Texas
Journal of
Rural
Health

VOLUME XIX, NUMBER 3
2001

TEXAS
JOURNAL
OF RURAL HEALTH

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The purpose of this journal is to provide a forum for sharing ideas
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*Authors are encouraged to submit relevant and current research
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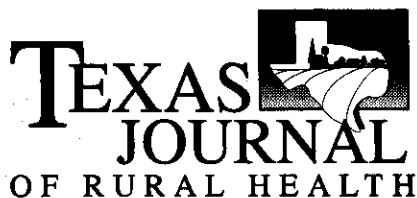"Letters to the Editor."*

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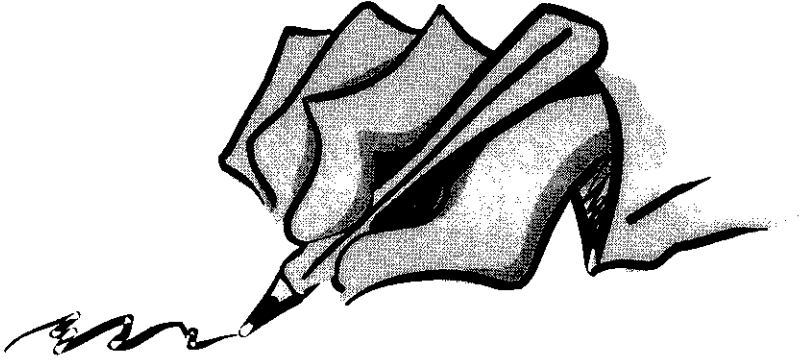
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The articles published in the *Texas Journal of Rural Health* address a variety of topics. Most, however, fall into the four categories we usually associate with the determinants of health: environmental hazards, biology, lifestyle, and health care. For those of us who love order in our lives, this kind of neatness is a joy to behold.

In this issue, David Straus reports on the consequences of mold exposure in buildings. Many homes and workplaces could contain fungi that generate products that negatively affect our health. This is not strictly a biochemical problem, since the decisions people make about the quality of their housing are influenced by socioeconomic circumstances. Certainly, the decisions building owners make about investing in the prevention and cleanup of potential hazards are influenced by economic factors. One might almost say that living or working in housing that is susceptible to hazards is a "lifestyle" issue, but obviously this is something about which many people do not have much choice.

Lifestyle is addressed directly in Josie O'Quinn's article about health-related behaviors. She documents the fact that unhealthy lifestyles are common among the rural health providers whom she studied. This is more than a lifestyle issue affecting the health of rural providers. The behaviors of health care providers set an example for their patients and others in the community. Certainly, advising patients to clean up their acts would be difficult if the provider has the same problems. Therefore, exhibiting unhealthy lifestyles may be an attribute of the
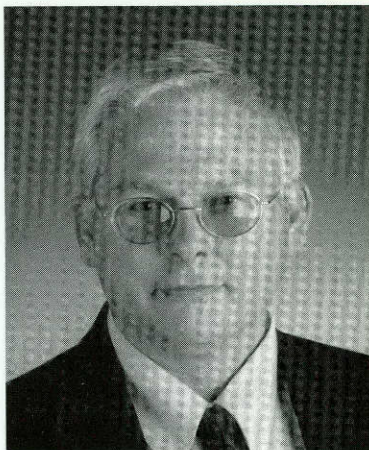
James E. Rohrer, Ph.D.
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rural health care system that contributes negatively to community health. On the other hand, if providers cannot follow lifestyle recommendations, are they perhaps unrealistic for the general public? Here lies food for thought.

Herbal medication usage by Mexican-Americans who have Type 2 diabetes is a biological issue, but also one that is directly relevant to health care delivery. Alternative medicines can interact negatively with prescribed medications, so physicians should be aware of what their patients are taking on the side. Besides, some alternative medicines may be effective. Responsiveness to the rural consumer requires that the doctor "meet them where they live" by at least considering the possibility that active involvement in the

patient's use of herbal medications is a rational and respectful way to work in partnership with patients.

Being respectful of patients' tastes and preferences is a place where community health workers and marketing managers in health care organizations can come together. Borders and Rohrer analyze the patterns of service use of an oft-forgotten market segment: adult men. How would rural health care delivery look if some services were organized so as to be responsive to male consumers? This is a health care issue, but it must be addressed in a fashion that is informed by awareness of gender-related differences in lifestyles.

These four manuscripts demonstrate that the four determinants of health (lifestyle, environment, biology, and health care) inevitably are inter-connected. My goal of an orderly world where things fit into boxes is foiled again. Life is not as simple as we sometimes wish. That includes rural health.

INTERVIEW WITH DENNIS DEGROSS

Lee Ann Paradise
Managing Editor
Texas Journal of Rural Health
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■ INTERVIEW

Often in Texas we discuss how the size of our state effects health care delivery. We address the challenges of distance and geography as we map out our community health care plans. We grapple with tough issues regarding cultural diversity, provider shortages, and meeting the needs of the poor. As the largest state in the nation (bigger than Texas, Montana, and California combined), Alaska is no stranger to these problems. However, like us, many Alaskans are working hard to improve health care in rural communities despite some of the challenges they face. I hope you will read the following interview with interest.

Denny DeGross is the Director of the Alaska Center for Rural Health in Anchorage, Alaska and has been involved in Alaska's health system since 1972. In 1983, Mr. DeGross began a seven-year term as Executive Director for the Alaska Native Health Board (ANHB), which is a statewide Alaska Native advocacy group. Under his leadership, the ANHB gained national recognition by achieving major amendments to Public Law 93-638, Public Law 94-437, and the Federal Tort Claims Act, which brought tribal health programs under federal tort protection. Additionally, during his tenure, programs were begun to: 1) recruit Alaska Natives into health careers; 2) reduce high Native suicide rates; 3) reduce high rates of teen pregnancy among

Alaska Natives; 4) reduce high rates of Fetal Alcohol Syndrome (FAS); 5) clean up toxic waste left near Native villages by earlier private and military activities; and 6) initiate the first program to combat HIV/ AIDS among Alaska's Native people.

*DeGross is the author of **Indians: A Handbook for Counselors** as well as many articles on health issues in Alaska. He has provided cross-cultural/diversity training in more than 100 communities and professional settings. At the 1999 Annual Meeting of the National Rural Health Association in San Diego, DeGross was presented the National Louis Gorin Award for Excellence in Rural Health.*

LP: How does the geography and extreme climate of Alaska effect health care delivery?

DD: Climate and geography is only a problem because of the low population density in Alaska. A larger population often contains the wide variety of human resources that are necessary to meet every medical contingency. Low population density often means that the people living in the geographic "extremities" must travel to their services or those services must come to them on an itinerant basis. When the rivers freeze up, people can drive their snow machines to the clinic. When the river is flowing, but is not carrying huge logs and other debris, people might take their boat to the clinic. During storms or flood conditions none of this is possible.

Many health care providers do not want to live in conditions of geographic or climatic extremes. This makes recruiting people who are willing to live and work in such conditions difficult. Provider

agencies struggle to keep professional providers on the job; there are always many vacancies.

LP: What measures are taken by health care workers to overcome the restrictions of the harsh climate? What role does technology play in shortening the distance between health care provider and patient?

DD: Early ventures into telehealth were undertaken in the hope that giving providers on-site access to higher levels of consultation would reduce the high rates of health workforce turnover. Many providers come to Alaska with a dream of "an Alaskan" experience in their minds, but discover that the "life of the frontier" can be very difficult, requiring the sacrifice of things formerly taken for granted. It is almost impossible to know which prospective health care worker is "made for Alaska," and, on the other hand, which one will jump on the next plane, screaming, "get me out of here!"

The health system in Alaska hopes to achieve the "death of distance" through the use of improved telecommunications technology. While Alaska might seem the ideal place to institute such sophisticated technology, several factors have worked against its rapid adoption.

Parts of Alaska are without sufficient bandwidth capability for the transmission of images. So far very little fiber-optic cable has been put on the ground in Alaska. The best that can be done is through expensive down-links from satellites that can achieve a "virtual" T1 standard.

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In addition, medical providers are slow to adopt new technologies; they represent a "resistance" to the use of new technologies.

LP: Rural communities throughout the United States face recruitment and retention problems. Providing health care workers, especially medical students, with financial incentives is one way to attract them to rural communities. What recruitment measures are commonly utilized by the Alaska Center for Rural Health?

DD: The Alaska Center for Rural Health (ACRH) has very little involvement in the recruitment of providers into Alaska. While ACRH is the AHEC for Alaska, our involvement in workforce issues to date has been in two areas: 1) ACRH places first-year medical students in rural practice sites to be mentored by a local physician. This has proven to be useful in "prejudicing" physicians to choose a rural practice upon completion of their schooling; 2) ACRH performs periodic studies of health workforce needs for the health care system, which are published and distributed as policy analysis to state, federal, and private agencies.

Recruiting in Alaska is a huge problem. The Alaska Hospital and Nursing Home Association, the Alaska Primary Care Association, and the Alaska Native Tribal Health Consortium all actively recruit for their constituencies (hospitals, clinics, and Alaska Native provider agencies). In addition, individual institutions and agencies recruit on their own. Recruiting activities range

from on-line advertisement and applications to the continued use of national magazines and professional journals. As far as I know, few direct subsidies have been used to recruit providers. It is more likely that "an Alaskan experience" will be used. Often, prospective hires are flown up to look around and see if they like it. Even so, many hired people will change their minds when the bad weather starts.

LP: What special skills should health care workers possess in order to meet the needs of the people in rural Alaska? Is special training required for health care educators in the state of Alaska?

DD: A major issue for new hires (especially those who will be working with extremely remote Alaska Native groups) is that they are often totally unprepared to understand and to communicate effectively with the people they will be serving. I know this is difficult for many practitioners to accept – after all, they tend to perceive themselves as honestly and honorably motivated to serve the needs of suffering humanity. For many, the fact that they are in the community of need, and that they possess the skills necessary to make a difference ought to be enough. What's the problem here they ask?

The problem is that this highly motivated, skilled practitioner quite often shows up with a "Hawkeye Pierce" attitude about the situation. Ways of Native thinking and the ways in which Natives communicate ideas are so different from the Western European/ North American ways that a huge gulf of misunderstanding has been created.

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To be sure, these differences have been even more cruelly played out in a much broader range of contacts between the two societies – in education, criminal justice, property rights, employment, etc. Even so, the "helping professions," through a somewhat imperious self-satisfaction with their mission, have hardly questioned their own contribution to the rapid and deadly cultural holocaust that is the real and tragic experience of Alaska Natives and Native Americans in general.

The "dislocation" is indeed deadly. The indigenous societies of Alaska Natives, much like American Indians of the continental United States, and the Native peoples of Hawaii and the South Pacific, are being "ground up" as they scramble to adjust to the relentless media/economics engine of the European/American "mono-culture." The devastation is expressed in persistently low economic status, poor health status, lack of access to necessary services, high suicide rates, high homicide rates, high rates of family dysfunction, truancy, child abuse, etc.

LP: In light of what you've just said, let's talk about the possibility of drilling for oil and building new pipelines in Alaska. There's been a lot of talk about it lately and the nation and people of Alaska seem divided on the issue. In your opinion, if more oil exploration and drilling takes place in Alaska, how could this effect the health of rural Alaskans?

DD: The question of how rural Alaskans will fare – with or without oil exploration and extraction – has more to do with the degree to which rural Alaskans will be "self-determining" in their life choices

than it has to do with the actual exploration/extraction itself. The fact is that decisions on these matters tend to be made outside the affected communities. Self-determination in the form of "sovereignty" has long been a goal of rural Alaska Natives.

LP: With issues of tribal respect being a key element of Alaskan culture, how does progress contribute to a growing sense of social dislocation and what effect does this have on the mental health of tribal members?

DD: The most critical loss to the Native community has been in the loss of speakers of Native languages. The western education system has roughly handled Native languages in the classroom, which has created a widening gulf between older Native people and their grandchildren. Progress has caused a rapid out-migration of Native people from the villages toward the urban centers. These are mostly young Native women – many of them, single parents. They come to Anchorage, Fairbanks, Juneau, and Ketchikan, and take low-paying menial jobs in order to support themselves and their children. Young Native men, possessing hunting, fishing, and wilderness survival skills that are rapidly becoming "redundant" in the new economy, tend to remain in the village. Their days may be spent on their parents' couches watching television. Their evenings are often spent in "bachelor" gatherings where heavy drinking and violence (against self or others) are common.

So much of rural Alaska's physical health problems are psycho-social in origin. Because of that fact, many

observers of Alaska have suggested the need to reduce the dependency of indigenous populations on "government help." They site as an example the "home rule" established in Greenland more than 20 years ago, when the Danes gave that nation back to the Nuuk Inuit peoples who live there. Virtually all of the adverse indicators of poor mental health that were rampant in that population at the time of the transfer of power (i.e., suicide, homicide, child abuse/neglect, substance abuse, and family violence) plummeted with the advent of Native sovereignty. Scholars note that Greenland is the only part of the so-called, "New World," in which indigenous peoples ended up owning and running their own country. Another example has recently developed in Canada, where the recently created "nation within a nation," Nunavut, will give Native peoples living in the far north the right to run their own country. In Alaska, although state government has given lip service to the idea, Native efforts to achieve sovereignty have not received much support within the White, largely urban political center of gravity. It is very clear to Native leaders that the road to better health for their people must aim for self-determination.

LP: From your unique experience in Alaska, what advice would you offer other rural communities throughout the United States with regard to health care?

DD: Learn and use the tools of modern communication, political organization, and the marketing of ideas. Strive to reduce the significance of "place."

LP: What one word or phrase do you associate with the future of rural health care?

DD: "The death of distance."

CONSEQUENCES OF MOLD EXPOSURE IN BUILDINGS

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■■■■ NOTES FROM THE FIELD

ABSTRACT

Scientific evidence is mounting that fungi (a.k.a. mold) growing inside our buildings can be quite detrimental to human health. This problem was recognized over 4000 years ago and was accurately described in Leviticus in the Bible. What we have learned in the ensuing centuries is what fungi cause these types of problems and what the products are that they produce that can damage our health. The fungi most commonly found in "sick buildings" are *Penicillium* species, *Aspergillus* species, *Stachybotrys* species, *Chaetomium* species, and *Alternaria* species. The products that these organisms produce that affect our health are conidia (a.k.a. spores) and mycotoxins.

Key words: mold, fungi, sick building syndrome, spores, mycotoxins. (Texas Journal of Rural Health 2001; 19(3): 8-13)

INTRODUCTION

Sick building syndrome (SBS) is a commonly used term for symptoms resulting from problems with indoor air quality (IAQ). This phenomenon was first recognized as an important problem affecting people inside buildings in 1982 (Finnigan, Pickering, & Burge, 1984). The first official study of SBS

that examined more than one structure was published in 1984 when the World Health Organization coined this term. It commonly refers to a cluster of symptoms resulting from poor IAQ. SBS literally means that conditions exist inside of a building that can make people sick. The symptoms most commonly reported by occupants of a "sick" building are headaches, runny nose and eyes, scratchy throat, and malaise.

Actually, molds (a form of fungi) which grow inside of buildings have been known to produce general problems for many centuries. Indeed, verses in the Old Testament (Leviticus 14:33-45) describe how mildew-infested houses are unfit to occupy, and if the mildew infestation is extensive enough, the house must be torn down.

We breathe microorganisms all the time, whether we are indoors or outdoors. The immune system inside the lungs of healthy, normal individuals usually has no trouble coping with this onslaught of viruses, bacteria, and fungi. We expect that the microorganisms we breathe in inside air are similar to the types of microorganisms we breathe in the outside air. This is what occurs in a "healthy" building. However, if conditions inside a building were to change (e.g., if heavy water intrusion were to occur because of a roof leak, a broken pipe, or a flood), then conditions would exist that would allow microorganisms (particularly fungi) to flourish. We began to use cellulose-containing material as our chief source of building material (sheetrock paper, ceiling tile, particle board) in the middle of the last century. We did this because cellulose is the most abundant organic material on the planet and, therefore, relatively inexpensive. Unfortunately, fungi have one major purpose on this planet – to break down organic material. Therefore, when we let water into our build-

ings in places it should not be, it wets the cellulose and now mold has the two main things it needs to grow – food and water.

THE ORGANISMS

In general, there are four major types of microorganisms: bacteria, fungi, viruses, and parasites. This report will deal primarily with fungi. Also known as mold or mildew, fungi can grow on any carbon source (organic material) when sufficient moisture is available. Fungi produce mycotoxins (mykos is the Greek word for mushroom) and spores. Mycotoxins are secondary metabolites that are excreted into the environment and have direct toxicity for man and his animals. The spores are typically in the 1 to 20 micron range and the small ones can remain airborne for long periods of time. Usually particles less than 7 microns in diameter can enter our respiratory tract. Fungi can produce infectious disease, allergic disease, and toxic disease.

We recently published several studies where we examined the role of fungi in SBS. The first study was a two-year examination of 48 United States schools with IAQ concerns (Cooley, Wong, Jumper, & Straus, 1998). Indoor air, outdoor air, and surface microbial samples were taken with an Anderson Air Sampler, which deposits airborne microorganisms on Petri dishes that contain media that allow them to grow. Results were tabulated according to the areas that were examined. These included indoor complaint areas, indoor non-complaint areas, and outdoors.

Finally, building remediation was performed at all sites where it was needed. This included removal and replacement of building materials that showed water damage, removal

and disinfection of all visible microbial contamination as well as heating, ventilation, and air conditioner (HVAC) remediation. In the 48 examined schools, there were 622 occupants that registered IAQ complaints regarding the building (38% of the total staff). The most common reported symptoms were nasal drainage, congestion, and itchy, watery eyes. Following remediation, questionnaires were again supplied to teachers and staff. The complaint profile following remediation never exceeded 3%, which represented a significant reduction in IAQ problems. Five fungal genera were consistently found in the outdoor air and composed the vast majority of outdoor molds. The genera were, in increasing order of prevalence, *Aspergillus* (1.1%), *Alternaria* (2.8%), *Chrysosporium* (4.9%), *Penicillium* (5.2%), and *Cladosporium* (81.5%). In most schools, there were obvious reductions in the number of fungi in the indoor air samples from non-complaint areas compared with the outdoor air samples, but with similar profiles. In all buildings, the number of *Cladosporium* species was significantly lower in the indoor air samples of non-complaint areas. However, in 25 schools, there were higher concentrations of *Penicillium* species spores in the air from complaint areas. In 11 schools, the microbial ecology of the indoor complaint areas was similar to that in the outside air. However, in these 11 buildings, *Stachybotrys chartarum* was found growing on building surfaces. *S. chartarum* requires a great deal of water to be able to colonize building surfaces and the spores of this organism are very difficult to isolate from the air. In the remaining 11 schools, the fungal profiles were similar in all areas examined. Following remediation of the buildings, fungal air profiles in the indoor air returned to levels similar to those seen in the outside air.

ADDITIONAL STUDIES

The above study identified the fungi that we felt were important in SBS. Since then we have learned a great deal more about this phenomenon. We now know that other genera of fungi are important in SBS. These genera include, but are not limited to, *Chaetomium, Aspergillus, Alternaria, Trichoderma,* and *Memnoniella.*

In a more recent study, we attempted to answer two questions that we felt were very important ones in SBS (McGrath, Wong, Cooley, & Straus, 1999). First, when taking an indoor air sample measurement, is that reading an accurate reflection of the air in that building or is it just a "snapshot" in time that can change immediately after the "picture" was taken? And secondly, do "sick" buildings stay "sick" over an extended period of time, or do they get "better" and then become "sick" again when there is another water event?

This study was performed in 1997 in a multi-story hotel in the southwestern United States. The hotel had a history of client and staff complaints consistent with SBS. IAQ investigators reported musty odors, fungal infestation of the HVAC system, and fungal destruction of building surfaces. In this study, we were granted a six-hour access period to one hotel room experiencing IAQ problems with visible mold growth on the walls. In this room and immediately outside, (via a balcony accessible through a sliding glass door), we examined the fungal ecology of the air. We had recently shown (as described above) that buildings with poor IAQ often have *Penicillium* species in dominance in the air, while "healthy" buildings have a fungal profile similar to the outside air (Cooley et al., 1998). In this instance, we found that the fungal genera most of ten isolated inside and outside were *Cladosporium* and *Penicillium.* However, as was observed before, *Penicillium*

species were always the dominant species in the indoor air (ranging from 150 to 567 colony forming units/cubic meter of air). These numbers comprised 89.8% to 100% of the total mold spores in the inside air. However, in the outside air, the dominant fungal genus was *Cladosporium* in four of the samples taken hourly, while *Penicillium* was the dominant genus in the other two. These data show that while the fungal profile in the outside air is constantly in flux, the indoor air profile in a building with poor IAQ remains relatively constant. Also, we believe this study demonstrates that "sick" buildings tend to stay that way for long periods of time. This is probably because we now build our buildings "tight;" therefore, any contaminants that arise in them have no way to get out. This study also demonstrates that indoor air sampling (e.g., "snapshots") does provide useful information when assessing the IAQ of a building.

HEALTH EFFECTS

What then are the medical implications of exposure to *Stachybotrys* and *Penicillium* in a building? We believe that these two genera effect people in two different ways. Let us first look at the health effects of exposure to *Penicillium* species spores in high concentrations. Other researchers have shown that *Penicillium* species spores in relatively natural states and numbers were potent immunopathogens for asthma (Licorish, Novey, Kozak, Fairshter, & Wilson, 1985). We know that *Penicillium* species spores are small enough (1 to 4 microns) to be inhaled deep within the lungs of men and mice. In a recent study, we allowed mice to respire both viable and non-viable *Penicillium chrysogenum* (PC) spores for a period of six weeks (Cooley et al., 2000). The inhalation of viable PC spores by mice resulted in elevated levels of a serum immunoglobulin (IgE). IgE

production is indicative of an allergic reaction. When proteins were extracted from PC spores and attached to microtiter plates and incubated with serum from animals that received 10^4 viable spores, significant increases in spore-specific IgE and IgG1 were observed compared to controls. In addition, the mice that had inhaled viable PC spores for six weeks showed elevated levels of interleukins (IL) 4 and 5 in their lungs. These substances belong to a group of compounds called cytokines and their presence in the lower respiratory tract indicates that an inflammatory reaction has recently occurred in the lungs. These data suggest that long-term inhalation of viable PC spores induces type 2 T-helper cell-mediated inflammatory responses such as increases in total and spore-specific serum IgE and IgG1, together with bronchoalveolar lavage fluid levels of IL-4 and IL-5, which are allergic reaction mediators.

On the other hand, we believe that the health effects seen in *S. chartarum* exposures are directly related to the mycotoxins the organism produces. This organism produces a number of very potent mycotoxins and its role in SBS is probably more toxic than allergenic (Jarris et al., 1998). The symptoms most commonly reported by those individuals who have been exposed to *S. chartarum* mycotoxins include loss of balance, hearing loss, vomiting, mucosal bleeding (from nose and ears), rashes, hair loss, cognitive dysfunction, and exfoliation. We believe that the above symptoms occur in individuals that have been exposed to low concentrations of *S. chartarum* mycotoxins over a long period of time.

CONCLUSIONS

Studies done by us and others demonstrate that fungi play an important role in SBS. Although the data are strongest for the role of

Penicillium species and *Stachybotrys* species in SBS, we believe that other fungal genera including *Chaetomium* (Abbott et al., 1995), *Alternaria* (Licorish et al., 1985), *Aspergillus* (Hodgson et al., 1998), and *Memnoniella* (Jarvis et al., 1998) are important in SBS. Other workers have suggested that there are associations between chronic repiratory problems, damp housing, and sensitization to mold allergens (Dales, Burnett, & Zwanenburg, 1991). It is clear from our studies and the studies of others that exposure to mold plays an important role in SBS and is something to be avoided.

CONTACT INFORMATION

If you suspect that you have black mold in your home or business, you may want to contact:

Texas Department of Health
Toxic Substances Control Division
Indoor Air Quality Branch
8407 Wall Street, Ste. N 320
Austin, Texas 78754
Phone: (512) 834-6600

ACKNOWLEDGEMENTS

REFERENCES

Abbott, S. P., Sigler, L., McAleer, R., McGough, D. A., Rinaldi, M. G., and Mizell, G. (1995). Fatal cerebral mycoses cause by the ascomycete *Chaetomium strumarum*. *Journal of Clinical Microbiology*, 33, 2692-2698.

Cooley, J. D., Wong, W. C., Jumper, C. A., Hutson, J. C., Williams, H. J., Schwab, C. J., and Straus, D. C. (2000). An animal model for allergic penicilliosis induced by the intranasal instillation of viable *Penicillium chrysogenum* conidia. *Thorax*, 55, 489-496.

Cooley, J. D., Wong, W. C., Jumper, C. A., and Straus, D. C. (1998). Correlation between the prevalence of certain fungi and sick building syndrome. *Occupational and Environmental Medicine*, 55, 579-584.

Dales, R. E., Burnett, R., and Zwanenburg. (1991). Adverse health effects among adults exposed to home dampness and molds. *American Review of Respiratory Diseases*, 143, 505-509.

Finnigan, M. S., Pickering, C. A. C., and Burge, P. S. (1984). The sick building syndrome: prevalence studies. *British Medical Journal*, 289, 1573-1575.

Hodgson, M. J., Morey, P., Leung, W. Y., Morrow, L., Miller, D., Jarvis, B. B., Robbins, H., Halsey, J. F., and Storey, E. (1998). Building-associated pulmonary disease from exposure to *Stachybotrys chartarum* and *Aspergillus versicolor*. *Journal of Environmental Medicine*, 40, 241-249.

Jarvis, B. B., Sorenson, W. G., Hintikka, E. L., Nikulin, M., Zhou, Y., Jiang, J., Wang, S., Hinkley, S., Etzel, R. A., and Dearborn, D. (1998). Study of toxin production by isolates of *Stachybotrys chartarum* and *Memnoniella echinata* isolated during

a study of pulmonary hemosiderosis in infants. *Applied and Environmental Microbiology, 64,* 3620-3625.

Licorish, K., Novey, H. S., Kozak, P., Fairshter, R. D., and Wilson, A. F. (1985). Role of *Alternaria* and *Penicillium* spores in the pathogenesis of asthma. *Journal of Allergy and Clinical Immunology, 76,* 819-825.

McGrath, J. J., Wong, W. C., Cooley, J. D., and Straus, D. C. (1999). Continually measured fungal profiles in sick building syndrome. *Current Microbiology, 38,* 33-36.

REVISION OF MEDICARE REIMBURSEMENT FOR TELEMEDICINE SERVICES

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■ POLICY & LAW

ABSTRACT

From the inner city of Houston to the plains of west Texas, millions of Texans are struggling with having their health care needs met. Many people believe that the segment of the population most in need of better access to health care would be the urban poor. However, there are over 21 million people living in Texas with 3.9 million people living in rural areas. Of the 254 counties in Texas there are 24 counties with no primary care physician, 20 counties with only one primary care physician, and 17 counties with only two primary care physicians (Texas Department of Health, 2001). Residents in the 61 counties with two or fewer primary care physicians also have no direct access to specialty care.

In an effort to offset the barriers to health care that rural populations face, telemedicine systems have been established. Telemedicine is a telecommunications technology that allows the delivery of health care services when distance separates the provider and the patient. However, the use of telemedicine as a means to expand health care coverage to rural populations has faced many barriers, not the least of which is the lack of reimbursement.

Key words: BBA, HCFA, Medicare, rural health, telemedicine. (Texas Journal of Rural Health 2001; 19(3): 14-17)

THE BALANCED BUDGET ACT OF 1997

Congress brought about significant change in Medicare telemedicine reimbursement policy in Section 4206 of the Balanced Budget Act (BBA) of 1997. The BBA mandated that the Health Care Financing Administration (HCFA) provide coverage and payment for professional consultations with physicians and other eligible practitioners via telecommunication systems. This reimbursement policy was for eligible services after January 1, 1999. This mandate was an important starting point in recognizing telemedicine as a reimbursable service, but there were many limitations to the act. According to the BBA the following criteria had to be met in order to receive reimbursement:

- Required use of advanced telecommunications technology including interactive video consultation, teleradiology, and telepathology;
- Patient must be located in a medically under-served area or health provider shortage area;
- Required fee splitting between consultant and presenter – consultant bills full amount, retains 75% and forwards 25% to presenter;
- Required a licensed professional at both ends:
  - *Practitioners who may be consultants:* physicians, physician assistants, nurse practitioners, clinical nurse specialists, and nurse midwives;
  - *Practitioners who may refer:* physicians, physician assistants, nurse practitioners, clinical nurse specialists, nurse-midwives, clinical psychologists, and clinical social workers.

In addition to these requirements there was also no reimbursement for line charges or facility fees (Wachter, 1999).

Due to the number of restrictions on what was reimbursable, Medicare only reimbursed a total of $20,000 for 301 teleconsultation claims between January 1, 1999 and September 30, 2000 (Kumekawa, 2001). Legislators realized that the current limitations for reimbursement for telemedicine needed to be changed. In December 2000, Congress addressed many of these limitations by passing the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 (H.R. 5661). This act expands the benefits for telemedicine services furnished on or after October 1, 2001. Under H.R. 5661 the following provisions have been changed (Library of Congress, 2001):

- **Provides new guidelines regarding areas and sites that are eligible to participate in telehealth.** Beneficiaries eligible for telehealth services must be presented from one of the following areas:
  - An area designated as a Health Professional Shortage Area (HPSA) as defined by §332(a)(1)(A) of the Public Health Services Act.
  - In a county that is outside a Metropolitan Statistical Area (MSA) as defined by §1886(d)(2)(D) of the Public Health Services Act.
  - Entities that participate in a federal telemedicine demonstration project as of December 31, 2000. Such entities are not required to be in a rural HPSA or non-MSA.

- Originating sites that are eligible include:
  - The office of a physician or practitioner.
  - A rural health clinic.

- A critical access hospital.
- A federally qualified health center.
- A hospital.

- **Eliminates the requirement of a telepresenter.** A medical professional is not required to present the patient to the physician or practitioner at the distant site unless the physician or practitioner located at the distant site deems it medically necessary.

- **Eliminates the current fee split require-ments.** HCFA will make payment for eligible telehealth services in an amount equal to what the physician or practitioner located at a distant site would have been paid if the service had been provided without the use of a telecommunications system:
  - Nothing in this subsection prohibits the physician or practitioner at a distant site from sharing with a physician or practitioner at the originating site a portion of the fee that such physician or practitioner receives from the Secretary for an eligible telehealth service.
  - For Medicare payment to occur, interactive audio and video telecommu-nications must be used, permitting real-time communication between the distant site physician or practitioner (site where the physician or practitioner providing the professional services is located at the time the service is rendered) and the Medicare beneficiary.

- **Expands the eligible medical services.** The scope of coverage includes services and corresponding current procedure terminol-ogy (CPT) codes as follows:
  - Consultations (CPT codes 99241-99275).

- Office or other outpatient visits (CPT codes 99201-99215).
- Individual psychotherapy (CPT codes 90804-90809).
- Pharmacologic management (CPT code 90862).

- **Defines who can bill for services.** Medi-care practitioners who may bill for covered telehealth services are (subject to state law):
  - Physician.
  - Nurse practitioner.
  - Physician assistant.
  - Nurse midwife.
  - Clinical nurse specialist.
  - Clinical psychologist. *
  - Clinical social worker. *

* Clinical psychologists and clinical social workers cannot bill for psychotherapy services that include medical evaluation and management services under Medicare. These practitioners may not bill or receive payment for the following CPT Codes: 90805, 90807, and 90809.

- **Establishes a facility fee for the originat-ing site.** For consultation, office or other outpatient visit, psychotherapy and pharmacologic management services delivered via a telecommunications system furnished from October 1, 2001 through December 31, 2002, the originating site fee is the lesser of $20 or the actual charge. After this, the Medicare Economic Index (MEI) will update the fee annually.

- **Introduces eligible store-forward services for Alaska and Hawaii.**

- **Includes language for utilizing telecom-munications technology in home health services.** The language clarifies that

telehomecare is an eligible service under the new Prospective Payment System that governs use of Medicare dollars for homecare (Office for the Advancement of Telehealth, 2001; Department of Health and Human Services, 2001).

- **Sets up a study and report on additional coverage.** The Secretary of Health and Human Services will be required to conduct a study to identify the following:
  - Settings and sites for the provision of telehealth services that are in addition to those permitted under §1834(m) of the Social Security Act, as added by subsection (b).
  - Practitioners that may be reimbursed under such section for furnishing telehealth services that are in addition to the practitioners that may be reimbursed for such services under such section.
  - Geographic areas in which telehealth services may be reimbursed that are in addition to the geographic areas where such services may be reimbursed under such section.

Public sentiments as well as federal directives hold that rural residents are entitled to the same basic level of health care services that urban residents have. One of the greatest barriers to the expansion of the telehealth industry has been the lack of reimbursement for telemedicine services. While H.R. 5661 is a great improvement over the BBA, telemedicine reimbursement by Medicare is a long way from being complete. Groups and individuals alike hope that the study and report, which is due no later than two years after the date of the Act, will bring about additional changes to the current reimbursement policies.

REFERENCES

Department of Health and Human Services (2001). *Program Memorandum Intermediaries/Carrier, May 1, 2001.* [News Release]. Washington, DC: Health Care Financing Administration

Library of Congress (2001). *The Medicare, Medicaid, and SCHIP Benefits Improvement and Beneficiary Protection Act of 2000.* [On-Line] Available: http://thomas.loc.gov/cgi-bin/query/D?c106:1:./temp/~c106A4CMrr:e0:

Kumekawa, J. (2001). *Issue: Legislatvie update.* [On-Line] Available: http://telehealth.hrsa.gov/pubs/legis2001.htm

Office for the Advancement of Telehealth (2001). *2001 Report to Congress on Telemedicine. Payment Issues.* [On-Line] Available: http://telehealth.hrsa.gov/pubs/report2001.pay.htm.

Texas Department of Health (2001). *Texas Counties with Zero, One or Two Primary Care Physicians in Direct Patient Care (as of January 1, 2001).* [News Release]. Austin, TX: Author.

Wachter, Glenn. (1999). *Medicare Reimbursement for Telemedicine.* Telemedicine Information Exchange, November 9, 1999. [On-Line] Available: http://tie.telemed.org.

Prevalence and Patterns of Herbal Medications Usage in Self-Treatment of Symptoms in Mexican-American Patients with Type 2 Diabetes Mellitus

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■■■■■■ RESEARCH

ABSTRACT

A survey was conducted with 67 subjects on the use of herbal medications in addition to or in place of prescribed medications, degree of acculturation, diabetes-related symptoms experienced during the previous month, level of patient involvement in the management of diabetes, and the perception of diabetes control during the previous month. On average, subjects were 64-year-old females, diagnosed with diabetes for 10 years, and exhibiting HbA1c levels of 8.3%. Twenty (30%) of the 67 subjects reported that they used one or more alternative therapies during the previous month, and all affirmed that they did so in addition to and not in place of prescribed hypoglycemic medications.

A significant association was found between herbal medication use and symptomatic disease. Patients who reported suffering more symptoms during the previous month were significantly more likely to add herbal medications to their treatment regimen. Use of a variety of alternative therapies was reported; including nopalitos (nopal cactus), savila (aloe plant), and garlic. Health care practitioners should be aware that many of their patients may be using herbal medications, and they should be familiar with the most commonly used products. Inclusion of these herbal products in the management and

treatment plan of the individual patient may provide a mutual learning experience and an enhanced patient-provider relationship with the ultimate goal of controlling a progressive and potentially devastating disease.

Key words: herbal medications, Mexican-American, self-treatment, Type 2 diabetes mellitus. (Texas Journal of Rural Health 2001; 19(3): 18-28)

INTRODUCTION

Type 2 diabetes mellitus is a major chronic health problem among Mexican-Americans today. Hispanics have a two-fold to three-fold higher risk of developing diabetes after controlling for other risk factors; and Hispanics are nearly five times more likely to suffer the complications of Type 2 diabetes mellitus than are non-Hispanic Whites (Haffner, Hazuda, Braxton, Patterson, & Stern, 1991). When compared with non-Hispanic Whites, Hispanics have a six times greater incidence of end-stage renal disease necessitating dialysis, a two to three times greater incidence of retinopathy, and a significantly increased incidence of vascular complications. Hispanic patients tend to be younger at the time of diagnosis, have higher fasting glucose levels, demonstrate decreased insulin sensitivity and increased insulin response, and are more likely to be treated with insulin (Pugh, Stern, & Haffner, 1986; Haffner, Fong, & VanHeuven, 1988). The reasons for the high prevalence of diabetes in this population are not altogether known, but multiple contributory factors have been suggested. Obesity, physical inactivity, diet, acculturation, and socioeconomic factors are frequently cited in recent studies (Furino & Munoz, 1991; Diehl & Stern, 1989).

Added urgency exists in addressing the needs of this population because Hispanics are the fastest growing minority in the United

States. From 1990 to 2000, the United States Hispanic population increased from 20.8 million to 32.4 million, and it now constitutes one of the largest Hispanic populations in the world. Mexican-Americans make up approximately 64% of this total (United States Census Bureau, 2000). It has been estimated that of the 32.4 million Hispanics in the United States, as many as 8 million have Type 2 diabetes (Davidson, 1997).

One aspect of the cultural heritage of Mexican-Americans that deserves further consideration is the way they have traditionally used the plethora of plants around them for their health needs. The Hispanic family is more inclined to resort to plants and home remedies than is the general United States population (Higgins & Learn, 1999). Throughout Mexico there are markets devoted to buying and selling fresh plants and herbs for their medicinal properties, and in the United States many Hispanic neighborhoods contain *boticas* or herbal pharmacies.

Type 2 diabetes mellitus is a chronic disease managed for the most part by the affected individual who ultimately decides whether to treat symptoms with prescribed therapies and/or use therapies such as special plants or herbal medications. Many health care providers have a limited understanding of such alternative medications. It may prove valuable that health care providers know which herbal medications and home remedies are commonly employed within a community and understand their patients' motivations for using alternative therapies in conjunction with, or in place of, prescribed medications. A better understanding of the decision-making process regarding treatment could aid health providers in dealing with such issues as compliance to prescribed medications, interactions of herbal medications with prescribed medications, patient education, and financial assistance. This knowledge could also serve to improve communication

and strengthen the provider-patient relation-
ship.

RESEARCH QUESTIONS

This study sought answers to the
following questions:
1. What is the prevalence of self-
treatment with herbal medications of diabetes-
related symptoms experienced by Mexican-
American patients diagnosed with Type 2
diabetes?
2. What are the herbal medications
most commonly used for diabetes-related
symptoms by this population?
3. Are there significant associations
between diabetes-related herbal medication
use and age, gender, degree of acculturation,
and body mass index?
4. Are there significant associations
between diabetes-related herbal medication
use and subjective and objective control of
diabetes?

RESEARCH DESIGN AND METHODS

Setting. The target community was Val
Verde County, Texas, located on the Texas-
Mexico border with a 1998 population of
43,831. Seventy-six percent of this total
represents Hispanic residents who are
primarily of Mexican origin (United States
Census, 2000). United Medical Center #3 in
Del Rio, Texas was the site involved in the
study.
Patient Selection. Each Mexican-
American patient presenting with Type 2
diabetes seen at United Medical Center #3
during June and July of 2000 was approached
for participation in the study. No inclusion or
exclusion criteria were used other than that
subjects must be Mexican-American and be

regularly scheduled clinic patients diagnosed
with Type 2 diabetes. All 67 patients who
were asked to participate completed the
survey for a response rate of 100%. There-
fore, the study was conducted with a conve-
nience sample of 67 Mexican-American
patients who had been diagnosed with Type 2
diabetes for at least one year. Each patient
gave informed consent to participate in the
study. Almost one-half of the subjects (n=32)
were in good glucose control and one half
(n=35) were in fair to poor glucose control.
The level of glucose control was classified
according to the participants' most recent
glycosylated hemoglobin results (HbA1c).
Because the United Medical Center authorizes
this test every two to three months for
diabetic patients, each survey participant had
HbA1c drawn at most three months prior to
participation in the survey. HbA1c below
9.0% was considered good control, and above
9.0% was considered fair to poor control
(Gomella, Haist, & Billeter, 1997).
Data Collection. Body mass index, current
medications, and recent HbA1c results were
extracted from patients' medical records. A
survey was used to collect information on the
prevalence of diabetes-related symptoms over
the previous 30-day period, on how active
patients were in the management of their
diabetes, and on any self-care treatments
chosen by individuals to alleviate symptoms
and treat the disease. Of special interest was
the decision to treat symptoms with pre-
scribed therapies and/or to employ alternative
therapies such as special plants and herbs.
The survey also included questions about
age, primary language, length of time residing
in the United States, and use of herbal
medications.
Inquiry on how active a role the patient
played in the management of diabetes in the
previous month consisted of six yes/no
questions regarding blood sugar monitoring,
exercise, diet, and daily examination of feet for

cuts or infections. Subjects reported symptoms experienced in the past month. To make the survey as brief as possible only the symptoms most commonly associated with hyperglycemia (excessive urination, excessive thirst, weight loss, and frequent infections) and hypoglycemia (feeling shaky or nervous, dizziness, feeling confused, tachycardia, and diaphoresis) were included. Symptoms related to both hyperglycemia and hypoglycemia (excessive hunger, frequent headaches, blurred vision, and extreme tiredness) were also included. Categorization of symptoms as associated with hyperglycemia, hypoglycemia, or both was based on descriptions of diabetes-related symptoms and their causes

Table 1. Subject Characteristics (N=67)

	Frequency (%)	Mean (SD)	Range
Age		63.7 (10.2)	31 to 81
Age at Diagnosis		53.1 (10.1)	20 to 71
Gender:			
Female	49 (73.1)		
Male	18 (26.9)		
HbA1c		8.33	5.5 to 15.6
Body Mass Index		33.67 (7.04)	22.1 to 52.6
English Spoken:			
Not at all	37 (55.2)		
Limited	11 (16.4)		
Somewhat well	3 (4.5)		
Well	16 (23.9)		
Nationality:			
Born in United States	28 (41.8)		
Born in Mexico	39 (58.2)		
Spanish as first language	65 (97)		
Spanish spoken in home	59 (88.1)		
Self-reported			
Symptoms:		2.2 (2.4)	0 to 12
0	23 (34.3)		
1 to 3	20 (29.9)		
4 to 6	21 (31.3)		
7 to 9	2 (3.0)		
10 to 12	1 (1.5)		
Total Number of Medications:		5.9 (3.2)	1 to 12
0 to 2	2 (3)		
3 to 5	29 (43.2)		
6 to 8	28 (41.8)		
9 to 11	7 (10.5)		
12 to 14	1 (1.5)		
Patients who Self-monitor Blood Glucose	46 (68.7)		

from several literature sources (Tierny, 1999; Kumar, Cotran, & Robbins, 1997; Isselbacher et al., 1994). However, it should be noted that these symptoms are not always consistent indicators of hyperglycemia or hypoglycemia. Individuals with very high levels of serum glucose can be asymptomatic or the symptom can be caused by some other health condition unrelated to diabetes. Therefore, the symptoms were included based on their most common etiology in persons with diabetes, but not necessarily their only etiology.

The survey was administered orally to the 67 participants in the participants' preferred language (Spanish). Survey questions were read aloud to patients after their regular office visits were completed. The survey required between two to five minutes to complete as patients were not discouraged from elaborating on their responses beyond the scope of the survey.

Statistical Analyses. Statistical analyses were conducted using Microsoft Excel and SPSS (Statistical Package for the Social Science, Ver 9) software. Descriptive statistics were computed for graphical and numerical univariate summaries. Independent t-tests of significance were used to compare mean differences between users and non-users of alternative medications regarding age, age at diagnosis, HbA1c, BMI, total number of medications, mean number of self-reported

Table 2. Herbal Usage by Subject Characteristic (N=67)

	Herb Use	N	Mean	Standard Deviation	SIG (Two-tailed t-test)
Age					
	Yes	20	61.05	9.43	0.163
	No	47	64.87	10.41	
Age at Diagnosis					
	Yes	20	51.00	8.30	0.257
	No	47	54.06	10.66	
HbA1c					
	Yes	20	8.38	2.33	0.886
	No	47	8.30	1.80	
Body Mass Index					
	Yes	20	33.67	7.04	0.226
	No	47	31.33	7.21	
Number of Medications	Yes	20	5.50	2.01	0.392
	No	47	6.04	2.48	
Management Score					
	Yes	20	0.60	0.27	0.482
	No	47	0.55	0.27	
Number of Symptoms	Yes	20	3.2	3.09	0.029
	No	47	1.8	1.99	

symptoms, and mean number of management strategies used (represented as a fraction of 100%). The level of significance was set at p=0.05. A z-test for proportions was used to compare differences between users and non-users of alternative medicine regarding gender and yes/no responses for perception of disease control. Chi-square tests were used to compare differences between users and non-users of alternative medicine regarding ordinal categories of fluency in English and length of time residing in the United States.

RESULTS

The subjects' characteristics are presented in Table 1. Generally, the average age was almost 64. Their average age at the diagnosis of diabetes was 53. The majority were females, were born in Mexico, and spoke Spanish as their first and preferred language. They reported a mean of two diabetes-related symptoms in the past month, and they took an average of almost six medications for their disease. A majority of the participants self-monitored their blood glucose.

Users of herbal medications experienced an average of 3.2 diabetes-related symptoms in the previous month, and non-users reported 1.8 symptoms revealing a significant association between herbal medication use and symptomatic disease (p=0.029). Patients who experienced more symptoms were more likely to add herbal medications to their treatment regimen (see Table 2).

No statistically significant differences were found between users of herbal medications and non-users as associated with chronological age, age at diagnosis of Type 2 diabetes, HbA1c results, BMI, number of medications taken, and reported degree of self-management (see Table 2). Furthermore, subjects' gender, acculturation, and percep-

tions of control of their diabetes-related symptoms were not associated with herbal medication usage (see Table 3).

All of the subjects who reported using herbal therapies in the past month affirmed that they did so in addition to prescribed hypoglycemic medications secondary to the belief that the alternative therapies were of additional benefit in controlling current and long-term symptoms of diabetes. These 20 subjects were taking an average of 1.5 herbal medications. The most commonly used alternative therapies were nopalitos (nopal cactus), garlic, and savila (aloe). Special foods used by these subjects included celery, lemon, apple cider vinegar, apple skin, grapefruit peels, amaranth, pineapple, avena, onions, and okra. These foods were commonly blended with aloe or nopal and taken as a drink, and all were considered by the respondents to help decrease blood sugar or alleviate symptoms (see Table 4).

DISCUSSION

Thirty percent of the subjects who participated in this study reported using herbal medications. This percentage is only slightly above that of the general population, as approximately 25% of Americans who consult their physicians about serious health problems use herbal therapies (Cupp, 1999). The most commonly used herbal medications in this study population were prepared for internal consumption and were readily accessible and inexpensive in the Hispanic community in Del Rio, Texas and neighboring Ciudad Acuna, Mexico. Despite their widespread usage, little is known about the chemical qualities of these plants or their effect on glycemic control.

Nopal (prickly pear cactus) is a significant food source for people along the United

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Table 3. Chi-square Tests of Subject Characteristics by Herbal Medication Use

		Herbal Medication Use		Total	P Value
		Yes	No		
Gender					0.15
Females	Number	17	32	49	
	% within Gender	34.7	65.3	100	
	% within Herb Use	85	68.1	73.1	
Males	Number	3	15	18	
	% within Gender	16.7	83.3	100	
	% within Herb Use	15	31.9	26.9	
Acculturation					0.46
Born in	Number	7	21	28	
United States	% within Nationality	16.7	75	100	
	% within Herb Use	15	44.7	41.8	
Born in	Number	13	26	39	
Mexico	% within Nationality	33.3	66.7	100	
	% within Herb Use	65	55.3	58.2	
English Speaking Capabilities					0.85
None at all	Number	11	26	37	
	% within English	29.7	70.3	100	
	% within Herb Use	55	55.3	55.2	
Limited	Number	3	8	11	
	% within English	27.3	72.7	100	
	% within Herb Use	15	17	16.4	
Well	Number	6	13	19	
	% within English	31.6	68.4	100	
	% within Herb Use	30.0	27.7	28.4	
Perception of Control					0.75
Yes	Number	14	31	45	
	% within Control	31.1	68.9	100	
	% within Herb Use	70	66	67.2	
No	Number	6	16	22	
	% within Control	27	72.7	100	
	% within Herb Use	30	34	32.8	

Table 4. Subjects' Usage of Herbal Medications in General and by Specific Substances

	Frequency	Percent
General Herbal Use	20	29.9
Nopales	14	20.9
Aloe	5	7.5
Garlic	3	4.5
Commercial Herbal Medication	7	10.4
Special Foods	8	11.9

States-Mexican border. It has a rich history of healing throughout many cultures with purported curative effects for diabetes, gastrointestinal disorders, hyperlipidemia, and obesity (Brown, Upchurch, Garcia, Barton, & Hanis, 1998). Nopal is mainly water (85% of its total content) and fiber (Broadhurst, 1997). Studies have been conducted to verify its hypoglycemic efficacy (Ibanez-Camacho & Roman-Ramos, 1979; Frati, Jimenez, & Ariza, 1990; Frati, Gordillo, Altamirano, & Ariza, 1988). One study found that although the cooked and raw nopal cactus were somewhat effective in lowering fasting glucose levels, preparations from commercially dehydrated nopal were not effective. No side effects were observed during or after the administration of nopal in these studies (Frati et al., 1988).

Like the nopal cactus, the aloe plant has a long history as a multipurpose folk remedy. Commonly known as aloe vera, the plant can be separated into two basic products: gel and latex. Aloe gel has been used topically for wounds and skin ailments. Aloe products for internal use have been promoted for diabetes, constipation, cancer and other disorders (Tyler, 1994); however, the only substantiated internal use is as a harsh stimulant laxative for which it has FDA approval. Products derived from aloe gel and intended for internal use have not been proven effective against any disease despite numerous advertising claims (Lulinski & Kapica, 1998).

Garlic and onions (allium satium and allium cepa) have been used in many cultures to treat diabetes and other diseases. In one study, a very large dose of garlic or onion extract lowered fasting blood glucose and improved glucose tolerance (Koch & Lawson, 1996).

Most of the patients involved in this study expressed surprise at being asked about their use of alternative therapies. Often the subjects appeared nervous or hesitant in their responses. Prompts were sometimes used, such as "We all have favorite remedies that we use when we are sick. What have you done to treat your diabetes (Neff, 1997)?" Responses following these prompts ranged from freely given recipes for nopal stems blended, fried, or baked, to statements denying the use of these or any other plants. Most subjects who denied herbal therapy use commented that family and friends either used these plants or recommended their use to lower blood sugar.

The herbal therapies most commonly used by the participants in this study have

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questionable efficacy, and scientific evidence of their value is tentative and incomplete. However, neither have these plants been shown to cause harm or major drug interactions (with the possible exception of Aloe vera latex in its action as a powerful purgative). Also, none of the subjects reported taking herbal medications in place of prescribed medications. It is important to note that patients experiencing higher numbers of symptoms in the previous month were more likely to self-treat with herbal medications. These subjects looked to traditional folk remedies within their cultures that are accessible, economical, and in many cases, validated by family and faith. They may have done so in place of consulting their health care providers, and they had not previously shared this treatment choice with their health providers. This finding should be a concern to health care providers.

Inquiring about the use of herbs, vitamins, and other alternative therapies should be a part of good history-taking along with questions about tobacco and alcohol use. Good communication requires openness to patient choices relating to unconventional remedies as the health care provider works toward shared decision-making in a healthy patient-provider relationship. Clearly, not all Mexican-Americans have exactly the same cultural health practices, and beliefs in traditional medicine are changing. However, health care providers should be familiar with certain cultural and behavioral factors affecting the populations they treat as well as knowledge of common alternative therapies used. Including any herbal product usage in the monitoring of a patient's progress can provide a mutual learning experience and an enhanced patient-provider relationship with the ultimate goal of controlling a progressive disease.

LIMITATIONS

This study was limited by its small sample size. Only 20 of the 67 subjects were using alternative medications, and much of the analyses concentrated on this small subset, creating the possibility that results achieved represent false negatives secondary to the small sample size. Also, these subjects predominantly got their health care at United Medical Center #3. Thus, different patients and practice styles were not included in the scope of this investigation. Many of the patients were without health insurance. Medications at the clinic are five dollars for one month's supply or are given as free samples from drug companies. In general, this is not a population that can afford to buy expensive herbal medications; therefore, non-compliance to prescribed medications secondary to financial limitations is relatively eliminated. Purchasing a month's supply of nopal, aloe, or garlic would be a comparable expenditure.

CONCLUSION

Despite its limitations, this study provided useful information about Mexican-American patients with Type 2 diabetes. The results showed that 30% of the survey participants employed herbal medications in the previous month, and a significant association was found between herbal users and symptoms experienced. Patients experiencing more symptoms were more likely to add herbal medications to their treatment regimens, and they invariably used them in conjunction with conventional medicine. Also, these subjects turned to herbal medications within their culture, notably nopal cactus, and aloe vera.

Studies using a more expansive survey or a qualitative approach may prove useful in further elucidating the reasons why Mexican-Americans turn to these herbal remedies, and what percentage of Mexican-American patients look to alternative therapies instead of conventional medicine.

ACKNOWLEDGEMENTS

The authors wish to thank the staff and patients of United Medical Center #3 in Del Rio, Texas for their cooperation and participation in this study.

REFERENCES

Broadhurst, C. L. (1997). Nutrition and Non-Insulin Dependent Diabetes from an Anthropological Perspective. *Alternative Medicine Review*, 2(5). [Online]. Available: http://www.thorne.com/altmedrev/fulltext/diabetes2-5.html

Brown, S., Upchurch, S., Garcia, A., Barton, S., & Hanis, C. (1998). Symptom related self-care of Mexican Americans with type 2 diabetes: preliminary findings of the Starr county diabetes education study. *The Diabetes Educator*, 24(3), 331-338.

Cupp, M. J. (1999). Herbal remedies: adverse effects and drug interactions. *American Family Physician*, 59(5), 1239-1244.

Davidson, J. A. (1997). *Diabetes among Mexican Americans in Texas*. Austin, TX: Texas Department of Health.

Diehl, A. K., Stern, M. P. (1989). Special health problems of Mexican Americans: Obesity, gallbladder disease, diabetes mellitus, and cardiovascular disease. *Advances in Internal Medicine*, 34, 73-96.

Frati, A. C., Jimenez, E., & Ariza, R. C. (1990). Hypoglycemic effect of opunitia ficus indica in non-insulin dependent diabetes mellitus patients. *Phytotherapy Research*, 4(5), 195-197.

Frati, A. C., Gordillo, B., Altamirano, P., & Ariza, R. C. (1988). Hypoglycemic effect of Opunitia streptacantha lemaire in NIDDM. *Diabetes Care*, 11(1), 63-66.

Furino, A., & Munoz, E. (1991). Health states among Hispanics: Major themes and new priorities. *Journal of the American Medical Association*, 265(2), 255-257.

Gomella, L. G., Haist, S. A., & Billeter, M. (1997). *Clinician's pocket reference scut monkey*, (8th ed.) New York, NY: McGraw-Hill.

Haffner, S. M., Hazuda, H. P., Braxton, D. M., Patterson, J. K., & Stern, M. P. (1991). Increased incidence of type II diabetes mellitus in Mexican Americans. *Diabetes Care*, 14, 102-108.

Haffner, S. M., Fong, D., & Van Heuven, W. A. (1988). Diabetes retinopathy in Mexican Americans and non-Hispanic whites. *Diabetes*, 37(7), 878-884.

Higgins, P. G., & Learn, C. D. (1999). Health Practices of adult Hispanic women. *Journal of Advanced Nursing*, 29(5), 1105-1112.

Ibanez-Camacho, R., & Roman-Ramos, R. (1979). Hypoglycemic effect of opunitia cactus. *Archives of Internal Medicine*, 10(4), 223-230.

Isselbacher, K. J., Braunwald, E., Wilson, J. D., Martin, J. B., Fauci, A. S., & Kasper, D. L. (1994). *Harrison's principles of internal medicine* (13th ed.). New York, NY: McGraw-Hill Inc.

Koch, H. P., & Lawson, L. D. (1996). *The science and therapeutic application of Allium Sativium L. and related species*. Baltimore, MD: Williams & Wilkins.

Kumar, V. A., Cotran, R. S., & Robbins, S. L. (1997). *Basic Pathology* (6th ed.) Philadelphia, PA: W.B. Saunders Company.

Lulinski, B., & Kapica, C. (1998, October). Some Notes on Aloe Vera. [On-line]. Available: http://www.quackwatch.com/ 01QuackeryRelatedTopics/DSH/ aloe.html

Neff, N. (1997). Folk medicine in Hispanics in the southwestern United States. [On-line]. Available: http://www.rice.edu/ projects/HispanicHealth/Courses/mod7/ mod7.html

Pugh, J. A., Stern, M. P., & Haffner, S. M. (1986). Incidence of end-stage renal disease secondary to diabetes mellitus in Mexican Americans and non-Hispanic whites. *Diabetes*, 35, 72A.

Tierny, L. M. (1999). *Current medical diagnosis & treatment* (38th ed.). Norwalk, CT: Appleton & Lange.

Tyler, V. (1994). *Herbs of choice: The therapeutic use of phytomedicinals.* Binghampton, NY: Pharmaceutical Products Press.

United States Census Bureau, Population Division Maintained By: Laura K. Yax (Population Division) Last Revised: May 10, 2000 at 08:17:15 AM. Retrieved September 6, 2000, from the World Wide Web: www.census.gov/population/ www/estimates/popest.html

Identifying Market Segments for Physician Services: Variations by Gender

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■ ABSTRACT

Little attention has been given to the study or practice of market research in ambulatory care. Yet, market research could be quite valuable to physicians and managers attempting to assure patients' efficient and appropriate use of services in a managed care environment. After analyzing survey data with multivariate techniques, we determined that the market for physician services for men should be segmented according to marital status, employment status, and previous in-county hospitalization. This would enable physicians and managers to better develop strategies and implement programs aimed at increasing or decreasing physician service use.

Key words: gender, market research, physician services, rural. (Texas Journal of Rural Health 2001; 19(3): 29-42)

INTRODUCTION

Until recently, health care managers and providers largely ignored market research when planning new services or adjusting existing ones (Berkowitz, Pol, & Thomas, 1997; Wrenn, 1998). Little attention was devoted to the identification of service needs of current or potential patients. Rather, it was commonly assumed that individuals would

willingly use whatever services the health care organization provided (Wrenn, 1998; MacStravic, 1997). Additionally, under the old orientation of health care management, managers were primarily accountable only to themselves and community leaders. Much of this has changed, however, as an era of managed care has sparked greater concern for consumer needs. Health care organizations are now accountable to health maintenance organizations, employer coalitions, and other purchasers of health services for the delivery of efficient and appropriate health services. As these new demands have emerged, managers and physicians have begun to embrace market research as a means of identifying and evaluating consumers' behaviors, needs, and preferences.

Still, health care managers have not fully recognized and adopted market research as an important administrative function. This is unfortunate, because a better understanding of individuals' personal characteristics and their use of physician services could be quite valuable to practice managers and physicians. As managed care organizations increasingly pressure physicians to appropriately and efficiently control utilization, market research could be used to identify particular population segments that are inappropriately high or are low users of physician services. Subsequently, physician services could be added or changed to encourage use among those persons that need more medical care. Moreover, educational and promotional services could be implemented to decrease use among those persons using more medical care than necessary.

This article describes how unique market segments can be identified through a community-based survey of males' and females' social, economic, demographic, and health status characteristics and self-reported use of physician services. Results imply that different factors are related to males' and

females' use of physician services, respectively. Only health status variables were significantly related to females' service use, while health status variables, marital status, and employment status were significantly related to males' service use. Physicians and managers could apply the findings of this study to better define market segments among males and females for the purposes of targeting individuals who should be using more or fewer quantities of physician services.

BACKGROUND

Two key steps in market research are the identification of market characteristics and the segmentation of a market based on those characteristics (MacStravic, 1977). Market identification entails the evaluation of the demographic, social, and economic factors characterizing a market's existing and potential consumers. Market segmentation entails the division of the market into unique groups of consumers, based on market identification, for the purposes of planning unique strategies for each group (MacStravic, 1977; Frank, Massy, & Wind, 1972).

One characteristic frequently used to segment a market is gender. It is well recognized that gender is related to the use of health services and that women use more medical services than men (Cleary, Mechanic, & Greenley, 1982; Nathanson, 1977; Hibbard & Pope, 1983), but little is known about how personal factors influence service use differentially by gender. Most studies simply assume that gender represents a black box of individual differences related to service use; one notable exception is a small set of reports on the use of services by female veterans (Romeis, Gillespie, & Thorman, 1988; Romeis, Gillespie, Virgo, & Thorman, 1991; Weiss &

Ashton, 1994). A more detailed explanation of what factors influence males' and females' service use, respectively, would help managers plan and promote new or existing services.

A model that could be useful in guiding studies of females' and males' access to care is the behavioral model of health. The behavioral model, developed by Andersen in the 1960s and since adapted and refined, has been frequently used in studies to explain and predict the utilization of health services (Andersen, 1995). The original model identifies how predisposing, enabling, and need variables are related to the utilization of health services. Predisposing variables include demographic factors (e.g., age and marital status), social structural factors (e.g., educational attainment, employment status, and ethnicity) and health beliefs. Enabling variables include health insurance coverage, income, having a regular source of care, travel time to care, and social relationships. Finally, need variables include perceived or self-reported health status. We used the behavioral model to guide our identification of market segments among males and females.

METHODOLOGY

Data Source and Study Setting

Data were collected through self-report surveys used as part of a community health needs assessment project at the county level. The survey asked the respondent questions about the major health needs and problems in the county and his/her use of health care services, health behaviors, and demographic information. These questions were developed in consultation with a community advisory council and drew upon items contained in the National Health Interview Survey and other questionnaires. The survey instrument has been used in several assessments of commu-

nity health needs and studies of individual health behavior and service utilization (Rohrer, 1997; Rohrer, Urdaneta, Vaughn, & Merchant, 1998; Rohrer & Culica, 1999). Those interested in viewing a copy of the survey are referred to *Planning for Community-Oriented Health Systems* (Rohrer, 1997).

The survey was mailed to a 15% random sample of households in Howard County, Iowa. Members of the community advisory council publicly promoted the survey during the time of the mailing. Press releases describing the purposes and value of the survey were sent to the local media. Churches were asked to remind parishioners of the survey and advisory council members spoke to local business and service groups about the survey. A second mailing and two reminder postcards further encouraged the return of surveys. A total of 306 surveys were completed and returned, yielding a response rate of approximately 50%. More females (n = 173) responded than males (n = 106). Twenty-seven people did not report their gender and were excluded from the analysis. To limit the potential effects of child-bearing on physician service use, we confined analyses to females 40 years of age and older.

Howard County, one of Iowa's 99 counties, served as the study site. It is typical of counties found in the rural, midwestern United States. The population count was estimated at 9,809 persons in the most recent national census (Iowa Department of Public Health, 1995). Of these residents, 99.6% are White, 21.6% are 64 years of age or older, 72.7% have less than a college education, and the median household income was $21,913. Of the respondents, 100% were White, 34.6% were 65 years of age or older, and 60.1% have less than a college education. Approximately 40% had a household income of $25,000 or less and approximately 38% had a household income of $25,000 to $50,000.

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Independent Variables

The measures of predisposing, enabling, and need variables are similar to those used in other studies (Rohrer et al., 1998; Levkoff, Cleary, & Wetle, 1987; Luft, Hershey, & Morrell, 1976; Bashur, Homan, & Smith, 1994). All of the independent and dependent variables pertained to the individual completing the survey with the exception of family income and the utilization of inpatient or outpatient hospital services. The hospital services variables measured whether the respondent or a member of his or her immediate family had used hospital services in the last year.

Predisposing variables included age (less than 40, 40 to 64, and 65 or older), educational attainment (college graduate or less), marital status (single or married), and location of residence (living on a farm or in town). We did not include ethnicity as a variable because all respondents were White.

Need variables included self-reported general health status. Responses to the measure of general health status were categorized as excellent/very good (only two respondents rated their health as excellent), good, fair, and poor. As a need measure, we also included whether the respondent or a member of his or her immediate family had used inpatient or outpatient services at the local hospital in the past year, and whether the respondent or a member of his or her immediate family had been admitted to a hospital outside of the county in the past year. These measures were included under the hypothesis that previous hospital service use is related to more follow-up and preventive physician office visits. Using a measure of individual or familial use of hospital services is potentially problematic in explaining individual use of physician services. However, this may not be inappropriate, because it is not much of a departure from Andersen's original work which used family characteristics to explain family utilization (Andersen, 1995).

Enabling variables included household income categorized into four levels, employment status (employed/unemployed), and two measures related to health care coverage. The health coverage variables included what type of coverage he or she had (Medicare, Medicaid, commercial, private pay, or other/none), and whether the respondent perceived the insurance coverage as adequate to cover health care costs. We did not include measures of health system characteristics. Because all respondents lived in the same county and, therefore, had access to the same health system, health system factors should have influenced each individual in a similar fashion.

Dependent Variable

The dependent variable was the number of times the respondent reported seeing a physician in the past year. Because the variable was highly skewed, it was transformed by taking its natural log (a value of 1 was added to the variable before transformation, because there is no log of zero). Other work suggests that respondents may slightly overestimate the number of physician visits in the four months immediately before being surveyed, but underestimate the number of physician visits in the two months before that (Nelson et al., 1998). Assuming recall is similar in our study, the reported number of physician visits should provide a reasonable estimate of individuals' use of physician services.

Analysis

A variety of variable reduction techniques, including automatic interaction detector analysis and cluster analysis, are

appropriate when the market researcher is presented with a large number of variables (Green, 1978; Staelin, 1971; Frank, Massy, & Wind, 1972). After the list of variables is reduced, multiple regression analysis can then be used to determine which factors are related to the outcome of interest. When there is not a large number of variables to deal with, analysis can proceed directly to regression methods.

Because this study investigated the relationships between a relatively small number of variables for which a conceptual model already existed, there was no need to use a variable reduction technique. Rather, we used chunk-wise multiple linear regression analysis to determine which predisposing, enabling, and need variables were related to the number of physician visits by males and females. The advantage of chunk-wise regression is that it selects independent variables from related constructs that may not be found through step-wise regression because of multiple collinearity. Analysis proceeds in a two-stage fashion. First, separate models are estimated for each of the main sets of variables (in this case, predisposing, enabling, and need variables). Second, those variables meeting an established level of significance are included in a reduced model used to re-estimate an equation.

In our analyses, equations were modeled for males and females. Thus, there were three models for males and three models for females. A p-value of 0.10 was used in F-tests to determine the models' significance. For those models that were significant, t-tests were examined to determine which individual variables were related to utilization. Those variables that had a t-test with a corresponding p-value of 0.10 or lower were then entered into new, reduced models to re-estimate one equation for males and one equation for females. P-values of 0.05 were used in the reduced models. Tolerance statistics were

evaluated for each model to detect the presence of collinearity, of which none was found.

Missing values for the independent dummy variables were coded as zero (for example, if the respondent failed to report if he or she had Medicare coverage, the dummy variable was coded as 0). Imputation not only increased the sample size used in analyses, but also lowered the chance of falsely rejecting the null that a given variable was statistically significant.

RESULTS

Identification of Market Characteristics

In the first regression analyses, the log of the number of physician visits was regressed on the chunk of predisposing variables. The results are shown in Table 1. Only college education was related to visits among females ($p < 0.052$), whereas only being married was related to visits among males ($p < 0.071$). In the second regression analysis, the log of the number of physician visits was regressed on the chunk of enabling variables. The results are shown in Table 2. No enabling variables were related to visits among females. Being employed ($p < 0.061$) and having Medicaid coverage ($p < 0.065$) were negatively related to visits among males. In the third regression analysis, the log of the number of physician visits was regressed on the chunk of need variables. The results are shown in Table 3. Health status rated as excellent/very good ($p < 0.004$), good ($p < 0.0001$), and fair ($p < 0.003$) were negatively related to the number of physician visits (compared to health status rated as poor) among females, as was an individual or family member being hospitalized outside of the county ($p < 0.016$). Health status rated as good ($p < 0.005$), an individual or family member using any in-county

Table 1. Results of Regression Analyses for Predisposing Models

Variable	Missing Values Excluded		Missing Values Imputed	
	Females b	Males b	Females b	Males b
Intercept	1.42	0.896	1.410	0.940
Age 40-64		0.017		0.052
Age 65+	0.149	0.195	0.121	0.279
College Graduate	*-0.309	-0.148	*-0.304	*-0.149
Married	-0.133	**0.391	-0.102	0.297
Living on a Farm	-0.118	-0.004	-0.153	-0.012
Observations	104	92	107	97
R-squared	0.094	0.109	0.083	0.098
Adjusted R-squared	0.058	0.057	0.047	0.048
F-ratio	2.574	2.095	2.316	1.970
Probability	0.042	0.074	0.0623	0.091

$*p<0.10, **<0.05, ***p<0.01, ****p<0.001$

Note: Age category 40 to 64 was used as the comparison group for females, because women less than 40 were excluded from analyses. Age category 40 or younger was used as the comparison group for males.

hospital services ($p < 0.001$), and an individual or family member being hospitalized outside of the county ($p < 0.057$) were positively related to the number of physician visits among males.

In the final, reduced regression analysis, the log of the number of physician visits was regressed on those variables with p-values of 0.10 or lower in the previous three regression models. The results are shown in Table 4. To allow for easy comparisons, variables were included if they were significant in either the models for females *or* males. The model for females explained considerably less variation in the number of physician visits than the model for males (28% versus 37%). Moreover, there were several differences in the factors

predictive of females' and males' service use. Among females, health status rated as excellent/very good ($p < 0.009$), good ($p < 0.0001$), and fair ($p < 0.008$) were negatively related to the number of physician visits. Individual or family member use of in-county hospital services was positively related to the number of physician visits ($p < 0.024$).

In contrast, among males, health status rates as good ($p < 0.047$), marital status ($p < 0.047$), employment status ($p < 0.020$), and individual or family member use of any in-county hospital services ($p < 0.002$) were significantly related to service use. Individual or a family member hospitalization outside the county approached being significantly related ($p < 0.096$) to service use.

Table 2. Results of Regression Analyses for Enabling Models

| Variable | Missing Values Excluded | | Missing Values Imputed | |
| | Females | Males | Females | Males |
	b	b	b	b
Intercept	0.965	1.629	2.033	1.274
Employed	0.089	-0.768**	-0.809	-0.595*
Income $15-25,000	-0.153	0.086	0.096	0.102
Income $25-50,000	-0.083	0.245	0.214	0.291
Income > $50,000	0.486	0.295	0.340	0.397
Private pay	-0.020	-0.021	0.003	0.070
Commercial Insur.	-0.120	0.147	0.135	0.220
Medicare	0.194	-0.130	-0.129	0.086
Medicaid	0.087	-0.769*	-0.747	-0.791*
Adequacy of Insur.	-0.118	-0.159	-0.187	-0.092
Observations	85	83	80	97
R-squared	0.071	0.186	0.207	0.179
Adjusted R-squared	-0.054	0.086	0.093	0.094
F-ratio	0.568	1.853	1.805	2.110
Probability	0.835	0.073	0.076	0.037

*p<0.10, **<0.05, ***p<0.01, ****p<0.001

Market Segmentation

Based on the results of the reduced models for females and males, respectively, we identified market segments that could be targeted by physicians and managers for the purposes of increasing or decreasing service use. Distribution, product, and promotional strategies are suggested for reaching and affecting each segment. Because insurance status, the adequacy of insurance coverage, and income were not independently related to service use in the market under study, pricing strategies were disregarded.

Our recommendations focus on segmenting markets among males rather than females, because only health status factors were identified through regression analyses as related to females' use of physician services. Women who rated their health status as excellent/very good, good, or fair visited physicians fewer times in a one-year period than women who rated their health status as poor. This was expected, for women who rate their health status more favorably are likely not to need to use more services. The market could be segmented according to the use of in-county hospital services in the past year. Women or a family member who used any in-county hospital services in the past year had more physician visits than those who did not (4.18 versus 3.12 visits) as shown in Figure 1. Adjusted and unadjusted means of the log of the number of visits are also shown in Figure 1. However, the way to interpret this finding for developing a marketing strategy is not

Table 3. Results of Regression Analyses for Need Models

Variable	Missing Values Excluded		Missing Values Imputed	
	Females b	Males b	Females b	Males b
Intercept	1.711	1.057	1.698	1.183
Health Exc./Very Good	-0.818*	-0.327	-0.815**	-0.458
Health Good	-0.903***	-0.480*	-0.895****	-0.608***
Health Fair	-0.572**	-0.036	-0.525***	-0.186
Used Hosp. in County	0.082**	0.464***	0.086**	0.456****
Hospitalized Outside	0.394****	0.278	0.416****	0.323*
Observations	97	91	107	97
R-squared	0.231	0.257	0.253	0.267
Adjusted R-squared	0.189	0.213	0.216	0.226
F-ratio	5.463	5.871	6.832	6.614
Probability	0.0002	0.001	0.0001	0.0001

*$p<0.10$, **<0.05, ***$p<0.01$, ****$p<0.001$

altogether clear. Theoretically, women who use hospital services would need to have more physician visits for follow-up care. However, women whose family members use more services may inappropriately be using too many services. For example, an individual whose family member has been hospitalized may be overly attentive and concerned about her own health and, thus, seek medical care to reduce that concern. We do not suggest that any specific marketing strategy be developed for such individuals, but posit that physicians may need to monitor the use of physician services by individuals with a family member who has used hospital services in the past year.

Our findings regarding males' use of services are more meaningful as they suggest that the market should be segmented along predisposing factors in addition to need factors. First, as demonstrated in Figure 2, married males had a higher number of physician visits in the past year than their single counterparts (2.31 versus 3.54 visits). There are a number of possible explanations for this. For example, it is quite possible that wives play an important role in their husbands' decisions to seek medical care. Efforts to decrease (or increase, when appropriate) married males' use of services might include promotional programs directed at wives such as education about common medical illnesses afflicting males. Different approaches may be needed to affect single males' use of services. Because single males are likely to have more time flexibility, it is most plausible that strategies of product and promotion could have a bigger impact on their service use. For example, physician practices may simply need to offer new products such as sports or farm

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Table 4. Results of Regression Analysis for Reduced Models

| Variable | Missing Values Excluded | | Missing Values Imputed | |
| | Females | Males | Females | Males |
	b	b	b	b
Intercept	1.788	1.210	1.721	1.228
College Graduate	-0.137	-0.103	-0.187	-0.141
Married	-0.122	0.335**	-0.120	0.276**
Employed	0.177	-0.285*	0.167	-0.337***
Medicaid	-0.145	-0.475	0.121	-0.510
Health Exc./Very Good	-0.839***	-0.353	-0.795***	-0.148
Health Good	-0.901****	-0.490*	-0.866****	-0.491**
Health Fair	-0.576**	-0.144	-0.499***	-0.133
Used Hosp. Services in County	0.115	0.367**	0.099	0.412***
Hospitalized Outside County	0.332*	0.251	0.404**	0.270*
Observations	91	83	107	97
R-squared	0.242	0.339	0.276	0.368
Adjusted R-squared	0.158	0.257	0.209	0.302
F-ratio	2.873	4.150	4.114	5.617
Probability	0.005	0.0002	0.002	0.0001

*$p<0.10$, **<0.05, ***$p<0.01$, ****$p<0.001$

injury services. Health fairs could be held at area schools, churches, and social groups to promote preventive health behaviors and physician service use.

In regard to employment status, employed males visited physicians approximately half as often as unemployed males (2.41 versus 4.59 visits as shown in Figure 3). Our recommended strategies focus on distribution, product, and promotion. First, office hours could be extended into the evening or weekend or limited services could be offered at local factories to improve access for employed males. Product strategies could include reducing waiting times to limit time away from work. Educational programs on common medical problems, exercise, and stress control could be held at local churches, social groups, or large businesses to heighten employed males' concerns for their health and potentially increase physician service use.

Finally, as was the case for females, males who themselves or one of their family members had used in-county hospital services in the past year visited physicians more often than those who did not use in-county hospital services (3.84 versus 2.23 visits) as shown in Figure 4. As discussed earlier, how to interpret this finding is unclear. Males who used in-county hospital services may truly need to have more physician visits. Males whose family members used in-county

hospital services may be inappropriately using too many physician services because of a number of reasons. We recommend taking a similar approach to this market as was suggested for females who themselves or a family member used in-county hospital services.

DISCUSSION AND CONCLUSION

Health care managers are only beginning to recognize the benefits of market research (Wrenn, 1998; Berkowitz, Pol, & Thomas, 1997), but market research could be quite valuable to managers and physicians operat-

ing in a managed care environment. As this study has shown, market research can be used to identify segments of individuals within a market that under-utilize or over-utilize physician services. Managers of capitated physician practices should find market segmentation particularly useful as they design strategies to maintain and promote patients' health while also controlling costs. Managers of physician practices attempting to gain participation in preferred provider networks, which are more common in rural areas such as Iowa, should see similar benefits in market research.

The results of this study imply that different factors are related to females' and

Figure 1. Mean Number of Visits for Females by Use of In-county Hospital Services
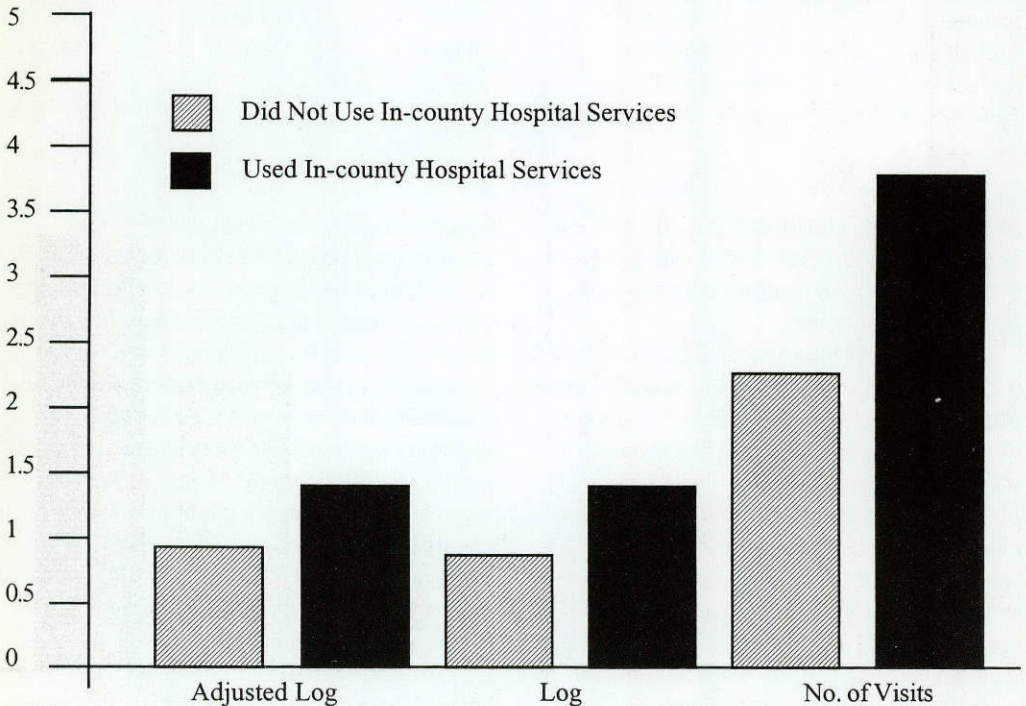
males' utilization of physician services over the past year. Only health status variables were related to the number of physician visits by females, whereas marital and employment status were related to the number of physician visits by males. Additionally, several enabling variables including income, type of insurance coverage, and the adequacy of insurance coverage were not independently related to the frequency of service use. In rural areas, such as Iowa, these factors may simply not vary much and, therefore, may not impact utilization. Moreover, rural residents may have strong social and family networks that help assure they receive medical care, despite limited financial resources. If this is

the case, then practice managers and physicians should be able to focus on the other variables identified thus far as related to males' and females' use of services.

It is possible, however, that we did not identify all relevant variables related to service use especially among women. While we found that perceived health status was significantly related to females' (and males') use of health services, health status did not explain much variation in females' service use. Our measures may not have captured the full domain of females' health status. For example, our study also did not include a measure of concern for health, a component of the health belief model, which has been

**Figure 2. Mean Number of Visits by Married and Single Males**
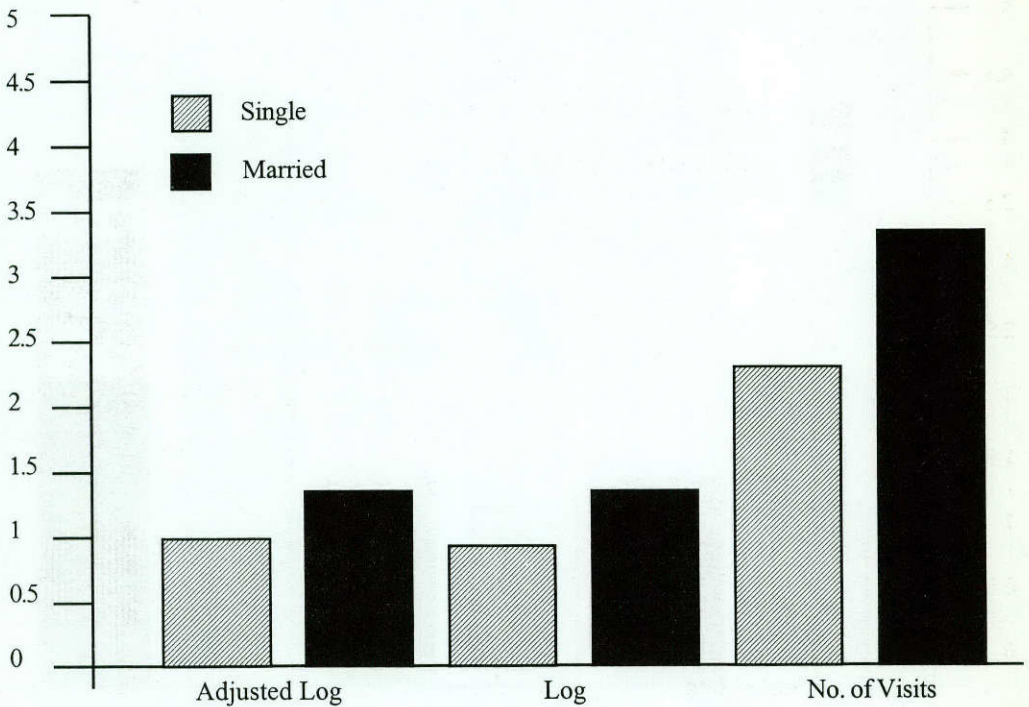
found to be a significant predictor of females' service use (Hibbard & Pope, 1983). Additionally, social psychological factors, such as social support, could influence individuals' perceptions of need and subsequent health care utilization.

More interestingly, none of our measures related to socio-cultural factors, such as marital status and employment, were related to females' use of health services. Especially surprising is the observation that employment status is not related to females' use of health services, because one might expect that women who work have less time to access health services. Again, our measures may not have fully captured the socio-cultural phenomenon related to females' service use or the behavioral model may not adequately

explain these relationships. Other socio-cultural variables, such as religion or ethnicity, may influence whether a person seeks care. For example, some ethnic groups may be more willing to delay access to medical care. We recommend that future research address the affects of religion, ethnicity, beliefs about the benefits of medical care, and social support on service use. These could prove to be important factors on which to segment the market for physician services.

In closing, while our results are primarily applicable to other rural counties in the midwestern United States, our methodology could be used by ambulatory care groups in suburban or urban counties to identify and target unique market segments. We recom-

Figure 3. Mean Number of Visits Unemployed and Employed Males
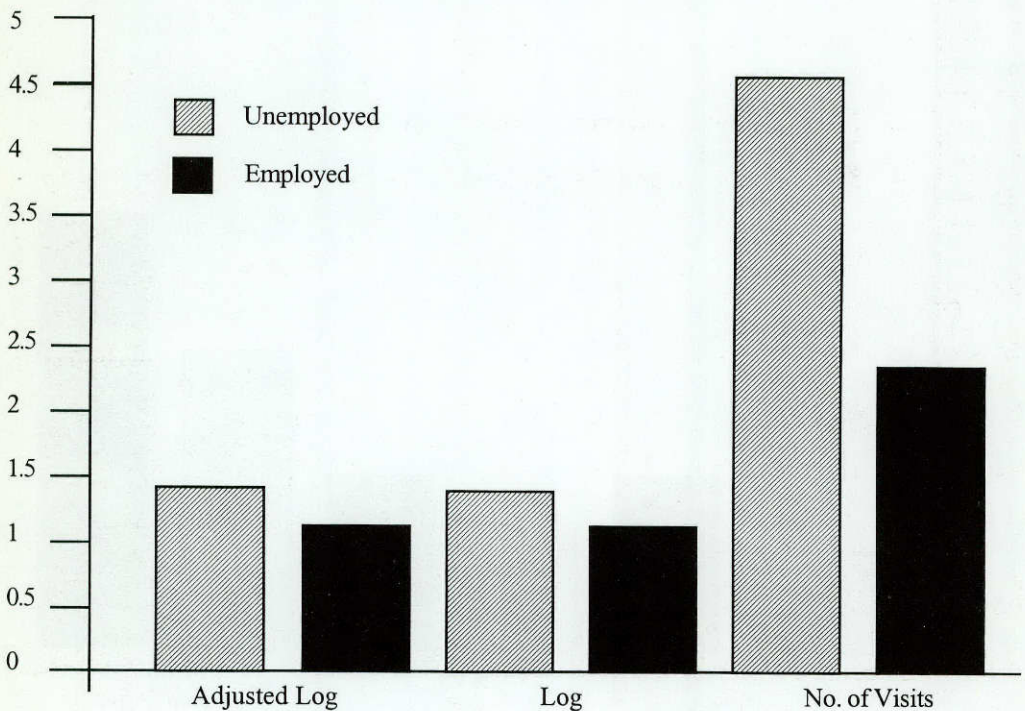
mend that physician groups, perhaps in conjunction with their local hospital and/or public health authority, conduct their own market surveys. Data from these surveys could not only be used to develop market segments, but also to evaluate the community's overall health needs and concerns.

ACKNOWLEDGMENTS

REFERENCES

Andersen, R. M. (1995). Revisiting the Behavioral Model and access to medical care: Does it matter?" *Journal of Health and Social Behavior,* 36, 1-10.

Bashur R. L., Homan, R. K., & Smith, D. G. (1994). Beyond the uninsured: Problems in access to care." *Medical Care,* 32(5), 409-419.

Berkowitz, E. N., Pol, L. G., & Thomas, R. K. (1997). *Healthcare Market Research: Tools and Techniques for Analyzing .Today's Healthcare Environment.* New York, NY: McGraw Hill.

Figure 4. Mean Number of Visits for Males by Use of In-county Hospital Services
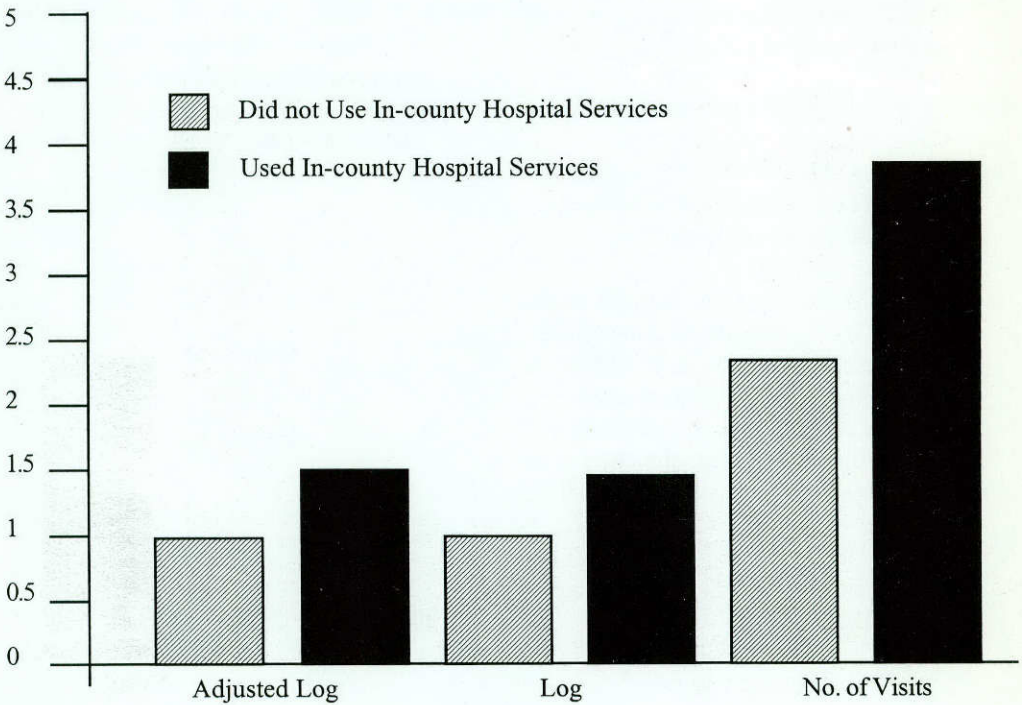
Cleary, P. D., Mechanic, D., & Greenley, J. R. (1982). Sex differences in medical care utilization: An empirical investigation." *Journal of Health and Social Behavior,* 23, 106-119.

Frank, R.E., Massy, W.F., & Wind, Y. (1972). *Market Segmentation.* Englewood Cliff, NJ: Prentice-Hall.

Hibbard, J.H. & Pope, C.R. (1983). Gender roles, illness orientation and use of medical services. *Social Science and Medicine,* 17(3): 129-137.

Iowa Department of Public Health. (1995). *Iowa Primary Care Access Plan.* Des Moines, IA: Iowa Department of Public Health Primary Care Office.

Luft, H. S., Hershey, J. C., & Morrel, J. (1976). Factors affecting the use of physician services in a rural community. *American Journal of Public Health,* 66(9), 865-871.

Levkoff, S.E., Cleary, P.D., & Wetle, T. (1987). Differences in determinants of physician use between aged and middle-aged persons. *Medical Care,* 25(12): 1148-1160.

MacStravic, R.E. (1977). *Marketing Health Care.* Germantown, MA: Aspen.

Nathanson, C.A. (1977). Sex, illness, and medical care: A review of data, theory, and method. *Social Science and Medicine,* 11, 13-25.

Nelson, E. C., McHorney, C. A., Willard, W. G., Rogers, W. H., Zubkoff, M., Greenfield, S., Ware, J. E., & Tarlov, A. R. (1998). A longitudinal study of hospitalization rates for patients with chronic disease: Results from the medical outcomes study. *Health Services Research,* 32(6), 759-774.

Rohrer, J. E. (1997). *Planning for Community-Oriented Health Systems.* Baltimore, MD: AUPHA.

Rohrer, J. E. & Culica, D. (1999). Identifying high users of medical care in a farming-dependent county. *Healthcare Management Review,* 24(4), 28-34.

Rohrer, J. E., Urdaneata, M., Vaughn, T., & Merchant, J. A. (1998). Physician visits in a farming dependent county." *Journal of Rural Health,* 14(4), 338-453.

Romeis, J. C., Gillespie, K. N., & Thorman, K. E. (1988). Female veterans' use of health care services. *Medical Care,* 26(6), 589-595.

Romeis, J. C., Gillespie, K.N., Virgo, K.S., & Thorman, K.E. (1991). Female veterans' and nonveterans' use of health care services. *Medical Care,* 29(9), 932-936

Staelin, R. (1971). Another look at A.I.D. *Journal of Advertising Research,* 11(5), 23-28.

Weiss, T. W. & Ashton, C. M. (1994). Access of women veterans to veterans affairs hospitals. *Women and Health,* 21(2/3), 23-38.

Wrenn, B. (1998). Health care marketing. In W.J. Duncan, P. M. Ginter, & L. E. Swayne (Eds.) *Handbook of health care management* (pp. 255-275). Malden, MA: Blackwell.

HIV Testing Experiences of
Pregnant Women In South Texas

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◾ ABSTRACT

Anti-retroviral drugs and testing of pregnant women has lowered perinatal HIV (human immunodeficiency virus) transmission in the United States. This study interviewed women with HIV infection in south Texas to examine how testing during pregnancy was experienced. While 27/29 women received HIV testing and anti-retroviral treatment, only four women received information about the test. Many physicians (55%) refused to continue prenatal care after learning the woman's HIV status. In addition to decreasing perinatal transmission, policy-makers must consider unintended consequences of making HIV testing a de facto standard of prenatal care.

Keywords: anti-retroviral treatment, HIV testing, pregnant women, prenatal care, South Texas. (Texas Journal of Rural Health; 19(3): 43-51)

INTRODUCTION

Since the mid-1990s there has been a striking decline in the number of deaths from acquired immunodeficiency syndrome (AIDS) in the United States due to rapid advances in HIV (human immunodeficiency virus) therapy. Prevention of new cases of HIV disease has been more difficult to curtail, with an estimated 40,000 people becoming infected

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annually in the United States. A notable exception is mother-to-child transmission of HIV, which has dramatically declined. Each year in the United States, approximately 7,000 HIV-infected women give birth (CDC, 1999; Davis, Gwinn, Wasser, Fleming, & Karon, 1993).

Prior to 1994, about 25% of pregnant women with HIV transmitted HIV to their infants. In 1994, the results of the AIDS Clinical Trials Group 076 (ACTG 076) study showed that women who took the anti-retroviral agent zidovudine (ZDV) during pregnancy reduced the risk of transmission to 8% (Connor et al., 1994). The two-thirds reduction in risk of maternal-infant transmission has been confirmed in numerous subsequent studies (Matheson et al., 1995; Fiscus et al., 1996; Simpson, Shapiro, & Andiman, 1997; Mandelbrot et al., 1998). Since the ACTG study, simpler ZDV protocols, other anti-retroviral medications, such as nevirapine, and triple anti-retroviral therapy have been shown to reduce vertical HIV transmission as well (Perinatal HIV Guidelines Working Group Members, 2001; Lallemant et al., 2000; Kaplan et al., 1999; Wade et al., 1998). Elective caesarian section delivery performed prior to the onset of labor, before the highest risk for transmission occurs also reduces maternal-infant transmission (Mandelbrot et al., 1998).

The results of these studies have led to strong recommendations by the United States Public Health Service, the American College of Obstetricians and Gynecologists, and the American Academy of Pediatrics that HIV testing should be offered to all pregnant women in the United States (AAP/ACOG, 1999; CDC, 1995). Implementation of these testing and treatment recommendations has led to a dramatic decrease in perinatal acquired HIV infection with cases decreasing 43% in the United States between 1992 and 1996 (CDC, 1997b).

The law as defined in the Texas Health and Safety Code §§ 81.090 (1995), which went into effect on January 1, 1996, mandates that health care providers offer pregnant women HIV testing during the initial prenatal visit and at delivery. The law includes provisions that women be: 1) offered pre-test counseling and informed of their right to refuse HIV testing; 2) informed that test results are confidential and that anonymous testing is available if desired; and 3) provided with written information, available for free in English and Spanish from the state health department, about sexually transmitted diseases (STDs) and HIV/AIDS. According to the Texas Health and Safety Code §§ 81.090 (1995), women who test positive for HIV are to be provided with information about ZDV treatment along with appropriate counseling and referral for treatment. Since implementation of that law, HIV/AIDS programs in south Texas have reduced mother-to-child HIV transmission to approximately 5% (unpublished data).

Policies about HIV testing have generally stressed the voluntary nature of testing and the need for pre-test and post-test counseling (CDC, 1994a; Nakchbandi et al., 1998). Ideally, counseling for a person who tests positive for HIV provides information on the meaning of the diagnosis, treatment and medication options, implications for partners and children, and referrals for medical care, psychological counseling, and substance abuse treatment as appropriate (CDC, 1994a). However, clinician concerns about the quality of HIV counseling are often secondary to the urgent policy need to identify and treat infected women and decrease perinatal HIV transmission (D'Angelo, Belzer, Futterman, & Peralta, 2000). The purpose of this study was to examine the experience of testing and receipt of positive HIV test results by pregnant women in Texas who were tested after the mandatory perinatal testing law went into effect.

METHODS

Semi-structured, open-ended interviews were conducted face-to-face and by telephone between August 1998 and April 1999 with a convenience sample of 29 women receiving clinical care at a Ryan White Title IV clinic in south Texas. All were HIV positive and had delivered babies after the passage of the Texas Health and Safety Code §§ 81.090 (1995) in January 1996. The women were questioned about the circumstances related to their HIV antibody tests and their positive HIV test results. Demographic information was also collected. Informed consent was obtained. Ten-dollar grocery store vouchers were given as token compensation for participation. Permission to conduct the study was obtained from the institution's Institutional Review Board. Results of the questionnaires were entered into a Microsoft® Access database and SPSS 7.5 was used to generate descriptive statistics. Responses to open-ended questions were reviewed for common themes (i.e., positive experiences, negative experiences, staff attitudes) and grouped. The investigators developed and agreed upon the composition of themes.

RESULTS

There were no differences in HIV risk factors (i.e., heterosexual contact, injecting drug use) among the study participants. The majority of the women were of Hispanic descent with the United States as their country of birth. Additional demographic and selected characteristics of the women are presented in Table 1.

Twenty-three of the 29 women (79%) received HIV testing during their pregnancy (Table 2). Nine of the 29 women knew of their

Table 1. Description of the Study Population (N = 29)

	(n)	%
Country of Birth		
United States	24	82.8
Mexico	4	13.8
Puerto Rico	1	3.4
Ethnicity		
Caucasian	4	13.8
African-American	5	17.2
Hispanic	20	69.0
Education		
< High school	12	41.4
H.S. graduate/GED	8	27.6
Some college	8	27.6
College graduate	1	3.4
Health Insurance		
Medicaid	21	72.4
Private	1	3.5
None	7	24.1
Age at Delivery		
≤20	6	20.7
21-29	14	48.3
30-39	9	31.0
Number of Children Delivered by Year		
1996	7	24.1
1997	4	13.8
1998	16	55.2
1999	2	6.9

Table 2. Status of HIV Positive Pregnant Women to ZDV Protocol (N = 29)

	(n)	%
Tested During Pregnancy	23	79.3
Tested at Delivery	4	13.8
Not Tested (Prior Knowledge of HIV)	2	6.9
Received ZDV Protocol	27	93.1
Did not Receive ZDV Protocol	2	6.9

Table 3. HIV Status of Children whose Mother Received ZDV (N = 29)

	(n)	%
HIV Infected	2	6.9
Not Infected	27	93.1

HIV status prior to the pregnancy and told their providers, four women (14%) were tested at delivery, and two (7%) did not receive prenatal care. Twenty-seven of the 29 women (93.1%) who knew or learned of their HIV status during their pregnancy received ZDV or other anti-retroviral medication during the pregnancy (see Table 2). Two of 32 children (6.2%) had HIV infection; they were born to women who had received ZDV therapy during their pregnancy (see Table 3). Thirty of 32 were not infected as determined by loss of maternal antibodies by 15 months or two negative PCR tests.

In terms of the provisions of Texas law, 23/29 (79%) women were told that they were being tested for HIV and one of these signed a consent form; 11/29 (38%) were told they could refuse to have an HIV test (see Figure 1). Only four women were given the minimal education required by the state law, that is, a pamphlet with HIV information.

Even two to three years after learning of their HIV serostatus, many of the women in this study remained upset and angry about the manner in which they were given their results. Two women reported they were given their HIV positive test results over the telephone and two others were given their results with their husbands present. It was not uncommon for women to be given **no information** (*"When I was called to come back in, I was asked about promiscuity with other men. Then I was told I was HIV positive. I was given no other information on HIV, just referred out."*), given **incorrect information**, (*"Doctor was telling me I needed to have an abortion." "I was told I could possibly die in the next six months."*), or treated in what they considered a **condescending or unprofessional manner.** Some examples of this are shown below:

"He just put the paper in front of me and said, you are HIV positive and here are the tests to prove it. My husband asked the doctor to explain it, but he didn't in any way that we could understand."

"One nurse put on three pairs of gloves just to remove paper from the exam table."

"He [the doctor] made me wait until all of the patients in the office were gone, then came in and told me I was positive."

Only eight of the 29 (28%) women could recall being given their HIV test results in a professional manner. Below are representative examples:

"The obstetrician had someone from the AIDS agency [in the office when she was given the results] to speak with me."

"[When I came in for results] she was nice and thorough and answered all of my questions. I was told I could have an abortion, but that it was my decision."

"Doctor and nurse told me together--they were nice and compassionate."

"The nurse was very sympathetic and gave me lots of pamphlets."

After delivering the news about their HIV status, providers for more than half the women (16/29, 55%) refused to continue to

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Figure 1. State of Texas, Health and Safety Code Legal Requirements for HIV Testing in Pregnancy

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State of Texas Health and Safety Code, § 81.090

■ A physician or other person permitted by law to attend a pregnant woman shall:
  • At the 1st prenatal clinic visit – take a blood sample and perform a serologic test for HIV.
  • On admission for delivery – take a blood sample and perform a serologic test for HIV.
■ The laboratory performing the serologic test must be approved.
■ The physician or other person permitted by law shall advise the woman that the test is confidential but not anonymous, <u>and</u>
  • Distribute printed materials about HIV/AIDS prior to taking the blood sample.
  • Notify the woman that **a test will be performed <u>if the patient does not object</u>** (test may not be conducted if the woman objects).
  • Refer women to an anonymous testing facility or instruct them about anonymous testing methods if they object to the test.
  • Note on the medical record that printed materials were distributed and verbal notification given.
■ Printed materials (available from the Texas Department of Health) provide information on incidence and transmission of HIV, how HIV can affect the health of their child, treatments available to prevent maternal-infant transmission. (Physician shall make materials available in another language as necessary, or in a form understandable to someone who is illiterate.)
■ If the serologic test confirms infection, the law requires that the woman be provided with information related to treatment & counseling (may refer to a facility that provides treatment for HIV for counseling).

provide prenatal care services. Comments included:

"The doctor was very rude. He told me I had AIDS and that he couldn't see me anymore."

"The doctor told me I needed special care because I was HIV positive. He gave me a list of obstetricians in the area. I started calling them. The first two told me they couldn't treat me."

"I spent the last six months of my pregnancy [in another city two hours from my home] because there was no one [in my community] to care for me."

"The doctor brought me into the office, told me I was HIV positive, laid the paper on the desk and read it, told me to take medication five times a day. I never saw her again."

DISCUSSION

The purpose of this small qualitative study was not to make generalizations about all physicians in Texas. Rather, the study was designed to provide a snapshot of pregnant women's impressions of their HIV testing experiences as a result of women, referred to a Ryan White clinic, describing unsatisfactory experiences with testing. The results suggest that while pregnant women with HIV infection in south Texas are being identified and offered drug treatments to reduce transmission risk to their infants, there are problems in HIV testing procedures, with providers in public clinics and obstetricians in private practices alike often not meeting the requirements that accompany HIV testing. Many participants reported that physicians appeared to either lack knowledge about HIV and pregnancy or were unwilling to take the time to discuss the emotional issues involved. For some physicians, HIV seems to be one more test to add

to the standard panel already performed on pregnant women with little regard to the emotional impact that a positive test result might carry.

The study findings suggest a possible need for additional physician education regarding counseling, administration, and interpretation of HIV tests. Since the original ZDV protocol is being rapidly updated and replaced with new approaches to the treatment of pregnant HIV-infected women, the need for ongoing training will increase. Such training should go beyond the medical issues related to test interpretation and medications and include information regarding counseling, confidentiality, how to convey a positive test result to the patient, and information about referral of a patient. Non-physician counselors at HIV testing sites in Texas are required to receive an intensive three-day course covering HIV-testing and counseling issues (Texas Department of Health, 1997). Younger physicians may receive such education in their residency experiences and practicing physicians may elect to take post-graduate courses. However, physicians are not required to take such training or to put course recommendations into practice. This variability means that not all physicians are well prepared to inform a woman of her HIV status and its implications for her pregnancy.

Overlooked when public health policies focus only on decreasing perinatal HIV transmission is the fact that some physicians are uncomfortable treating patients with HIV infection, because they fear a possible stigma in being identified as the "AIDS doctor" (Kellock & Rogstad, 1998; Peate, 1995). The abandonment of pregnant, newly identified HIV-positive women in this study by almost two-thirds of the prenatal providers underscores the problem. The rejection by their physicians occurred at a time when the women were dealing with the emotional issues of a new HIV diagnosis and its implications

for their pregnancies and the health of their babies. Women who are HIV-positive typically do not incur prenatal problems that differ significantly from problems of other pregnant women. The ACTG 076 protocol is straightforward and widely available from the Centers for Disease Control and Prevention, health departments, professional associations, and medical textbooks and journals (CDC, 1994b; Working Group on Antiretroviral Therapy, 1998; Parpart, Peery & Sawin, 1999). Strategies must be developed, perhaps through local medical societies or by offering financial incentives, to increase physician skill in diagnosing HIV and providing competent, quality care for women living with HIV disease. It may be less important that every physician know the latest medical treatment protocols for pregnant HIV-infected women, than for them to understand how to test and counsel women, compassionately present a positive test result, and refer to providers who are familiar with the latest approaches to treatment.

The end result of expanded HIV testing has been the clear reduction of new infections among children (CDC, 1997a). However, the cost has been significant emotional damage to women who have been poorly counseled, stigmatized, and dismissed from care. Listening to the words of women in this and other studies provides a clear perspective of what needs to be done (Mawn, 1998). Simply stated, women said, *"They need to teach doctors how to give HIV results to people"* and *"My doctor needs to go to school and learn a little more about HIV."* Emphasis must be given to educating physicians and other health care providers on how to present bad news about emotional topics such as HIV, and how to appropriately refer patients to available community resources for services they cannot provide.

REFERENCES

American Pediatrics Academy-American College of Obstetricians and Gynecologists (1995). *Joint Statement on Human Immunodeficiency Virus Screening.* Washington, DC: The American College of Obstetricians and Gynecologists.

Centers for Disease Control and Prevention (1994a). *HIV Counseling, Testing and Referral: Standards and Guidelines.* Atlanta, GA: United States Department of Health and Human Services, Public Health Service.

Centers for Disease Control and Prevention (1994b). Recommendations of the United States Public Health Service Task Force on the use of zidovudine to reduce perinatal transmission of human immunodeficiency virus. *Morbidity and Mortality Weekly Report,* 43(RR-11), 1-20.

Centers for Disease Control and Prevention (1995). 1995 United States Public Health Service recommendations for human immunodeficiency virus counseling and voluntary testing for pregnant women. *Morbidity and Mortality Weekly Report,* 43(RR-7), 1-15.

Centers for Disease Control and Prevention (1997a). Update: Perinatally acquired HIV/AIDS-United States. *Journal of the American Medical Association,* 278, 2135-2136.

Centers for Disease Control and Prevention (1997b). Availability of report of NIH panel to define principles of therapy of HIV infection and guidelines for the use of antiretroviral agents in HIV-infected adults. *Federal Register,* 62(118), 33417.

Centers for Disease Control and Prevention (1999). United States HIV and AIDS cases reported through December 1997.

HIV/AIDS Surveillance Report, 9, 2.

Connor E., Sperling, R., Gelber, R., Kiselev, P., Scott, G., O'Sullivan, M., VanDyke, R., Bey, M., Shearer, W., Jacobson, R., Jimenez, E., O'Neill, E., Bazin, B., Delfraissy, J. F., Culnane, M., Coombs, R., Elkins, M., Moye, J., Stratton, P., & Balsley, J. (1994). Reduction of maternal-infant transmission of human immuno-deficiency virus type 1 with zidovudine treatment. *New England Journal of Medicine,* 331(18), 1173-1180.

D'Angelo, L., Belzer, M., Futterman, D., & Peralta, L. (2000). Response to the joint statement on HIV screening. *Pediatrics,* 105, 467-468.

Davis S., Gwinn, M., Wasser, S., Fleming, P., & Karon, J. (1993). HIV prevalence among United States childbearing women, 1989-1992. First National Conference on Human Retroviruses and Related Infections, Washington, D.C., December, 1993, p. 60.95921064.

Fiscus S., Adimora, A., Schoenbach, V., Lim, W., McKinney, R., Rupar, D., et al. (1996). Perinatal HIV infection and the effect of zidovudine therapy on transmission in rural and urban counties. *Journal of the American Medical Association, 275,* 1483-1488.

International Perinatal HIV Group (1999).

Kaplan, J. E., Masur, H., Holmes, K. K., & members of the USPHS/IDSA Prevention of Opportunistic Infections Working Group (1999). Antiretroviral therapy and medical management of pediatric HIV infection *Pediatrics,* 102(4), 1005-1062.

Kellock, D. & Rogstad, K. (1998). Attitudes to HIV testing in general practice. *International Journal of STD & AIDS,* 9, 263-267.

Lallemant, M., Jourdain, G., Le Coeur, S., Kim, S., Koetsawang, S., Comeau, A. M.,

Phoolcharoen, W., Essex, M., McIntosh, K., & Vithayasai, V. (2000). A trial of shortened zidovudine regimens to preventmother-to-child transmission of human immunodeficiency virus type 1. Perinatal HIV Prevention Trial (Thailand) Investigators. *New England Journal of Medicine,* 343(14), 982-981.

Mandelbrot, L., Le Chenadec, J., Berrebi, A., Bongain, A., Bénifla, J. F., Delfraissy, J. F., Blanche, S., & Mayaux, M. J. (1998). Perinatal HIV-1 transmission: interaction between zidovudine prophylaxis and mode of delivery in the French perinatal cohort. *Journal of the American Medical Association,* 280(1), 55-60.

Matheson, P., Abrams, E., Thomas, P., Hernan, M., Thea, D., Lambert, G., et al. (1995). Efficacy of antenatal zidovudine in reducing perinatal transmission of HIV transmission. *Journal of Infectious Diseases,* 172, 353-358.

Mawn, B. (1998). Integrating women's perspectives on prenatal human immunodeficiency virus screening: toward a socially just policy. *Research in Nursing and Health,* 21, 499-509.

Nakchbandi, I., Longnecker, J., Ricksecker, M., Latta, R., Healton, C. & Smith, D. (1998). A decision analysis of mandatory compared with voluntary HIV testing in pregnant women. *Annals of Internal Medicine,* 129, 760-767.

Parpart, C., Peery, M. & Sawin, K. (1999). Immune system disorders: HIV/AIDS, mononucleosis, and allergic responses. In (Youngkin, E., Sawin, K., Kissinger, J. & Israel, D., Eds.) *Pharmacotherapeutics: A Primary Care Clinical Guide* (pp. 897-922). Stamford, CT: Appleton-Lange.

Peate, I. (1995). A question of prejudices: Stigma, homosexuality and HIV/AIDS. *Professional Nurse,* 10, 380-383.

Perinatal HIV Guidelines Working Group Members (2001). Public health service task force recommendations for use on antiretroviral drugs in pregnant HIV-1-infected women for maternal health and interventions to reduce perinatal HIV-1 transmission in the United States. [On-line]. Available: http://www.hivatis.org/guidelines/perinatal/May03_01/PerinatalMay04_01.pdf.

Simpson, B., Shapiro, E. & Andiman, W. (1997). Reduction in the risk of vertical transmission of HIV-1 associated treatment of pregnant women with orally administered zidovudine alone. *Journal of the Acquired Immune Deficiency Syndrome & Human Retroviral Infections*, 14, 145-152.

State of Texas Health and Safety Code §§ 81.090 (1995).

Texas Department of Health (1997). *HIV Prevention Counseling & Partner Elicitation Pre-Course*. Austin, TX: TDH HIV/STD Training & Public Education Branch.

Wade, N. A., Birkhead, G. S., Warren, B. L., Charbonneau, T. T., French, P. T., Wang, L., Baum, J. B., Tesoriero, J. M., Robert Savicki, R. (1998). Abbreviated regimens of zidovudine prophylaxis and perinatal transmission of the Human Immunodeficiency Virus. *New England Journal of Medicine*, 339(20), 1409-1414.

Wasser, S., Gwinn, M. & Fleming, P. (1993). Urban-nonurban distribution of HIV infection in childbearing women in the United States. *Journal of the Acquired Immunodeficiency Syndrome*, 6, 1035-1042.

Wortley, P., Lindegren, M. & Fleming, P. (1998). Prevention of perinatal transmission in the United States: a population-based evaluation of prevention efforts in four states. 12th International Conference on AIDS, Geneva, Abstract Number 23282.

HEALTH-RELATED LIFESTYLE BEHAVIORS
OF RURAL HEALTH CARE PROVIDERS

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■ BRIEF REPORTS

ABSTRACT

The purposes of this study were to: 1) describe lifestyle behaviors of rural health care providers, and 2) examine relationships among select demographic variables and lifestyle behaviors of the providers using a descriptive, correlational design. One hundred and thirty-two health care providers from six rural areas were recruited while attending continuing education programs. Each subject completed a demographic sheet and a 148-item Health-Promoting Lifestyle Profile (HPLP), which had six subscales and an overall profile. Only four of the HPLP items were practiced by a majority of subjects either often or routinely. Eleven significant correlations were found among the sample demographic variables and the lifestyle behaviors. Four statistically high correlations were identified among lifestyle behaviors and the total lifestyle profile. Although several statistically significant correlations were found, mean scores for each subscale indicated that the subjects practiced health-related lifestyle behaviors only sometimes, but not often or routinely.

Key words: healthy behaviors, health promotion, lifestyle behaviors, lifestyle choices, rural health care providers, rural populations. (Texas Journal of Rural Health 2001; 19(3): 52-60)

INTRODUCTION

Every day people make numerous lifestyle choices. The more healthy the lifestyle choices that people make, the more positive the quality of life. Research has shown that a person's lifestyle choices impact his or her well being and length of life. The health needs of people tomorrow are also determined by lifestyle choices of yesterday and today (Lai & Cohen, 1999; O'Quinn, 1995). According to the United States Department of Health and Human Services (2000), *Healthy People 2010* is about improving the health of the individual, community, and nation with a goal of increased quality and years of healthy living. Not all lifestyle behaviors are healthy lifestyle choices and these unhealthy lifestyle choices contribute to 50% of the untimely deaths in the United States. The person's well being during the later years of life is also negatively impacted by poor health-related behaviors (United States Department of Health and Human Services, 1995).

Health care providers with their educational preparation and backgrounds would be expected to practice healthy lifestyle behaviors. When the providers make healthy lifestyle choices, they serve as role to their clients and also influence others with whom they interact to make healthy lifestyle choices. The rural setting creates different opportunities for the rural health care providers than the urban setting does for the urban health care providers. In rural areas, the health care providers are confronted with a lack of anonymity and much greater role diffusion than urban providers (Weinert & Burman, 1994). With these challenges, rural health care providers remain in an excellent position to have an impact on the lifestyle behaviors and habits of others (Dellasega, Brown, & White, 1995).

In 1990, between 30 and 40 million United States residents (30% of the female population) lived in rural areas (Bushy, 1993). In 1990, 62 million people lived in counties considered to be rural with populations of less than 2,500 people (Weinert & Burman, 1994). People living in rural areas often have less access to health clubs, social services, and public transportation than persons in urban areas. Different obligations, such as harvesting a crop, may also lead to different health-related lifestyle choices and different lifestyle behaviors (Dellasega, Brown, & White, 1995). Health may be perceived in rural areas as the ability to work (Lee, 1993). Therefore, the research problem was: What are the lifestyle behaviors that rural health care providers practice and model within the rural setting?

RESEARCH LITERATURE

Lifestyle Patterns and Behaviors in the United States

A 1997 survey by the American Dietetic Association found that 79% of Americans believe that nutrition impacts health, but only 40% have a healthful eating plan; 81% believe exercise and physical activity are important, but only 43% make an effort to get regular physical activity (United States Department of Health and Human Services, 1995). Patterson, Haines, and Popkin (1994) in a study involving diet and exercise found 10% of United States population had an overall healthy lifestyle, 25% had a good diet, but sedentary activity level, and 18% had a fair diet with high activity level.

Health-Promoting Lifestyle Profiles in Various Populations

Using the Health-Promoting Lifestyle Profile (HPLP), Fowler (1996) examined the lifestyle behaviors of persons with Parkinson's Disease. The sample was 42 patients ranging in age from 44 to 86 years, (X=76). He found that subjects practiced interpersonal support behaviors the most frequently and exercise behaviors the least frequently.

Using the HPLP tool, O'Quinn (1995) found that university employees belonging to a university wellness program practiced more health-related lifestyle behaviors than those employees who did not belong; women practiced more health responsibility than men, and men practiced more self-actualization and exercise behaviors than women. Using the same tool, Lusk, Kerr, and Ronis (1995) found several strongly associated correlations; (1) white collar workers practiced more health-related lifestyle behaviors than blue collar workers; (2) younger workers had significantly higher scores on self-actualization, exercise, and interpersonal support than other workers; and (3) subjects with more education had higher scores on health responsibility, exercise, nutrition, and stress management.

Lifestyle Behaviors of Rural Populations

Three studies compared lifestyle behaviors of rural populations to urban populations. One comparison of lifestyle behaviors of urban and rural populations found that people living in rural settings slept seven hours or more per night, ate three meals a day, and avoided excessive consumption of alcohol more often than persons living in urban settings (Johnson, Ratner, & Bottorff, 1995). Speake, Cowart, and Stephens (1991) used the HPLP tool to examine healthy lifestyle practices as related to education, income,

locus of control, and perception of health. Of the 343 volunteer elderly subjects, 106 lived in rural settings and 237 lived in an urban setting. Although perceived health status and locus of control were independently predictive of two or more of the HPLP behaviors, the place of residence was not predictive of lifestyle practices when income and education were controlled. Duelberg (1992) examined lifestyle behaviors of 19,027 women (16.2% black and 83.8% white) living in urban and rural areas. She found that residence had a positive effect on the practice of secondary prevention behaviors such as having pap tests or breast self-exams. The availability of health care services may explain the difference. Women living in urban areas were not significantly different from women living in rural areas with regard to of exercise behaviors, smoking/non-smoking, and maintaining favorable weight.

A study examining cholesterol-related health behaviors in 116 rural elderly persons found that subjects were concerned about nutritional well being and had cholesterol screenings. However, the subjects had limited knowledge about the role of exercise and good food sources to lower cholesterol values (Dellasega, Brown, & White, 1995). In examining the personal health practices of couples residing in the rural area, Holcomb (1992) found that rural couples had higher frequencies of snacking, which may have led to the prevalence of overweight people in the sample.

METHODS

Framework

The Health Promotion Model (HPM) developed by Pender (1987) served as a basis for the development of the HPLP tool and as the theoretical framework for this study.

Pender (1987) defines health promotion as activities directed toward increasing the level of well being and actualizing the health potential of individuals, families, communities, and society. The HPM has seven cognitive-perceptual factors and five modifying factors, which impact an individual's participation in health-promoting behaviors. Using one of Pender's cognitive factors, definition of health, this study examined one of Pender's modifying factors, demographic characteristics. Modifying factors are examined to identify an individual's likelihood of engaging in health promoting behaviors. Pender's model has been tested previously in numerous studies (Pender, Walker, Sechrist, & Frank-Stromborg, 1990; Lusk, Kerr, & Ronis; 1995).

The Study Design

A descriptive, correlational, research design was used in this study. Select demographic characteristics (i.e., age, gender, education, marital status, number of hospitalizations within the past year, and number of times exercised per week) were investigated as were the lifestyle behaviors described in the HPLP. Correlations among the demographic characteristics and the lifestyle behaviors were examined.

Data Collection Instruments

Two data collection instruments were used in the study. A one-page demographic sheet provided the information relative to the demographic variables. A two-page psychometric instrument, the HPLP, with six subscales and a total profile scale was the second tool used for data collection. The HPLP tool was a 48-item instrument on personal habits relative to daily living. The tool focused on enhancement of well being rather than illness prevention. Subjects

were asked to identify how often each behavior was performed. Item responses were scored on a likert scale with numeric values ranging from one (never); two (sometimes); three (often); to four (routinely). Possible scores for the total scale value ranged from 48 to 192. Scores for each of the six subscales differed according to the number of items on each subscale. Subscale categories included: self-actualization (13 items related to sense of purpose), health responsibility (10 items related to seeking health care), exercise (5 items related to plan of exercise), nutrition (6 items related to awareness of dietary patterns), interpersonal support (7 items related to intimacy and ongoing close relationships), and stress management (7 items related to identifying and relieving stress and achieving relaxation). Means were computed for the total score and each of the subscales. The higher the total score, the greater the use of health behaviors and the healthier the lifestyle. Higher scores on an individual subscale indicated healthier lifestyle choices in that particular lifestyle area (Walker, Sechrist, & Pender, 1987). Reliability and validity for the tool were documented in numerous previous studies with alpha reliabilities ranging from 0.919 to 0.93 (Pender et al., 1990; Lusk et al., 1995; O'Quinn, 1995). In the study sample, the HPLP total scale coefficient alpha was 0.8561 and the subscale values ranged from 0.7784 to 0.8900. Validity for the tool was established in previous studies (Walker et al., 1987; Pender et al., 1990; O'Quinn, 1995) through factor analysis, review by experts in the area of health-promoting lifestyle behaviors, and a review of the literature.

Setting and Sample

The study was conducted in a state in the southwestern portion of the United States. Health care providers from six small hospitals

that were located in a rural community were asked to participate in the study while they were attending a continuing education program given in their place of employment. Approval to conduct the study was obtained through the Institutional Review Board of the university providing the continuing education programs. Data were collected over a five-month period of time as continuing education programs were presented in the six rural hospital settings. Employment as a health care provider in a rural setting was the only criteria for participation in the study. Those who volunteered to participate were asked to complete two data collection instruments. Completion of the demographic sheet and lifestyle profile denoted consent to partici-pate. Subjects who agreed to participate were informed that all responses would be confi-dential and completion of the two tools served as consent.

One hundred and thirty-two health care providers from the six rural areas agreed to participate. The median size of the six groups was 21 with 10 health care providers in the smallest group and 35 health care providers in the largest group. Subjects ranged in age from 20 to 70 years of age with a mean age of 40.6. Thirteen males (10%) and 119 females (90%) employed in various health care roles ranging from nursing aids to registered nurses completed the tools. Ninety percent of the subjects were Caucasian (n = 119), 73% were married (n = 96), and approximately 42% (n = 56) were registered nurses. All of the subjects had completed high school and 22 had at least some graduate education. Forty-seven percent of the sample (n = 62) had two-year or four-year degrees.

Because employees may use sick days for reasons other than an illness, subjects were asked the number of times hospitalized during the past year rather than the number of sick days used. Over 80% of the subjects (n=109) were not hospitalized and only two were hospitalized more than twice. No additional information was gathered about the hospital-ization so whether or not the hospitalization was related to unhealthy lifestyle choices could not be determined.

RESULTS

The data were analyzed as a whole (n = 132) rather than analyzed by rural settings because of the small numbers in some of the groups. As a result, differences or likenesses among the different settings were not studied. See Table 1 in response to the first research question: What are the lifestyle behaviors of health care providers in six rural areas?

The mean scores for the total profile and the subscales indicate that subjects practiced self-actualization and interpersonal lifestyle behaviors often, but all other behaviors sometimes or less. Item means ranged from 2.4 to 3.1 with an overall subscale mean of 2.67 suggesting that subjects practiced lifestyle behaviors only sometimes. Only four of the 48 items on the tool were identified as being practiced by a majority of the subjects. Eighty subjects routinely believed that life has purpose (60%); 75 subjects often set realistic goals (57%); 73 subjects often expressed feelings (55%); and 70 subjects often were aware of strengths and weaknesses (53%). The item relating to expression of feelings was one of the seven stress management items. The other three items were related to self-actualization behaviors (n=13). None of the items relating to nutrition, exercise, health responsibility, or interpersonal support were practiced either routinely or often by 50% or more of the subjects.

The second research question asked: What are the relationships between the demographic variables and the lifestyle behaviors of rural health care providers? Statistically significant moderately strong

correlations were found between age and several lifestyle behaviors. Correlations relative to age were: (1) age & nutrition, (2) age & stress management, and (3) age & health responsibility. The older the health care provider, the more often these categories of lifestyle behaviors were practiced. These findings differed from Lusk et al. (1995) who found that younger workers had significantly higher scores on self-actualization, exercise, and interpersonal support than other workers.

Weaker, but statistically significant correlations, were found between (1) education and interpersonal support, (2) gender and interpersonal support, (3) gender and exercise, (4) marital status and interpersonal support, and (5) the number of times hospitalized and health responsibility (see Table 2). Persons with more education, married people, and women practiced interpersonal support behaviors more than those with less formal education, single people, and men. As would be expected, people who were hospitalized were also more apt to be practicing health responsible behaviors such as physician visits. Some of these correlations differed from Lusk et al. (1995) who found that the greater the education, the higher the scores on health responsibility, exercise, nutrition, and stress management. Although no significant correlation was found between gender and health responsibility, a newspaper report (Poirot, 1999) stated that women visit doctors 30% more than men. Using the HPLP tool, O'Quinn (1995) found that women practiced health responsibility behaviors more frequently than men.

CONCLUSION

Overall, the study findings show that a majority of the rural health care providers studied practice only four of the 48 health-related lifestyle behaviors identified on the tool on a regular basis and three of these behaviors are self-actualization behaviors. Because self-actualization behaviors may not be as easy to identify as other lifestyle behaviors, the health care providers as role models could be indirectly communicating to the consumer the lack of importance of practicing healthy lifestyle behaviors. If consumers observe health care providers not practicing healthy lifestyle behaviors, they may also not practice healthy lifestyle behaviors. This could lead to a less healthy society and increase the need for health care among rural residents. Additional research to assess lifestyle behaviors of various health

Table 1. Descriptive Statistics for HPLP Scale/Subscales

Instrument	Mean	Range
Self-Actualization (13 items)	40.256	27 (25 to 52)
Health Responsibility (10 items)	25.139	25 (13 to 38)
Exercise (5 items)	10.788	15 (5 to 20)
Nutrition (6 items)	16.188	16 (8 to 24)
Interpersonal Support (7 items)	22.298	24 (12 to 36)
Stress Management (7 items)	18.024	20 (8 to 28)
Total Life Profile (48 items)	133.950	88 (92 to 180)

Table 2. Correlations of Demographic Variables and HPLP Scale/Subscales

	Health Responsibility	Interpersonal Support	Exercise
Age	0.2589	-0.0624	-0.0976
	p= 0.004	p= 0.493	p= 0.281
Education	0.1313	0.1840	0.0121
	p= 0.149	p= 0.041	p= 0.893
Ethnicity	-0.0280	-0.2230	0.0101
	p= 0.764	p= 0.015	p= 0.912
Exercise per Week	0.0615	-0.0624	0.6465
	p=0.517	p=0.507	p=0.000
Gender	0.1378	0.1924	-0.2117
	p= 0.130	p= 0.032	p= 0.017
Marital Status	0.0578	0.2059	-0.1082
	p= 0.529	p= 0.022	p= 0.230
Occupation	0.1298	-0.0024	0.1686
	p=0.158	p=0.979	p=0.061
Time in Hospital	0.1996	0.0991	-0.0458
	p= 0.028	p= 0.275	p= 0.612

	Nutrition	Self-Actualization	Stress Management	Total Lifestyle Profile
Age	0.3722	0.0072	0.2769	0.1089
	p= 0.000	p= 0.938	p= 0.002	p= 0.281
Education	0.0560	0.0773	0.0416	0.1479
	p= 0.530	p= 0.399	p= 0.645	p= 0.140
Ethnicity	-0.1361	-0.1823	-0.1129	-0.1882
	p= 0.133	p= 0.051	p= 0.219	p= 0.065
Exercise per Week	0.2052	0.0070	0.0839	0.1118
	p=0.025	p=0.942	p=0.368	p=0.284
Gender	0.1394	0.0696	0.1257	0.1228
	p= 0.116	p= 0.448	p= 0.162	p= 0.221
Marital Status	0.1544	0.0849	0.0477	0.0298
	p=0.083	p= 0.356	p= 0.599	p= 0.768
Occupation	-0.0110	-0.0499	0.0518	0.0545
	p=0.903	p=0.590	p=0.569	p=0.592
Time in Hospital	0.0773	-0.0337	-0.0221	0.0858
	p= 0.388	p= 0.715	p= 0.807	p= 0.393

(Coefficient / Cases / Two-tailed Significance)

care providers in a variety of settings could provide support for all health care providers to examine their own lifestyle behaviors and how they are impacting their consumers. Examining lifestyle behaviors of urban health care providers would provide an interesting comparison to determine if they are different than rural health care providers.

REFERENCES

Bushy, A. (1993). Rural women: Lifestyle and health status. *Nursing Clinics of North America*, 28(1), 187-107.

Dellasega, C., Brown, R., & White, A. (1995). Cholesterol-related health behaviors in rural elderly persons. *Journal of Gerontological Nursing*, 21(5), 6-12.

Duelberg, S. I. (1992). Preventive health behavior among black and white women in urban and rural areas. *Social Science in Medicine*, 34(2), 191-198.

Fowler, S. B. (1996). Hope and a health-promoting lifestyle in persons with Parkinson's disease. *Journal of Neuroscience Nursing*, 29(2), 111-116.

Holcomb, C. A. (1992). Personal health practices of couples in rural Kansas. *Health Values*, 16(6), 36-46

Johnson, J. L., Ratner, P. A., & Bottorff, J. L. (1995). Urban-rural differences in the health promoting behaviors of Albertans. *Canadian Journal of Public Health*, 86(2), 103-8.

Lai, S. C. & Cohen, M. N.(1999). Promoting lifestyle changes. *American Journal of Nursing*, 99(4), 63-67.

Lee, H. J. (1993). Health perceptions of middle, Anew middle, and older rural adults. *Community Health*, 16(1), 19-27.

Lusk, S. L., Kerr, M. J. & Ronis, D. L., (1995). Health-promoting lifestyles of blue-collar, skilled trade, and white-collar workers. *Nursing Research*, 44(1), 20-24.

Quinn, J. L. (1995). Worksite wellness programs and lifestyle behaviors. *Journal of Holistic Nursing*, 13(4), 346-360.

Patterson, R. E., Haines, P. S., & Popkin, B. M. (1994), Health lifestyle patterns of U.S. adults. *Preventative Medicine*, 23(4), 453-60.

Pender, N. J. (1987). *Health promotion in nursing practice* (2nd ed.). Norwalk, CT: Appleton & Lange.

Pender, N. J., Walker, S. N., Sechrist, K. R., & Frank-Stromborg, M. (1990). Predicting health promoting lifestyles in the workplace. *Nursing Research*, 39, 326-332.

Poirot, C. (June 20, 1999). The gender health gap, *Fort Worth Star-Telegram*, 1G.

Speake, D. L., Cowart, M. E., & Stephens, R. (1991). Healthy lifestyle practices of rural and urban elderly. *Health Values*, 15(1), 45-51

United States Department of Health and Human Services (1995). *Healthy people 2000: National health promotion and disease prevention*. (Public Health Services Publication No. 91-50212) Washington, DC: United States Government Printing Office.

United States Department of Health and Human Services (2000). *Healthy People 2010* (Public Health Services Publication No. 017-001-00547-9). Washington, DC: United States Government Printing Office.

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health promoting lifestyle profile: Development and psychometric characteristics. *Nursing Research*, 35(2), 76-81.

Weinert, C., & Burman, M. E. (1994). Rural health and health-seeking behaviors, *Annual Review of Nursing Research,* 12, 65-92.

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