certified Nurse Anesthetist (American Academy of Nurse Practitioners Standards of Practice, 1993). Among those surveyed 70% were prepared as nurse practitioners, 12% certified clinical nurse specialists, 12% certified nurse anesthetists, and 6% certified nurse midwives.

The three most frequent responses regarding the highest level of education completed were master's in nursing (45%), bachelor's in nursing (21%), and diploma in nursing (14%) (see Table 4).

Table 4. Highest Level of Education Completed.

Level of Education	Frequency (N=225)	%
Master's in Nursing	102	45
Bachelor's in Nursing	48	21
Diploma in Nursing	32	14
Bachelor's in Other	17	8
Master's in Other	15	7
Associate in Nursing	6	3
Doctorate in Other	4	2
Doctorate in Nursing	1	.4

It was interesting to note the diversity among nurse practitioners regarding their highest level of education completed. There were 157 nurse practitioners: 80 with a master's degree in nursing, 37 with a bachelor's degree in nursing, 16 with a diploma in nursing, three with an associate degree in nursing, one with a doctorate in nursing, and the remaining with a bachelor's, master's, or doctorate degree in another field. The requirement that all nurse practitioners must be masters-prepared has only been in effect since January, 1995 (Montana State Board of Nursing, personal communication, February 2, 1999). For purposes of this study, no attempt was made to isolate advanced degree participants. Data were evaluated on the basis of addresses supplied by the state of Montana for persons listed as having APRN status.

State. The state in which participants received their advanced education was quite diverse, however the majority (N=46) received their advanced degree in Montana. Western states in general were the most frequent responses with the midwest and eastern states fairly evenly divided (see Figure 2).

Years of Practice. The years of practice, as registered nurses, prior to receiving an advanced degree ranged from less than one to 40 with a mean of 11. It was interesting to note that the participant with 40 years of experience as a registered nurse received a master's in nursing from Montana and has been practicing as a nurse practitioner for the past two years. The years of practice as an APRN ranged from less than one to 39 with a mean of 12. The participant who had been practicing for less than one year, was a new graduate who recently passed the certification exam.

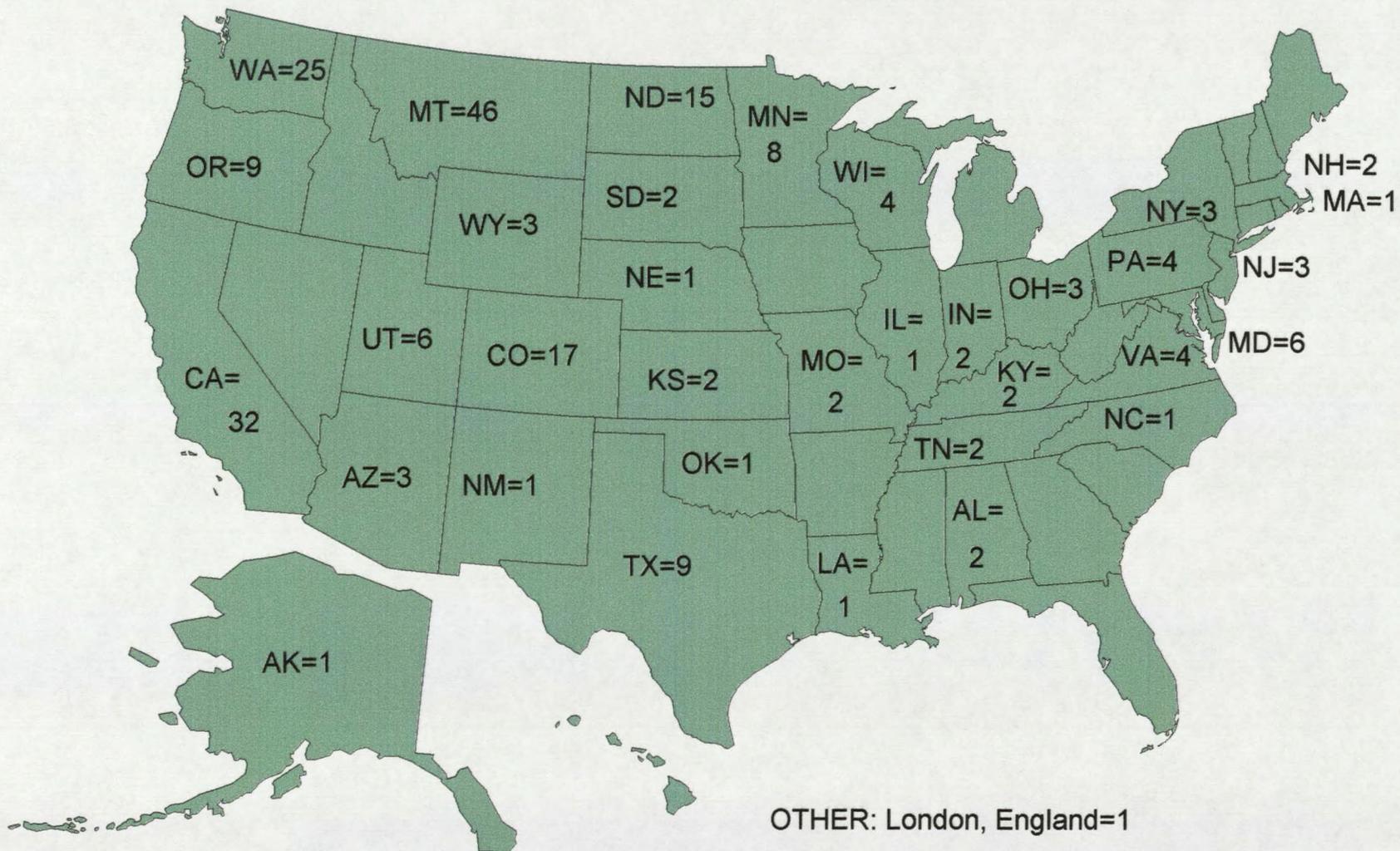


Figure 2. States in Which Advanced Degree Received.

Primary Practice. Family health was the primary area of practice for 31% of the participants, and the second most frequent area of practice was women's health at 25%; The third most frequent (12%) area of practice was surgery with all of those responders identifying themselves as certified nurse anesthetists (see Table 5).

Table 5. Primary Area of Practice.

Practice	Frequency (N)	%
Family Health	68	30.5
Women's Health	55	24.7
Surgery	26	11.7
Adult	17	7.6
Pediatric	13	5.8
Psych/Mental Health	10	4.5
Student Health	8	3.6
Geriatric	7	3.1
ER/Urgent Care	6	2.7
Occupational Health	5	2.2
Endocrinology	3	.13
Cardiology	2	.8
Oncology	1	.4
Community Health	1	.4
Rehabilitation	1	.4

Setting. The most frequent settings that participants worked in were physician offices, ambulatory clinics, and the hospital. All but one of the participants whom selected the hospital as their primary practice setting were certified nurse anesthetists. Twenty-three participants did not respond to this question. The reasons for not

responding, as analyzed by hand written comments, included retirement, unemployment, and bewilderment as to selecting only one setting. Participants who returned a completed questionnaire and indicated retirement were utilized in this research to establish any relationship between years of practice and level of awareness about RSD (see Table 6).

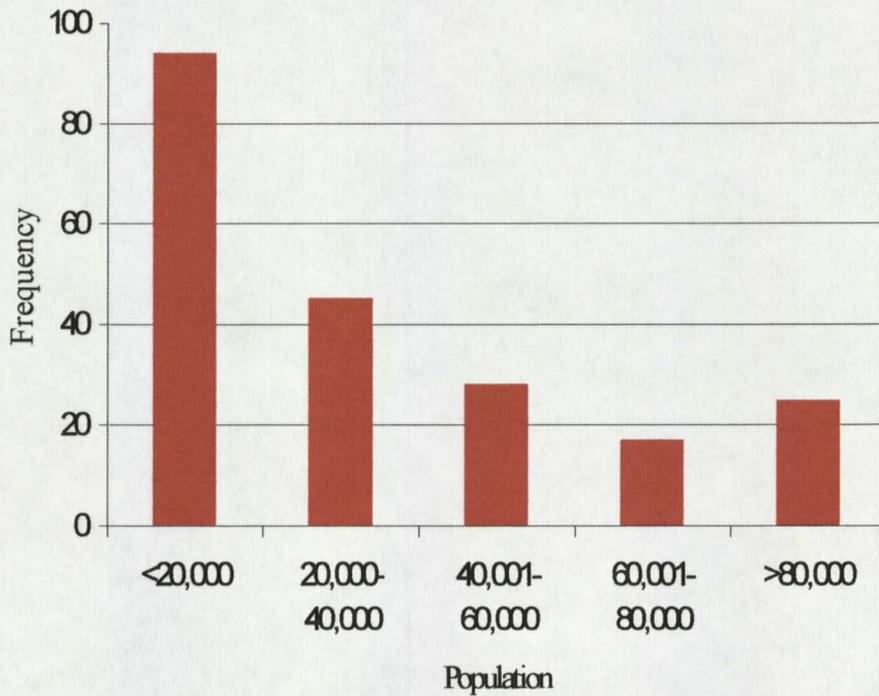
Table 6. Practice Setting.

Practice Setting	Frequency (N)	%
Physician Office	50	24.8
Ambulatory Clinic	40	19.8
Hospital	31	15.3
Independent Nurse Practitioner Office	24	11.9
School/University	17	8.4
Public Health	11	5.4
VA/Military	8	4.0
Family Planning Clinic	8	4.0
ER/Urgent Care	4	2.0
Extended Care/Nursing Home	3	1.5
Occupation Clinic	3	1.5
Correctional Facility	1	.5
Secure Care Facility	1	.5

Size of Communities. The population of the communities in which the APRN's practiced varied from 450 to 120,000. There were 25 responders who indicated that the approximate population of the town in which they practiced was greater than 80,000. It is speculated that these responders included the surrounding areas in this estimation, based on Montana population statistics. In 1995 the three largest counties in Montana were identified as Yellowstone county at 124,655, Missoula county at 87,130, and

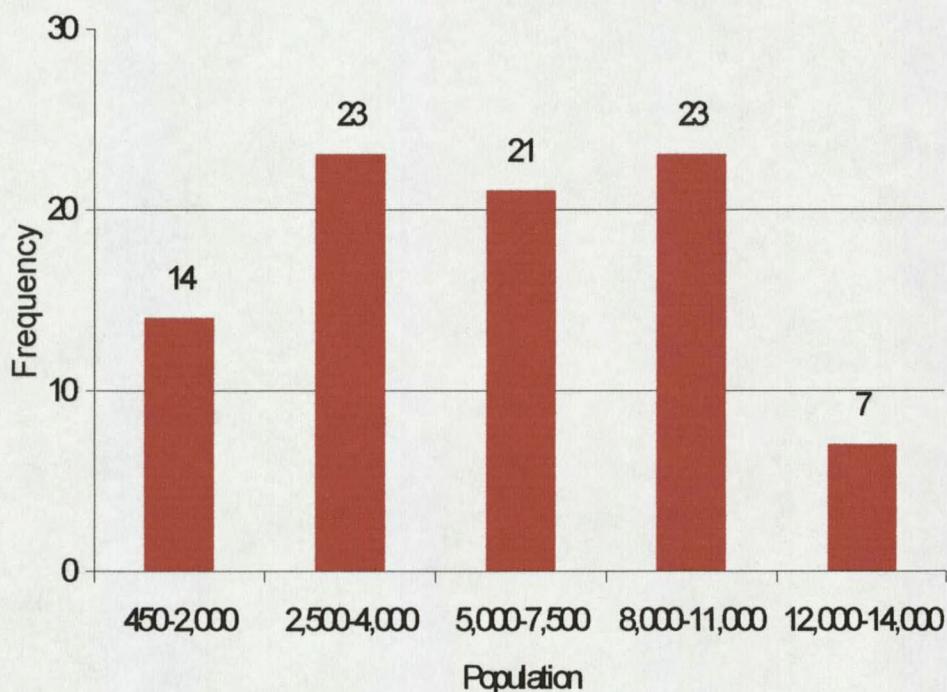
Cascade county at 81,091 (Institute for Tourism and Recreation Research, 1996). There were 16 who chose not to respond to the question regarding the population of the community in which their practice was established. After review of hand written comments by those who chose not to respond to this question, the majority were not currently practicing and therefore elected to not answer the question (see Figure 3).

Figure 3. Population of Town Where Practice is Located.



It was interesting to note that the majority practiced in areas less than 20,000. A breakdown of those who selected a community size less than 20,000 was done to better illustrate the number of APRN's practicing in the rural areas (see Figure 4).

Figure 4. Breakdown of Communities less than 20,000



Hours Worked per Week. The hours worked, as an APRN, per week ranged from 2 to 96 with a mean of 34.2. There were 20 who chose not to answer this question.

In addition, 22 participants reported zero hours worked per week. It is postulated that these APRN's may have retired, were unemployed, or were unclear about how to answer the question.

Clients Seen Per Week. The average number of clients seen per week was 43 ($SD=34$), with a range of 1 to 150. There were 29 who did not answer this question, and an additional 21 who entered zero for clients seen per week. It is speculated that the explanation for this result is similar to those found for hours worked per week.

Level of Awareness

Awareness of Reflex Sympathetic Dystrophy.

The primary focus of this research was to describe the awareness among Advanced Practice Nurses in Montana regarding the condition reflex sympathetic dystrophy. The question which determined the level of awareness was: Rate your level of familiarity with the disease process of reflex sympathetic dystrophy. The question had response choices that ranged from "poor" to "excellent." A majority $N=174$ (77.3%) of participants described their familiarity of this condition as poor. Eighteen percent described their familiarity as fair, four percent as good, and less than one percent as excellent (see Table 5).

Table 7. Awareness of Reflex Sympathetic Dystrophy

Familiarity	Frequency N=225	Percent
Poor	174	77.3
Fair	41	18.2
Good	8	3.6
Excellent	2	.9

Several participants offered their personal opinions, regarding the lack of awareness about this condition, in hand written comments. A selection of quotes were selected to illustrate some of their thoughts.

“Good idea for a study. Your topic is not well known and I’m sure it’s not well understood!”

“I have found few providers who actually understand or correctly treat RSD. Interesting subject.”

“Somewhere in my career I have heard of RSD but have no idea where or even when. I appreciate the opportunity to learn about this condition.”

“I am looking forward to the information on this topic. I have seen one patient with very late stages of this problem and I want to be able to intervene at earliest possible point.”

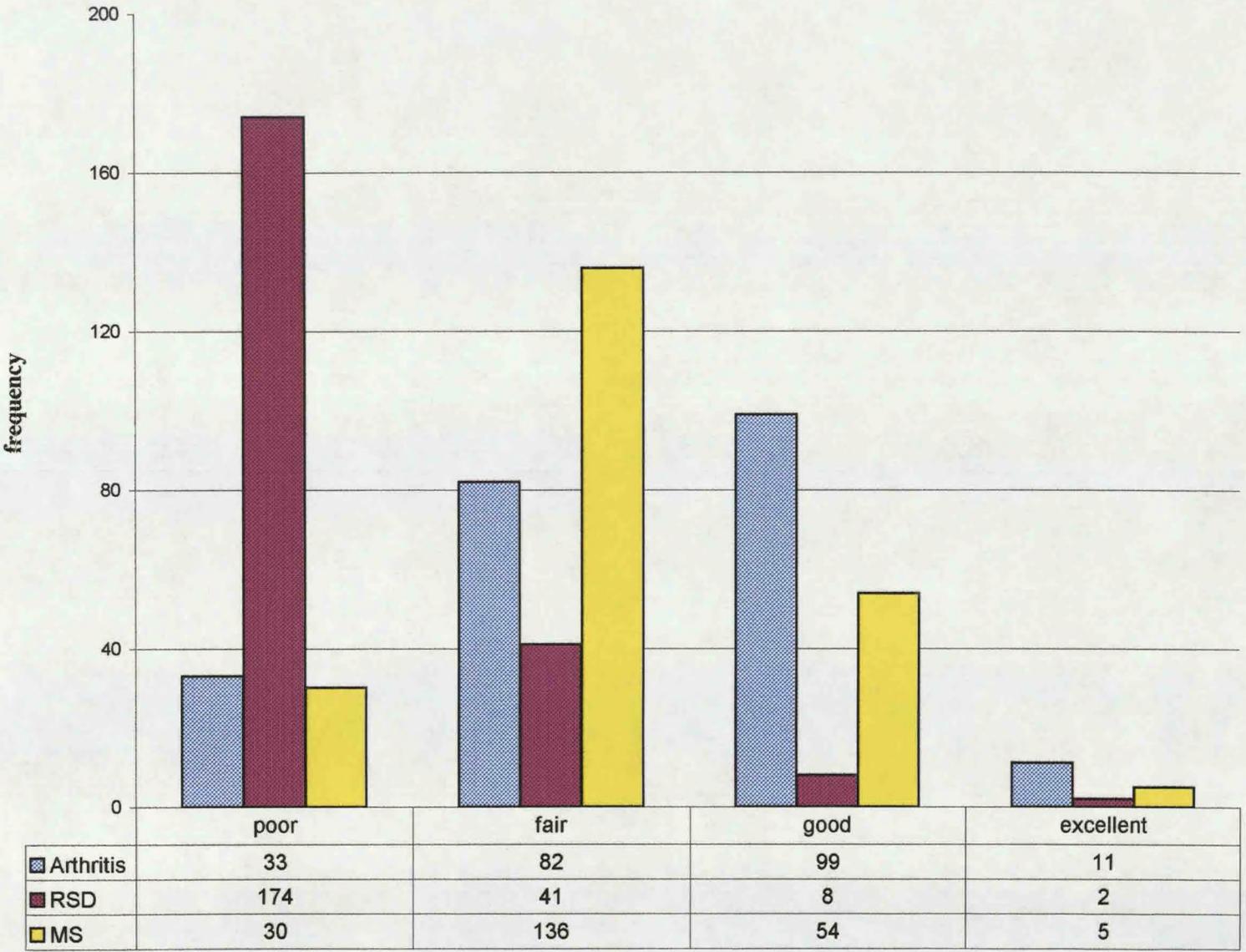
“A very interesting and I think very under studied phenomena.”

Awareness of Other Disease Processes.

Examining the level of awareness regarding arthritis and MS assisted in the analysis of the level of awareness about RSD. Arthritis has the largest national

prevalence compared to MS and RSD, and yet only 44% (N=99) reported to have a “good” level of awareness of that disease process. MS has a much lower national prevalence compared to RSD, although the majority (60%) rated their level of awareness of MS as “fair”; and 77% admitted to a “poor” level of awareness about RSD. Although awareness of arthritis and MS were greater than RSD, the low percentages of responders having a “good” or “excellent” awareness of arthritis and MS were of concern. Both of these disease processes are common chronic conditions managed by APRN’s and a higher level of awareness was expected. Research must consider reasons for this unexpected result. Perhaps the term “awareness” was confusing to the responders. Requisition of a basic awareness of arthritis and MS may have been perceived as an inquiry to in-depth knowledge about the disease processes. Another possibility that must be addressed is a potential measurement issue. The questions that included arthritis and MS may have been limiting, as a four choice selection from “poor” to “excellent” was used. This may account for missing data and/or an inaccurate portrayal of the responders’ awareness of these disease processes (see Figure 5).

Figure 5. Level of Awareness Comparison Between Disease Processes.



Number of Clients Assessed.

Responders were asked to identify the approximate number of clients assessed by them in the past 12 months with the diagnosis of arthritis, MS, and RSD. The number of clients identified with arthritis ranged from zero to 550 with a mean of 30; the number of clients identified with MS ranged from zero to 10; and the number of clients identified with RSD also ranged from zero to 10. It is important to point out that although MS and RSD are being observed at similar rates, participants had a greater awareness of MS.

There were seven responders that claimed to have assessed three or more clients diagnosed with RSD in a 12 month period. Five of these identified their title as certified nurse anesthetists. The remaining two included a nurse practitioner with expertise in rehabilitation, and a certified nurse specialist with expertise in oncology.

Historical Threat to Internal Validity.

Two months prior to the mailing of the questionnaires, an article about RSD appeared in the September 1998 issue of Advance for Nurse Practitioners. Participants were questioned if they had read the article to explore any possible effect this may have on data analysis. The majority (N=182, 87%) did not read the article, 28 did read the article, and 15 did not answer the question.

Variables Related to Level of Awareness

From the ordinal data obtained from the question that rated the level of awareness of RSD as "poor", "fair", "good", or "excellent", the majority (77%) of responses were

“poor”. Therefore, dichotomous categories were constructed placing the 174 participants with a “poor” awareness of RSD into one category and those with a “fair”, “good” or “excellent” (N=51) into the other.

Cross-tabulations were performed to illustrate cross-classifications of the new variable and other variables relevant to the level of awareness. In the next section, specific relations between variables were explored.

The assumption that education is significant to ones awareness regarding a disorder is reasonable. The participants advanced education and a variety of additional modes of education specific to RSD were examined.

Advanced Education

A cross-tabulation was done to illustrate the relationship between the level of awareness, and the different advanced titles to include: nurse practitioner, clinical nurse specialist, certified nurse midwife, and certified nurse anesthetist. The nurse anesthetists had the highest level of awareness (44% selected fair to excellent), nurse practitioners at 23%, certified nurse specialists at 0.1%, and no certified nurse midwives claimed to have a fair to excellent awareness of RSD. One possible reason for the awareness among nurse anesthetists may be related to the fact that sympathetic blocks, often performed by nurse anesthetists, are a common diagnostic tool and treatment for RSD. Conversely, in the words of one of the participants who is a nurse midwife: “Certified nurse midwives do not generally diagnose and treat disorders unrelated to pregnancy and well women’s health” (see Table 6).

Table 8. Advanced Nursing Education and Awareness of Reflex Sympathetic Dystrophy.

	Awareness	
	Poor	Fair - Excellent
Nurse Practitioner (N=157)	121 (77%)	36 (23%)
Certified Clinical Nurse Specialist (N=28)	25 (89%)	3 (0.1%)
Certified Nurse Midwife (N=13)	13 (100%)	0 (0%)
Certified Nurse Anesthetist (N=27)	15 (56%)	12 (44%)

Participants were asked if they were exposed to content on RSD in their advance practice education course content. The majority (91%) responded “no.” The 20 (9%) who responded “yes” consisted of 12 nurse practitioners, seven certified nurse anesthetists, and 1 certified nurse specialist. One responder addressed the educational component by stating “My familiarity with RSD comes from self-study inspired by my primary care management with a patient diagnosed with RSD prior to the patient’s enrollment in my practice.”

Education Specific to Reflex Sympathetic Dystrophy.

There were only two participants who had attended a continuation course specific to RSD; they included one nurse practitioner and one nurse anesthetist. There were 25 participants who had attended a continuation education course that included RSD; they included 13 nurse practitioners and 12 nurse anesthetists. Three out of the 25 who attended a course that included RSD still reported having a “poor” level of awareness regarding the disorder (see Table 7).

Table 9. Continuation Education Course and Awareness of Reflex Sympathetic Dystrophy.

	Awareness	
	Poor	Fair – Excellent
Attended Education Course that Included RSD (N=25)	3	22
Did Not Attend Education Course That Included RSD (N=200)	171	29

Media Education.

Participants were asked if they recalled any media coverage about RSD during the past two to three years. The majority (94%) responded “no.” The 13 that responded “yes” identified the coverage from newspaper, TV program, or nursing journal.

Personal Experience.

Respondents were questioned if they had any personal experience with family members or friends diagnosed with RSD, and if so, was that their initial exposure to the disorder. There were nine who had personal experience with friends, family, or acquaintances diagnosed with the syndrome. Six of the nine identified the researcher as the person who first made them aware of RSD. All but one responder identified their personal experience as their initial orientation to the disorder.

Awareness of Reflex Sympathetic Dystrophy by Gender.

Eighty-eight percent (N=197) of the responders were women and 12% (N=28) were men. After completing cross-tabulations of gender and level of awareness about RSD, it appeared that more men had a “fair” to “excellent” awareness of RSD than the

women. Result of the Chi-Square analysis indicated that there was a significant association (χ^2 ; $p=.001$) between RSD awareness and gender (see Table 8). Eight out of the 13 men who reported having a “fair” to “excellent” level of awareness about RSD were certified nurse anesthetists. This finding corresponds with the previous finding that nurse anesthetists appear to have the greatest level of awareness of this disorder.

Table 10. Gender and Awareness of Reflex Sympathetic Dystrophy.

	Awareness	
	Poor	Fair – Excellent
Women (N=197)	159 (80.7%)	38 (19.3%)
Men (N=28)	15 (53.6%)	13 (46.4%)
Total	174	51

Other Variables.

Chi-Square analysis was used to identify relationships between the level of awareness reported and demographic variables. There were no significant relationships between level of awareness and demographic variables such as: age, setting, years of practice, or population served. It is postulated that the small sample size of those who claimed to have a “fair” to “excellent” awareness of RSD (N=51, 22.7%) is insufficient to determine relationships between these variables and level of awareness demonstrated.

Continuing Education

It was postulated the results of this study would indicate a need for continuing education about RSD. Keeping this anticipated need in mind, responders were asked to

rank, according to their preference, a variety of continuing education modes. This information would aid in the development of continuing education courses specific to RSD in the future. The different modes included: face-to-face seminar, independent book course, independent video course, independent audio course, audio conference, video conference, Internet, and journals. The majority (92.3%) selected the face-to-face seminar as their primary preference for obtaining continuing education.

Videoconferencing and an independent book course were favored most frequently as alternative choices.

Summary

The purpose of this study was to describe the level of awareness about Reflex Sympathetic Dystrophy among Advanced Practice Registered Nurse's in Montana. A 70.9 % usable response rate was achieved. Results indicated an overwhelming lack of awareness, with 77.3 % of responders reporting to have a "poor" awareness of the disorder. Associated factors in this analysis were field of expertise, previous education on Reflex Sympathetic Dystrophy, and gender.

CHAPTER 5

DISCUSSION & SUMMATION

Reflex Sympathetic Dystrophy (RSD) is a condition that features a group of typical symptoms including: burning pain, tenderness, and swelling of an extremity associated with varying degrees of sweating, warmth and/or coolness, flushing, discoloration, and shiny skin. The exact mechanism of how RSD develops is poorly understood. There is no recognized criteria for diagnosing or treating the condition. Successful treatment is dependent upon a prompt diagnosis within the first three to six months following the onset of the initial subtle symptoms. Delay of a prompt diagnosis may lead to an irreversible, debilitating condition. Without a distinct confirmatory test available with which to diagnose this complex syndrome, the process of elimination occurs, wasting both time and resources, while delaying the identification of an accurate diagnosis.

Misconceptions about RSD are well documented in the literature. Many practitioners described RSD as a "new syndrome" or a "rare condition". The fact is, RSD was described in the literature over a century ago but remains poorly understood and, clinically is frequently unrecognized. The estimated national prevalence of six million persons diagnosed with RSD refutes the notion that it is a "rare condition". It is also important to note that this prevalence figure does not encompass the potential persons exhibiting symptoms of RSD without an accurate diagnosis.

Empirical information regarding the incidence of RSD in Montana was lacking at the time of the inception of this study. In attempts to discover acknowledgement that there may be persons in Montana diagnosed with the condition, one pain clinic in the Gallatin county was questioned about their patients. An estimated 25 persons per year are seen in this clinic for treatment of RSD. This single report prompted concern and a desire to find a possible reason for the lack of empirical information about RSD in Montana. One potential reason for the lack of documentation of caring for persons who may have RSD in Montana was related to a possible lack of awareness about the disorder among health care providers.

Most research in the study of Reflex Sympathetic Dystrophy (RSD) has focused on medical research, exploring specific diagnostic issues and treatments. The perceived lack of knowledge about the disorder suggested in the literature was the focus of this research. The inspiration for this study was to bridge the gap between documentation of existing research about the disorder and the lack of awareness at the clinical level. Without a basic awareness of a condition, the published medical research focused on diagnostic issues and treatments is ineffective.

Summary of Study

The purpose of this study was to explore the level of awareness about Reflex Sympathetic Dystrophy (RSD) displayed by Advanced Practice Registered Nurses

(APRN) in Montana. The two research objectives were to: a) describe the level of awareness about RSD among APRN's in Montana, and b) identify key factors (e.g. education, years of practice, etc.) that are related to the awareness of RSD.

An exploratory, descriptive design utilizing the survey method was used for this research. The sample of 317 APRN's in Montana included all of the state licensed or certified Nurse Practitioners, Certified Clinical Nurse Specialists, Certified Nurse Midwives, and Certified Nurse Anesthetists. The overall response rate was (N=225, 71%).

The data collected in this questionnaire provided the first systematic validation that there is a lack of awareness about RSD among a group of health care providers. The large number (N=174, 77.3%) reporting a lack of awareness about RSD renders assurance that the sample was representative of Montana's APRN's familiarity with the disorder. The associated factors in this study were: the APRN's field of expertise, previous education on RSD, and gender. Additional significant findings were gained from exploring demographic data.

Demographic Profile

The 197 women and 28 men ranged in age from 30 to 75 with a mean of 51 years. Forty-five percent (N=102) had a master's in nursing. Out of the 157 nurse practitioners, more than 45 percent (N=106) were not master's prepared. This finding validates the

need for the current actions of state and federal nursing organizations to standardize advance education. As of 1995, national provisions require that all APRN's be master's prepared.

It was interesting to note while examining the population of the communities in which the APRN's practiced, the majority practiced in rural areas with less than 20,000 people. Further investigation revealed that more than half of the APRN's practicing in communities less than 20,000 in size, identified their communities as having 2,500-4,000 or 8,000-11,000 people. Identification of the large number of APRN's practicing in communities less than 20,000 in size is encouraging. One major goal of the APRN has been to provide quality care to rural communities where access to care may be difficult.

Awareness of Reflex Sympathetic Dystrophy and Other Disease Processes

Seventy-seven percent of responders had a "poor" awareness about RSD. This finding took on additional significance when comparing the level of awareness between RSD, arthritis, and MS. Participants reported a considerably higher level of awareness of the other two disease processes; despite the higher national prevalence of RSD when compared to MS. Awareness of arthritis and MS was greater than for RSD. However, their general awareness of chronic illness promotes question about clinical practice. Arthritis has the largest national prevalence compared to the other disorders, and yet only 44 percent claimed to have a "good" awareness of the disease process. This finding was extremely distressing due to the well documented fact that chronic pain, to

include arthritis, is the most costly health problem in America. Estimated annual costs, including direct medical expenses, lost income, lost productivity, and compensation payments are close to \$50 billion dollars. In addition, Montana is one of the states with a high incidence of MS. Both arthritis and MS are common chronic conditions managed by APRN's and the incidence of these disease processes will continue to increase due to, in part, the increasing population of older adults. Review books used to study for the nurse practitioner certification exam, include a complete chapter on arthritis and a partial chapter dedicated to the management of MS. A higher level of awareness regarding these two conditions was expected and potential reasons for the results must be explored.

The research questions about RSD, arthritis, and MS were intended to elicit information regarding the responders' "awareness" of the disorders and not their "knowledge" about the disorders. Speculation of ambiguity regarding the questions may account for potential missing data and/or inaccurate portrayal of the awareness about arthritis and MS demonstrated by the APRN's. Further investigation is necessary to explore the language used in the question.

Field of Expertise and Gender

The certified nurse anesthetists had the highest level of awareness regarding the disorder. This finding is most likely related to the fact that sympathetic blocks, often performed by certified nurse anesthetists, are a common diagnostic tool and treatment for

RSD. The men in the study appeared to have a greater awareness about the condition. This finding was also related to the responders' area of expertise. The majority of men identified themselves as certified nurse anesthetists. The group of APRN's that displayed the lowest level of awareness about RSD were the certified nurse midwives.

Previous Education on Reflex Sympathetic Dystrophy

Previous education about RSD also had a significant impact on the level of awareness displayed. Eighty-eight percent of participant's who attended a continuation education course that included RSD, reported having a "fair" to "excellent" awareness of the condition. This finding validates the impact continuing education can have on understanding a phenomena. It is disconcerting that 91 percent (N=205) of the responders acknowledged no exposure to the disorder in their advance practice education course content. Including education regarding RSD in the advance education curriculum is essential to improve the level of awareness about the disorder.

Media coverage about RSD was explored. There were only 13 responders who recalled media attention (e.g. newspaper, television, journal) about the condition. Approximately 50 percent of the 13 reported having a "poor" awareness of RSD, while the other 50 percent claimed to have a "fair" to "excellent" awareness. Information regarding specific awareness or knowledge gained from the media attention was not offered. An increase in media coverage is required to further investigate its' effect on

awareness as well as educate the general public about RSD. The state in which APRN's received their advanced education, years of practice, primary practice or setting, or hours worked per week did not have an impact on the level of awareness displayed.

Conclusions

The finding that 77.3 percent (N=174) of the responders admitted to having a "poor" awareness about RSD provided the first empirical evidence that a lack of awareness about the condition exists among a group of APRN's. The foundation has been made to form a hypothesis for future study of RSD. It is hypothesized that a lack of awareness about RSD exists not only among other APRN groups, but also other disciplines within the health care system.

Nursing Implications

The initial symptoms of RSD may be subtle, often following a minor trauma such as a sprain. It is conceivable that an APRN may be the first to assess a client exhibiting symptoms of the disorder. It is essential that the APRN recognize early signs of this syndrome to assure a precise diagnosis, treatment, and/or referral to prevent an irreversible disability. The findings in this study indicate a need for education regarding the disorder and inclusion of RSD in the differential diagnosis while assessing clients. Based on the findings regarding the awareness of arthritis and MS, there appears to be a need to improve the preparedness of APRN's to manage chronic illnesses in general.

The impact of this study on persons diagnosed, or yet to be accurately diagnosed with RSD must be considered. It is conceivable that persons in Montana have RSD and have not been accurately diagnosed or treated. If this is true, there is an underserved population in Montana with a condition that is poorly recognized and understood. . Because of the importance of an early diagnosis and the recognition of possible devastating, and debilitating outcomes of RSD, a plan of action to increase the level of awareness about RSD is crucial to provide quality care to this underserved population. It is known that there are 25 persons receiving treatment for RSD at one clinic in one county in Montana, and yet there is no empirical information regarding the incidence of the disorder. Practitioners must begin to report cases of RSD to the state health department.

The discipline of nursing has the ability to lead a strategic plan designed to increase the quality of care to persons diagnosed with RSD. The initial step of this plan is to educate nurses, the general public, and other health care disciplines about RSD.

The recommendations for educational programs are directed to the participants of this study, to all APRN's in Montana, and to all future APRN's in Montana. Education to the general public and other health care disciplines may be achieved by the development of an RSD association in Montana. Completed and future educational programs include:

1. The distribution of educational materials to all participants of the study was completed.
2. A continuing education program at future state and national APRN conferences presented by a specialist in the area of RSD.
3. A report of the study and educational materials will be sent to nurse educators in the state of Montana with a request to include RSD in future course content.
4. A variety of educational methods will be explored to educate all health care providers and the public about RSD to include: (a) the development of a web page designed to assist persons in Montana diagnosed with RSD, and provide education to providers as well as the public, (b) publication of this study in nursing journals, (c) development of a pamphlet to distribute to providers and the public, and (d) use of the media (e.g. television).
5. Support the development of an RSD association in Montana which will assist in educating the health care community and the general public about the condition.

Recommendations for Future Research

Identification of significant relationships between variables was difficult because of the towering sample majority having a “poor” awareness of RSD. Additional research is endorsed to evaluate the level of awareness among other APRN groups, to further validate the findings of this study, and identify associated factors.

The questionnaire used in this study requires modification prior to future use. A number of demographic questions were too confining in regards to current practice. It would be helpful to include a closed-ended question regarding current practice (e.g. Are you currently practicing as an APRN? If no, please explain). Another problem with the questionnaire involved the comprehension of the term "awareness". It is speculated that this term may have been confusing, especially in regards to the awareness of arthritis and MS. An explanation of the term included in the questionnaire instructions may have clarified those questions. Utilizing a scale (e.g. 1-10) to describe awareness of the disorders would promote a more decisive description of the degree of awareness.

The next level of research needs to be explored, which may include examination of actual knowledge about the disorder and identification of potential misconceptions. Other health care providers are encouraged to initiate research addressing the probable lack of awareness and/or knowledge about RSD that exists in their discipline. Collaboration with other disciplines is essential, so that efforts may be implemented to address the special needs of persons diagnosed with RSD.

The lack of empirical information regarding the incidence of RSD in Montana must be addressed. It is crucial that an association representing the state of Montana consider initiating research focused on the attainment of empirical data to reflect the incidence of RSD in Montana. Once a population has scientifically been identified, further research exploring the experiences and special needs of persons diagnosed with RSD is advised.

Dissemination of relevant information obtained from this study will be accomplished by: (a) presenting the findings of this research to the APRN's at the state and national level at future conferences, (b) publishing articles in nursing journals, (c) sending a copy of the results of this study to the National Institute of Nursing Research, and to the National RSD Association, (d) providing a copy of the results of this study to the College of Nursing, and (e) providing the opportunity for the lay public to have access to the results of this study.

The above recommendations are simply the first steps that may be made to initiate further research and fulfillment of educational needs. This study has facilitated a basic awareness about RSD, and has demonstrated the need for practitioners to learn about the disorder.

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APPENDICES

APPENDIX A

COVER LETTER FOR QUESTIONNAIRE



Dear Colleague,

October 15, 1998

Reflex Sympathetic Dystrophy (RSD) is a chronic disease that affects the nerves, muscles, skin, bones, and the internal organs of the body in late stages. The syndrome has identifiable signs and symptoms and can become disabling, however is treatable if recognized early.

My name is Judy Nicoll, and I am a Family Nurse Practitioner student at Montana State University College of Nursing in Bozeman. As a part of my master's degree, I am conducting a research study to determine the awareness of reflex sympathetic dystrophy among APRN's in the state of Montana. While there has been ongoing research on the disease process RSD, it is a syndrome that has only recently caught the attention of healthcare providers. As a future APRN and one who has personal experience with the disease process, it is my goal to heighten the awareness of RSD among healthcare providers and the public.

The questionnaire will take approximately 10 minutes to complete. Your participation in this study is voluntary and the return of a completed questionnaire is considered your consent to participate. You are assured of complete confidentiality. The identification number located on the questionnaire will be used to check it off the mailing list when it is returned. Data will be reported in aggregate form with no use of names, and all identifying information will be stored separately from the data and locked at MSU College of Nursing in Bozeman. The questionnaires and data stored on a computer disc will be handled in a secure fashion solely by the researcher. It is important that you do not identify yourself on the questionnaire but feel free to write comments on the questionnaire. All data are confidential and will remain in their secured locations for 5 years, in which time they will be destroyed. A prompt response within the next week would be greatly appreciated. I recognize the value of your participation and the importance of your contribution to the success of the study. I acknowledge the expenditure of your valuable time as well as potential apprehension answering questions regarding a disease process that may be unfamiliar. The benefit of your participation includes the satisfaction of assisting in an area with little research and the acquisition of information regarding a disease process.

If you have any questions or concerns relating to the study, please call me at home at 406-282-7255 or you may contact my chairperson, Dr. Clarann Weinert at MSU Bozeman at 406-994-6036.

A packet with the latest information regarding RSD will be sent to you upon receiving your completed questionnaire. I hope you find this information useful in your practice. I thank you for your time and energy involved in this request and express my deep appreciation.

Sincerely,

Judy Nicoll

Judy Nicoll, BSN, RN
12720 Camp Creek Rd.
Manhattan, MT. 59741

APPENDIX B
QUESTIONNAIRE

**REFLEX SYMPATHETIC DYSTROPHY (RSD) AWARENESS
QUESTIONNAIRE**

Please try to answer each question by circling the response most appropriate to you or by providing short answers when requested.

Q-1. Rate your familiarity with the disease process of arthritis.

- A POOR
- B FAIR
- C GOOD
- D EXCELLENT

Q-2. Rate your familiarity with the disease process of reflex sympathetic dystrophy.

- A POOR
- B FAIR
- C GOOD
- D EXCELLENT

Q-3. Rate your familiarity with the disease process of multiple sclerosis.

- A POOR
- B FAIR
- C GOOD
- D EXCELLENT

Q-4. In the past 12 months, approximately how many clients with arthritis have you assessed?

_____ NUMBER ASSESSED

Q-5. In the past 12 months, approximately how many clients with reflex sympathetic dystrophy have you assessed?

_____ NUMBER ASSESSED

Q-6. In the past 12 months, approximately how many clients with multiple sclerosis have you assessed?

_____ NUMBER ASSESSED

Q-7. Have you ever attended a continuation education course specific to reflex sympathetic dystrophy?

- 1 YES
2 NO

Q-8. Have you ever attended a continuation education course that included the disease process reflex sympathetic dystrophy?

- 1 YES
2 NO

Q-9. Choose three modes of providing continuing education and rank them according to your preference, e.g. first choice is given a #1, second choice is given a #2, and third choice is given a #3.

- | | |
|-------|--------------------------|
| _____ | FACE - TO - FACE SEMINAR |
| _____ | INDEPENDENT BOOK COURSE |
| _____ | INDEPENDENT VIDEO COURSE |
| _____ | AUDIOCONFERENCING |
| _____ | VIDEOCONFERENCING |
| _____ | WORLD WIDE WEB |

Q-10. In your advance practice education, were you exposed to reflex sympathetic dystrophy in your course content?

- 1 YES
2 NO

Q-11. In the past 2 - 3 years do you recall any media coverage about reflex sympathetic dystrophy, e.g. radio, television, newspaper.

- 1 YES
2 NO

Q-12. Do you have family members or friends who have been diagnosed with reflex sympathetic dystrophy?

- 1 YES
2 NO

If yes, please describe: _____

If you answered NO to Q-12, please skip to Q-14.

Q-13. Was the experience of your family member / friend your initial exposure to reflex sympathetic dystrophy?

- 1 YES
- 2 NO

Now I would like to ask you for some demographic and clinical practice information.

Q-14. In what year were you born? 19_____.

Q-15. Your gender:

- 1 WOMAN
- 2 MAN

Q-16. What is your highest level of education completed?

- 1 DIPLOMA IN NURSING
- 2 ASSOCIATE DEGREE IN NURSING
- 3 BACHELOR DEGREE IN NURSING
- 4 BACHELOR DEGREE -- OTHER
- 5 MASTERS DEGREE IN NURSING
- 6 MASTERS DEGREE -- OTHER
- 7 DOCTORATE DEGREE IN NURSING
- 8 DOCTORATE DEGREE -- OTHER

Q-17. Select the appropriate title which describes your advanced education in nursing.

- 1 NURSE PRACTITIONER
- 2 CLINICAL NURSE SPECIALIST
- 3 CERTIFIED NURSE MIDWIFE
- 4 CERTIFIED NURSE ANESTHETIST
- 5 OTHER: _____

Q-18. . In what state did you receive your advanced practice education?

Q-19. How many years have you been practicing as an advanced practice nurse?

_____ YEARS

Q-20. How many years had you been practicing as a registered nurse before becoming an advanced practice nurse?

_____ YEARS

Q-21. What is your primary area of practice? (CIRCLE ONLY ONE)

- 1 FAMILY HEALTH
- 2 WOMEN'S HEALTH / OB / GYN
- 3 ADULT
- 4 GERIATRIC
- 5 PEDIATRIC
- 6 PSYCH / MENTAL HEALTH
- 7 STUDENT HEALTH
- 8 OCCUPATIONAL HEALTH
- 9 EMERGENCY / URGENT CARE
- 10 NEONATAL
- 11 OTHER: _____

Q-22. What is the approximate population of the town in which you practice.

_____ APPROXIMATE POPULATION

Q-23. The type of setting you practice can be described best as: (CIRCLE ONLY ONE)

- 1 INDEPENDENT NURSE PRACTITIONER OFFICE
- 2 PHYSICIAN OFFICE
- 3 AMBULATORY CLINIC
- 4 EXTENDED CARE / NURSING HOME
- 5 SCHOOL / UNIVERSITY
- 6 PUBLIC HEALTH / VISITING NURSE
- 7 VA / MILITARY
- 8 EMERGENCY / URGENT CARE
- 9 OTHER: _____

Q-24. On the average how many hours do you work per week as an advanced practice nurse?

_____ HOURS

Q-25. Approximately how many clients do you see in a typical week?

_____ APPROXIMATE NUMBER OF CLIENTS

Q-26. Would you like to receive a summary of the results of this study?

1 YES

2 NO

COMMENTS

APPENDIX C

HUMAN SUBJECTS LETTER OF APPROVAL

**College of Nursing**

Main Campus
Sherrick Hall
P.O. Box 173560
Bozeman, MT 59717-3560
Phone (406) 994-3783
Fax (406) 994-6020

Billings Campus
Campus Box 574
MSU • Billings
Billings, MT 59101
Phone (406) 657-2912
Fax (406) 657-1715

Great Falls Campus
2800 11th Ave. South
Suite 4
Great Falls, MT 59405
Phone (406) 455-5610
Fax (406) 454-2526

Missoula Campus
32 Campus Drive
Missoula, MT 59812-8238
Phone (406) 243-6515
Fax (406) 243-5745

October 23, 1998

Judy Nicoll, BSN, RN
12720 Camp Creek Rd.
Manhattan, MT 59741

Re. Reflex Sympathetic Dystrophy (RSD) Awareness Study

Dear Ms. Nicoll,

Your revised application for human subjects approval of the above named study has been favorable reviewed and approved. The revisions you made addressed each of the concerns the committee had regarding the risks and benefits to participants, measures to be used to insure confidentiality, and the management of data.

I will forward permission for you to conduct your study to the office of the Associate Dean and your committee Chair. The members of the Human Subjects Review Committee wish you continued success.

Regards,

Charlene "Charlie" Winters, DNSc, RNCS
Chair, Human Subjects Review Committee

cc: HSRC members
Dr. Clarann Weinert, Thesis Chair
Lynn Taylor

APPENDIX D

ONE WEEK FOLLOW-UP POSTCARD



**ABOUT ONE WEEK AGO,
A QUESTIONNAIRE WAS MAILED
TO YOU ABOUT THE DISEASE**

RSD.

If you did not receive the questionnaire or have questions regarding the study, please contact me.

Thank You!

Judy Nicoll RN, BSN, student FNP

MSU College of Nursing

Phone/Fax # (406) 282-7255

e-mail: jnicoll@mcn.net

**Your participation in this study is
IMPORTANT and greatly APPRECIATED!**

APPENDIX E

TWO WEEK FOLLOW-UP POSTCARD



REMINDER

REMINDER

REMINDER

PLEASE COMPLETE AND RETURN
THE RSD QUESTIONNAIRE YOU
RECEIVED IN THE MAIL 2 WEEKS
AGO.

Thank You if you have already responded
Judy Nicoll RN, BSN, student FNP
MSU College of Nursing

**Again, your participation in this study is
IMPORTANT and APPRECIATED!**

APPENDIX F
FOLLOW-UP LETTER A

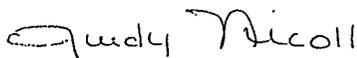
December 1, 1998

Dear Colleague,

It has been approximately one month since you received a questionnaire regarding the disease process Reflex Sympathetic Dystrophy (RSD). As a part of my master's degree, I am attempting to describe the awareness of APRN's in Montana about this complicated disease process. Your participation in this research study is crucial to its success.

Data analysis will begin January 15, 1999. Questionnaires received after that date will not be included. Please take a few minutes to fill out the questionnaire and return it in the self-addressed stamped envelope. Remember all information is confidential and only code numbers are being used for data management and analysis. Please don't hesitate to contact me if you have any questions, concerns, or need another questionnaire. Share your valuable input and add to the important data being compiled to better understand a disease process.

Thank You,



Judy Nicoll RN, BSN student FNP
12720 Camp Creek Rd.
Manhattan, MT. 59741
Phone/Fax#: (406) 282-7255

e-mail: jnicoll@mcn.net

APPENDIX G
FOLLOW-UP LETTER B

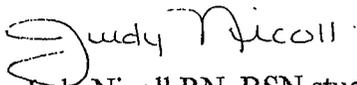
January 6, 1999

Dear Colleague,

It has been approximately one month since you received a questionnaire regarding the disease process Reflex Sympathetic Dystrophy (RSD). As a part of my master's degree, I am attempting to describe the awareness of APRN's in Montana about this complicated disease process. Your participation in this research study is crucial to its success.

Data analysis will begin January 25, 1999. Questionnaires received after that date will not be included. Please take a few minutes to fill out the questionnaire and return it in the self-addressed stamped envelope. Remember all information is confidential and only code numbers are being used for data management and analysis. Please don't hesitate to contact me if you have any questions, concerns, or need another questionnaire. Share your valuable input and add to the important data being compiled to better understand a disease process.

Thank You,



Judy Nicoll RN, BSN student FNP
12720 Camp Creek Rd.
Manhattan, MT. 59741
Phone/Fax#: (406) 282-7255

e-mail: jnicoll@mcn.net

APPENDIX H
THANK YOU LETTER



Thank you very much for participating in the research study about Reflex Sympathetic Dystrophy (RSD). In April, the results of the study will be sent to those who indicated they would like a copy.

At the present time, Montana is one of only four states that does not have an RSD association to aid in educating health care providers as well as the public. I hope to play a role in the development of a Montana chapter. The national RSD association has a web site you may be interested in: www.RSDnet.org

Thank you again for taking the time to assist me in this study. Your support of my research has been deeply appreciated.

Sincerely,

A handwritten signature in black ink that reads "Judy Nicoll". The signature is written in a cursive style with a large, looping initial "J".

Judy Nicoll RN, BSN, student FNP
12720 Camp Creek Rd.
Manhattan, MT. 5974
(406) 282-7255 e-mail: jnicoll@mcn.net

Thank You Packet included: (a) Thank you letter, (b) copy of article, and (c) booklet on RSD.

Article:

Hendler, N. (1997). Reflex sympathetic dystrophy: clearing up the misconceptions. Journal of Workers Compensation, 23 (3), 9-20.

Booklet:

RSD Association. Help Us Stop the Pain.

APPENDIX I
RAW DATA

Age.

Age	Frequency (n)	%
<35	7	3.1
35-44	37	16.4
45-54	104	46.2
>54	77	34.2

N=225

Mean 51

Range 24-69

SD=7.8

Gender.

Gender	Frequency (n)	%
Women	197	87.6
Men	28	12.4

N=225

Highest level of education completed.

Level of Education	Frequency (n)	%
Master's in Nursing	102	45.3
Bachelor's in Nursing	48	21.3
Diploma in Nursing	32	14.2
Bachelor's in Other	17	7.6
Master's in Other	15	6.7
Associate in Nursing	6	2.7
Doctorate in Other	4	1.8
Doctorate in Nursing	1	.4

N=225

Advanced education.

Advanced Education	Frequency (n)	%
Nurse Practitioner	157	69.8
Clinical Nurse Specialist	28	12.4
Certified Nurse Midwife	13	5.8
Certified Nurse Anesthetist	27	12.0

N=225

State received advanced education.

State	Frequency (n)
Montana	46
California	32
Washington	25
Colorado	17
North Dakota	15
Oregon	9
Texas	9
Minnesota	8
Maryland	6
Utah	6
Pennsylvania	4
Virginia	4
Wisconsin	4
Arizona	3
New Jersey	3
New York	3
Ohio	3
Wyoming	3
Alabama	2
Indiana	2
Kansas	2
Kentucky	2
Missouri	2
New Hampshire	2
South Dakota	2
Tennessee	2
Alaska	1
Illinois	1

Louisiana	1
Massachusetts	1
Nebraska	1
New Mexico	1
North Carolina	1
Oklahoma	1
London, England	1

N=225

Years in practice as advanced practice nurse.

Years	Frequency (n)	%
≤5	65	28.8
6-10	56	24.8
11-15	35	15.5
16-20	37	16.4
21-30	26	11.5
>30	6	2.6

N=225

Mean 12

Range 0-39

SD=8.3

Years in Practice as RN.

Years	Frequency (n)	%
≤5	55	24.5
6-10	67	29.9
11-15	48	21.4
16-20	28	12.5
21-30	24	10.7
>30	2	0.9

N=224

Mean 11

Range 0-40

SD=7.4

 Primary area of practice.

Practice	Frequency (n)	%
Family Health	68	30.5
Women's Health	55	24.7
Surgery	26	11.7
Adult	17	7.6
Pediatric	13	5.8
Psych/Mental Health	10	4.5
Student Health	8	3.6
Geriatric	7	3.1
ER/Urgent Care	6	2.7
Occupational Health	5	2.2
Endocrinology	3	.13
Cardiology	2	.8
Oncology	1	.4
Community Health	1	.4
Rehabilitation	1	.4

 N=223

 Practice setting.

Setting	Frequency (n)	%
Physician Office	50	24.8
Ambulatory Clinic	40	19.8
Hospital	31	15.3
Independent NP office	24	11.9
School/University	17	8.4
Public Health	11	5.4
VA/Military	8	4.0
Family Planning Clinic	8	4.0
ER/Urgent Care	4	2.0
Extended Care/Nursing Home	3	1.5
Occupational Clinic	3	1.5
Correctional Facility	1	.5
Secure Care Facility	1	.5

 N=201

 Population of community where practice is located.

Population	Frequency (n)	%
<20,000	94	44.9
20,000-40,000	45	21.5
40,001-60,000	28	13.4
60,001-80,000	17	8.1
>80,000	25	11.9

 N=209

 Hours worked as an APRN per week.

Hours	Frequency (n)
<20	28
20-39	65
40-60	84
>60	6

 N=183

Mean 34.2

Range 2-96

 SD=15.3

 Clients per week.

N=196

Mean 43.3

Range 1-150

 SD=33.5

 Familiarity of arthritis.

Familiarity	Frequency (n)	%
Poor	33	14.7
Fair	82	36.4
Good	99	44.0
Excellent	11	4.9

 N=225

Familiarity of RSD.

Familiarity	Frequency (n)	%
Poor	174	77.3
Fair	41	18.2
Good	8	3.6
Excellent	2	.9

N=225

Familiarity of MS.

Familiarity	Frequency (n)	%
Poor	30	13.3
Fair	136	60.4
Good	54	24.0
Excellent	5	2.2

N=225

Number of clients with disease process assessed by APRN in past 12 months.

Disease Process	Range	Mean
Arthritis	0-550	30
RSD	0-10	.3
MS	0-10	1.2

Continuing education specific to RSD.

	Frequency (n)	%
Yes	2	.9
No	223	99.1

N=225

Continuing education including RSD.

	Frequency (n)	%
Yes	25	11.1
No	200	88.9

N=225

Preference of continuing education modes.

Mode	1 st choice	2 nd choice	3 rd choice
Face to Face	193	8	8
Book Course	9	65	55
Video Course	6	41	53
Audioconferencing		21	21
Videoconferencing	8	60	45
WWW	5	19	28
Audio Course	2	4	4
Journal		1	2

RSD content included in advanced education.

	Frequency (n)	%
Yes	20	9
No	203	91

N=223

Media coverage on RSD.

	Frequency (n)	%
Yes	13	5.8
No	212	94.2

N=225

Family or friends with RSD.

	Frequency	%
Yes	9	4
No	216	96

N=225

Read the article about RSD.

	Frequency	%
Yes	28	13.3
No	182	86.7

N=210

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