

2011

# Musculoskeletal Healthcare for Latino Migrant Farmworkers: Interprofessional Collaboration to Provide Service and Educate Future Health Care Providers

Jason Brumitt

*George Fox University*, [jbrumitt@georgefox.edu](mailto:jbrumitt@georgefox.edu)

Leda Garside

Rebecca Reisch

Talina Marshall

Hu En Gilpin

*See next page for additional authors*

Follow this and additional works at: [http://digitalcommons.georgefox.edu/pt\\_fac](http://digitalcommons.georgefox.edu/pt_fac)

 Part of the [Physical Therapy Commons](#)

---

## Recommended Citation

Published in *Journal of Sport Rehabilitation*, 2011; 20(4): 494-504.

This Article is brought to you for free and open access by the School of Physical Therapy at Digital Commons @ George Fox University. It has been accepted for inclusion in Faculty Publications - School of Physical Therapy by an authorized administrator of Digital Commons @ George Fox University. For more information, please contact [arolfe@georgefox.edu](mailto:arolfe@georgefox.edu).

---

**Authors**

Jason Brumitt, Leda Garside, Rebecca Reisch, Talina Marshall, Hu En Gilpin, Jessica Kinsey, and Kelsey Imondi

# Musculoskeletal Healthcare for Latino Migrant Farmworkers: Interprofessional Collaboration to Provide Service and Educate Future Health Care Providers

**Jason Brumitt** MSPT, SCS, ATC, CSCS *School of Physical Therapy, Pacific University*

**Leda I. Garside** RN, BSN, MBA *Tuality Healthcare*

**Rebecca A. Reisch** PT, DPT, OCS *School of Physical Therapy, Pacific University*

**Talina Marshall** BS, SPT, LMT *School of Physical Therapy, Pacific University*

**Hui En Gilpin** DPT, MS, CSCS *Woodburn Therapy Group*

**Jessica Kinsey** DPT *Children's Intensive Therapy NW*

**Kelsey Imondi** SPT *School of Physical Therapy, Pacific University*

## Abstract

The inability to access health care services is a significant issue in the United States (US). The US Census Bureau reports that as of 2009 over 50 million individuals (16.7% of the population) lacked health insurance. The number of people who became uninsured has also increased over time. One segment of the US population that is particularly vulnerable to health care inequities is Latinos.

Failure to access timely primary medical services may increase the risk of disease transmission, morbidity, and mortality. In addition, failing to address health care needs at the primary provider level may contribute to an overutilization of potentially unnecessary emergency room services. To address health care disparities and inequalities, community partners must collaborate to provide the needed services.

This report will describe the collaboration between community health nurses and physical therapists when providing services to address the musculoskeletal health of the workers. In addition, this report will describe the service and experiential opportunities for physical therapy students including the opportunity to provide care within an interprofessional setting, practice techniques and provide service in a unique environment, and to develop aspects of professionalism.

## Introduction

The inability to access health care services is a significant issue in the United States (US). The US Census Bureau reports that as of 2009 over 50 million individuals (16.7% of the population) lacked health insurance (Denavas-Walt, Proctor, & Smith, 2010). This was a 2.5 million increase in uninsured individuals from the previous year (Denavas-Walt, Proctor, & Smith, 2010).

One segment of the US population that is particularly vulnerable to health care inequities is Latinos (Shah & Carrasquillo, 2006). The Latino population (described by the US Census Bureau as “persons of Hispanic or Latino origin”) is the largest ethnic minority in the US accounting for nearly 16% of the US population (Denavas-Walt, Proctor, & Smith, 2010; Shah & Carrasquillo, 2006). When compared with other races and/or ethnic groups in the US, Latinos are the most likely to be uninsured with 32% of all Latinos lacking health insurance (Denavas-Walt, Proctor, & Smith, 2010; Farquhar et al., 2008; Hoerster, Beddawi, Peddecord, & Ayala, 2010; Mueller, Patil, & Boilesen, 1998; National Center for Farmworker Health, 2011; Shah & Carrasquillo, 2006). A subset of the Latino population that is particularly vulnerable to health care disparities is undocumented immigrants (Hoerster et al., 2010; Shah & Carrasquillo, 2006). While it is difficult to ascertain exact numbers of individuals who would be classified as “undocumented,” the US Census reports 46% of all non-citizen immigrants lack health insurance (Denavas-Walt, Proctor, & Smith, 2010).

Individuals who lack health insurance are less likely to seek medical services from primary providers and/or will be more likely to present to an emergency room for their medical care (Carr, 2006; Flores & Deal, 2003; Mariger et al., 2009; National Center for Farmworker Health, n.d.a). Undocumented immigrants may not seek medical care fearing that if their immigration status is identified they will be deported (Bustamante, Fang, Rizzo, & Ortega, 2009; Marshall, Urrutia-Rojas, Soto Mas, & Coggin, 2005). From a public health perspective, the inability to access timely primary medical services may increase the risk of disease transmission, morbidity, and mortality (Kullgren, 2003). In addition, failing to address health care needs at the primary provider level may contribute to an overutilization of potentially unnecessary emergency room services (Kullgren, 2003; Palinkas & Arciniega, 1999).

Health care providers are challenged to develop and implement alternative means to deliver services to those who are underserved or uninsured. Collaborations between health care providers may help address disparities within their local communities (Kelly & Miller, 2008; Knauss et al., 2003). Furthermore, faculty members from university health care programs who partner with public health providers may be able to volunteer needed care for at-risk populations while also creating opportunities for community service and unique learning opportunities for their students.

### Purpose

The purpose of this report is to describe a unique, interprofessional health care program for an at-risk population (Latino migrant farmworkers) that lacks both health insurance and access to health care providers. Community health nurses in northwest Oregon collaborate with university health care providers and other health care groups to perform health screens, provide treatments, and when necessary refer migrant workers to other medical providers. This report will describe the collaboration between the community health nurses and physical therapists when providing health care services to address the musculoskeletal health of the workers. In addition, this report will describe the service and experiential opportunities for physical therapy students including the opportunity to provide care within an interprofessional setting, practice techniques and provide treatment in a unique environment, and develop aspects of professionalism (Knauss et al., 2003; Mayne & Glascoff, 2002; Sternas, O’Hare, Lehman, & Milligan, 1999).

### Access to Health Care in Oregon for Latino Farmworkers

Latinos account for 11% of Oregon’s population with forecasts expecting upwards of 40% growth through 2020 (Oregon Commission on Hispanic Affairs, 2010; US Census Bureau, 2011). Educational attainment is low with a vast majority of Latinos (25 years and older) either lacking a high school diploma (46.3%) or attaining a high school diploma as their highest level of education (24%) (Oregon Commission on Hispanic Affairs, 2010; Denavas-Walt, Proctor, & Smith, 2010). Over

one-third (37%) of Latinos in Oregon are foreign born and are not US citizens (Oregon Commission on Hispanic Affairs, 2010). Factors such as these may impact employment opportunities for these segments of the Latino population.

One industry that does not require post high-school training for many of its positions is agriculture and farming. Agriculture and farming is a major industry in the state of Oregon, with Latinos representing the majority of all individuals involved in this occupation (National Center for Farmworker Health, n.d.a; Bureau of Labor Statistics, 2011). Oregon farms rely on the estimated 100,000 migrant and seasonal workers; however a majority (approximately 77%) of these workers are employed in only seasonal positions (Filsinger, 2004).

Migrant and seasonal farmworkers workers risk exposure to pesticides, musculoskeletal injury, and death in an industry that is considered to be one of the most hazardous occupations in the United States (Kato et al., 2006; Mariger et al., 2009; McCauley, 2005; McCauley et al., 2006; Filsinger, 2004; Zuskin, Mustajbegovic, Schachter, Kern, & Pavicic, 1997). The physical demands associated with this line of work require long hours of performing repetitive tasks, often at fast speeds (Meyers et al., 2001). Meyers et al. (2005) reported 29 musculoskeletal disorders (MSD) in a population of 194 vineyard workers over a 2 ½ year period. Over 400 work days were lost due to the MSDs in this population (Meyers et al., 2005). A majority of all MSDs occurred in the back (69%) with the remaining MSDs experienced equally amongst the neck/shoulder, hand/arm, and the lower extremities (Meyers et al., 2005). Brumitt et al. (2011) reported similar findings in a population of Latino migrant/seasonal vineyard workers. Forty-five percent of all males and 75% of all females described experiencing musculoskeletal symptoms (MSS) in one or more regions of their body (Brumitt et al., 2011). The workers reported the back (thoracic and lumbar spine) as the primary region where they experienced MSS (Brumitt et al., 2011). Of the 115 males that reported MSS, 82 (71.3% of all males with MSS complaints or 32% of the entire male sample population) were experiencing MSS in the back (Brumitt et al., 2011). Twenty-four of 32 female workers reported MSS with 14 female workers (58.8% of all females with MSS complaints or 43.7% of the entire female sample population) were experiencing MSS in the back (Brumitt et al., 2011).

Despite the aforementioned risks associated with agricultural work, migrant farmworkers generally lack access to health care services (over two-thirds of all farm workers lack health insurance) (Carr, 2006; Farquhar et al., 2008; Hoerster et al., 2010; McCauley, 2005; McCauley et al., 2006; National Center for Farmworker Health, n.d.b; Sherrill et al., 2005; Zuskin et al., 1997). If a migrant farmworker becomes sick or injured, he or she may face several barriers to accessing health care (Bustamante et al., 2009; Hoerster et al., 2010; Kullgren, 2003; Marshall et al., 2005; McCauley, 2005). For those who lack health insurance, the out-of-pocket costs are prohibitive (Denavas-Walt, Proctor, & Smith, 2010). Culture may also delay one from seeking necessary medical intervention. In some cases, Latinos (who may or may not have health insurance) may prefer to self-treat rather than to utilize formal medical care (Brumitt et al., 2011; Sherrill et al., 2005). Self-treatment poses risks to the individual if he/she fails to recognize the severity of the injury/disease and/or if one consumes medications improperly. Latinos who elect to seek medical care may encounter a lack of available services (e.g. rural settings, lack of interpreter services) and/or may have difficulty negotiating the American health care system due to an inability to fluently speak English (Graham & Jacobs, 2008; Farquhar et al., 2008; Sherrill et al., 2005).

### The ¡Salud! Program and Interprofessional Collaboration

To address the health care needs of some migrant vineyard workers in Oregon, winemakers in the Willamette Valley (northwest Oregon) and physicians in Washington County (Oregon) created the ¡Salud! program (¡Salud!, 2011). For nearly two decades the ¡Salud! program has increased health care access for migrant workers and their families (¡Salud!, n.d.).

Health care providers from the ¡Salud! team (Tuality Health care, Hillsboro, Oregon), and assisted by community partners and volunteer health care professionals from Pacific University (Hillsboro, Oregon) provide on-site health screening clinics each year at vineyards during the spring and summer months. Services provided at these clinics include health care screening (cholesterol, diabetes, blood pressure, height, weight, and body mass index), nurse practitioner examinations (University of Portland), vaccinations, musculoskeletal examinations (performed by Pacific University faculty and student physical therapists), optometric examinations (Pacific

University), dental health services (Pacific University), mental health services, and health education (Brumitt et al., 2011; Reynolds, 2009).

Vineyard workers are encouraged to participate with clinics scheduled during regular working hours. At the start of each clinic, workers complete the ¡Salud! health intake form and the ¡Salud! medical ID card paperwork. The ¡Salud! medical ID card increases one's ability to access local medical care with services provided at a reduced rate. Once the paperwork is completed, workers present to each specialty (e.g. public health nursing, physical therapy, dental health, etc.) for assessment. At the end of each clinic, members of the ¡Salud! program conduct an interactive educational session on a spectrum of topics (e.g. personal health, mental health, nutrition, and stretching techniques).

### Musculoskeletal Health Care: Prevention, Assessment, Treatment, and Education

Physical therapists and graduate students in the physical therapy program perform musculoskeletal examinations and functional fitness screening assessments, provide treatment (e.g. stretching, relaxation, and manual therapy) if needed, review/educate workers on proper body mechanics, and prescribe therapeutic exercise when indicated (Brumitt et al., 2011).

The delivery of orthopedic physical therapy services at the onsite clinics differs from delivery of care within a traditional clinical setting. First, the delivery of care is performed at the vineyard and at some locations the care is provided outside. Second, the ability to provide treatments or prescribe exercises is limited to the equipment and modalities that can be transported (e.g. treatment table, elastic bands, aspects of the workers' environments). Third, the worker who accesses physical therapy services is also unique when compared to the traditional physical therapy patient. In this case, the worker is not an established patient (one who has seen a provider and received a medical diagnosis) and, unlike some patients, is continuing to work requiring his/her body to perform at a high level despite experiencing MSS. It is the responsibility of the physical therapy team to evaluate the worker, screening him/her for any non-musculoskeletal pain mimickers and establishing a physical therapy diagnosis. Table 1 (following page) presents examples of 4 individuals who have presented to the physical therapy team with MSS. This table is not intended to identify all

aspects of a client's musculoskeletal examination or the treatments provided, but rather to present brief case examples encountered by the physical therapy team.

The interaction between the physical therapy team and the community nursing staff at these interprofessional clinics help to facilitate referral of a worker to an appropriate health care provider when necessary. There have been cases in which a worker has reported symptoms to the physical therapy team that had not been reported to the nursing team. The immediate referral back to the nursing team has allowed the worker to receive immediate assessment by the nursing staff and/or receive a referral to a physician. The physical therapy team has also identified workers, based on reported symptoms and examination findings that would benefit from assessment by an orthopedic physician. The community health nurses facilitate the referral to the appropriate physician, helping the worker negotiate the health care system. In addition to individuals who have been referred to primary providers, there have been individuals who were referred to physical therapy for additional treatments to address chronic conditions.

During the 2009 and 2010 clinics, the physical therapy team has provided musculoskeletal examinations, fitness assessments, manual therapy, therapeutic exercise, and education to nearly 600 migrant workers. In addition, community-based research has been conducted to improve how health care is delivered to this population (Brumitt et al., 2011; Reynolds, 2009).

### Educational Opportunities for Future Health Care Providers

Educating physical therapy students involves a combination of didactic coursework and clinical instruction (American Physical Therapy Association, 2004). There is a growing recognition by physical therapy educators of the necessity of additional academic and experiential learning opportunities to develop professionalism and foster interprofessional understanding and collaboration (Kelly & Miller, 2008; Reynolds, 2005). The majority of a student's interaction with patients and opportunities for interprofessional collaboration occur during clinical internships (Reynolds, 2009; Reynolds, 2005). Clinical internships provide the opportunity for academic and professional growth; however, there are limitations as to the total number of clinical competency opportunities (Reynolds, 2005). Reynolds (2005)

**Table 1**

*Sample Cases of MSS Reported by Migrant Vineyard Workers and the Intervention(s) Performed by the Physical Therapy Team*

Sample Client	Sample Findings	Treatments Performed and/or Referral Generated
Male, 24 (y) with left knee pain	Symmetrical hip and knee active range of motion, asymmetrical hip strength (R > L), pain with palpation to left anterior knee	Prescription of therapeutic exercise for the hip and knee
Female, 26 (y) with back pain	Decrease core muscular endurance, decreased thoracic and lumbar joint mobility	Thoracic and lumbar mobilizations and manipulations, prescription of exercises to increase core muscular endurance, body mechanics (lifting) education
Male, 44 (y) with right shoulder pain	Postural deficits, decreased shoulder strength (rotator cuff), positive impingement tests	Prescription of therapeutic exercises to address rotator cuff weakness, stretching exercises to improve postural deficits, communicating with ¡Salud! regarding follow up care with orthopedic surgeon
Male, 65 (y) with bilateral knee pain	Pain with functional lower extremity tests, creptius (bilateral knees)	Referral to orthopedic surgeon

review of students' post-clinical assessment paperwork (Physical Therapist Clinical Performance Instrument) found that the traditional clinical setting did not allow for the following opportunities: "consultation; prevention and wellness; addressing needs for services other than physical therapy; and social responsibility" (Reynolds, 2005). Physical therapy academic programs have added both coursework and service learning opportunities to address lacking curricular components (Kelly & Miller, 2008). First-year physical therapy students at Pacific University participate in an interprofessional competence course with other first-year health professions students. This course helps to improve interprofessional relationships; however, the experiential component may not involve service to a minority group and it does not include direct patient care (Purden, 2005).

this community service (the program occurs during the summer months when students are on break) gain opportunities to practice skills providing care in an interprofessional environment, develop communication skills with other medical professionals (Table 2, following page), practice speaking Spanish, participate in public health research, and experience professional growth that cannot be reproduced in the classroom (Brumitt et al., 2011; Chupp & Joseph, 2010; Purden, 2005; Reynolds, 2009). Table 3 (following pages) presents the physical therapy experiential benefits associated with this community service experience. Categories in the first column (from the American Physical Therapy Association's (2004) A Normative Model of Physical Therapist Professional Education) are presented to identify practice opportunities for the student.

Physical therapy students who choose to volunteer for

**Table 2***Interprofessional Skill Development for Physical Therapy Students Participating in ¡Salud!*

Collaborating Professional	Topic	Student Experience
Community Nurse	Identification of symptoms and/or signs during worker's musculoskeletal assessment not previously reported to community nurse	Reporting findings to community nurse; discuss differential diagnosis possibilities; report potential benefits associated with physical therapy treatment
	Public health	Student gains first-hand exposure for the needed health care services by those who are underserved or uninsured
Health Educators	Health topics (nutrition, sexual behavior, mental health, stretching, etc) are presented in an interactive session at the end of each clinic	Students are exposed to health concerns of this population; physical therapy students participate by leading instruction on stretching performance
University Health Care Teams (Optometry, Dental Health)	Various topics	Discussion with graduate school peers regarding services they provide; observation of their practice

**Discussion**

This case report details the benefits associated with interprofessional collaboration between organizations to deliver health care services to an underserved and/or uninsured population. Migrant workers, students, and health care providers benefit from interprofessional collaboration.

To the best of our knowledge, the ¡Salud! program is unique in its scope and delivery of service. This model, supported by monies raised by the vineyards and volunteer service from university faculty and students, helps to provide care for those who would be otherwise unable to afford basic services. The delivery of care via the mobile clinics brings the health care professionals to the worker, eliminating the challenges associated with negotiating the US medical system.

Despite the awareness that the Latino migrant farmworker is at risk for injury and generally lacks access to appropriate medical care, there is much to be learned

about improving the delivery of care. Preliminary evidence suggests workers are at risk for MSS or MSD (Brummitt et al., 2011; Meyers et al., 2001). Future research should prospectively assess benefits associated with pre-season injury prevention interventions, identify risk factors associated with injury, and assess MSS and MSD in workers after the harvest.

Currently, aside from the interprofessional course, physical therapy student participation in community service (e.g. ¡Salud!) is on a voluntary basis. As such, assessment of student learning has been limited to qualitative reports. Students have reported improved confidence performing musculoskeletal examinations and joint manipulation techniques. In addition, students have gained awareness of inequities in health care access. Hopefully, awareness of health care inequities will impact future clinicians to provide pro-bono services to underserved populations. A few former students of the program have volunteered time following graduation.

A goal of the physical therapy program is to evolve this

**Table 3***Physical Therapy Related Experiential Benefits for Students who Participated in ¡Salud! Clinics*

Normative Model Domain (APTA, 2004)	Experiential Learning Opportunity Building on Classroom Instruction	Student Skill Development
<b>Professional Practice Expectation</b>		
Altruism & Professional Duty	Providing pro-bono service to underserved or uninsured populations	Volunteering time outside of required coursework
Communication	Practice communicating with patients	Spanish (medical) language communication Communicating with patient via interpreter
Culture Competence	Appreciate socioeconomic factors associated with populations access to health care	Observe and discuss with workers job requirements
<b>Patient/Client Management Expectations</b>		
Examination	Practice musculoskeletal examination skills under the supervision of academic faculty	Develop clinical reasoning; practice components of musculoskeletal examination
Diagnosis	Review examination findings to identify potential diagnosis(-es) and to rule out non-musculoskeletal origins of pain	Develop clinical reasoning; refer client to another medical/health care provider
Intervention	Provide immediate treatment, prescribe therapeutic exercise, provide education	Immediate treatment Joint mobilization/manipulation Soft tissue mobilization Therapeutic exercise prescription Education Use of hot/cold Body mechanics Group instruction: Stretching
<b>Practice Management Expectations</b>		
Prevention/Health Promotion	Identify poor body mechanics (e.g. lifting)	Group education: proper body mechanics at work

community service into a formal service learning experience. Structuring the service learning experience will include measurable learning objectives and require student reflection (e.g. HPSISN Service-learning – Student Survey, reflective writing on cultural competence) (Reynolds, 2009; Shinnamon, Gelmon, & Holland, 1999; Wong & Blissett, 2007).

## Conclusion

The collaboration between community health nurses and a university physical therapy team has benefitted migrant workers, student physical therapists, and has facilitated research. Migrant workers are now receiving musculoskeletal services that may either reduce risk of injury (education, body mechanics, flexibility programs) or improve symptoms associated with a MSS or MSD (manual therapy, therapeutic exercise prescription). Students benefit from additional opportunities to practice while supervised by university faculty. Collaborations between physical therapists and community health nurses have facilitated research in a population that has been underserved. Additional investigations are necessary to improve the delivery of care for this population and the experiential transformation associated with student volunteerism.

## References

American Physical Therapy Association. (2004). *A normative model of physical therapist professional education: Version 2004*. Alexandria, VA: American Physical Therapy Association.

Brumitt, J., Reisch, R., Krasnoselsky, K., Welch, A., Rutt, R., Gar-side, L. I., & McKay, C. (2011). Self-reported musculoskeletal pain in Latino vineyard workers. *Journal of Agromedicine*, 16, 72-80.

Bustamante, A. V., Fang, H., Rizzo, J. A., & Ortega, A. N. (2009). Understanding observed and unobserved health care access and utilization disparities among U.S. Latino adults. *Medical Care Research and Review*, 66, 561-577.

Carr, D. D. (2006). Implications for case management. Ensuring access and delivery of quality health care to undocumented immigrant populations. *Lippincotts Case Management*, 11, 195-204.

Chupp, M. G. & Joseph, M. L. (2010). Getting the most out of service learning: maximizing student, university and community impact. *Journal of Community Practice*, 18(2&3), 190-212.

DeNavas-Walt, C., Proctor, B.D. & Smith, J.C. (2010). *Income, poverty, and health insurance coverage in the United States: 2009* (U.S.

Census Bureau, Current Population Reports, P60-238). Washington, D.C.: U.S. Government Printing Office. Retrieved from <http://www.census.gov/prod/2010pubs/p60-238.pdf>

Farquhar, S., Samples, J., Ventura, S., Davis, S., Abernathy, M., McCauley, L., Cuilwik, N., & Shadbeh, N. (2008). Promoting the occupational health of indigenous farmworkers. *Journal of Immigrant and Minority Health*, 10, 269-280.

Filsinger, C. (2004, May). *Background brief on farmworker labor*. Oregon Employment Department. Retrieved from [http://www.leg.state.or.us/comm/commsrvs/background\\_briefs2004/Economy,%20Business%20and%20Labor/CD\\_Farmworker\\_Labor2004.pdf](http://www.leg.state.or.us/comm/commsrvs/background_briefs2004/Economy,%20Business%20and%20Labor/CD_Farmworker_Labor2004.pdf)

Flores, L. Y. & Deal, J. Z. (2003). Work-related pain in Mexican American custodial workers. *Hispanic Journal of Behavioral Sciences*, 25, 254-270.

Graham, E. A. & Jacobs, T. A. (2008). Health services utilization by low-income limited English proficient adults. *Journal of Immigrant and Minority Health*, 10, 207-217.

Hoerster, K., Beddawi, S., Peddecord, K. M., & Ayala, G. X. (2010). Health care use among California farmworkers: predisposing and enabling factors. *Journal of Immigrant and Minority Health*, 12, 506-512.

Kato, A. E., Fathallah, F. A., Miles, J. A., Meyers, J. M., Faucett, J., Janowitz, I., & Garcia, E. G. (2006). Ergonomic evaluation of winegrape trellis systems pruning operation. *Journal of Agricultural Safety and Health*, 12, 17-28.

Kelly, S. P. & Miller, E. W. (2008). Education for service: development of a service learning course. *Journal of Physical Therapy Education*, 22, 33-42.

Knauss, L. K., Kramer, L. G., Linn, M. I., Silver, P. T., Soliman, H. H., & Wellmon R. H. (2003). Preparing students in human service professions for interdisciplinary practice. *Human Service Education*, 23, 87-97.

Kullgren, J. T. (2003). Restrictions on undocumented immigrants' access to health services: the public health implications of welfare reform. *American Journal of Public Health*, 93, 1630-1633.

Mariger, S. C., Grisso, R. D., Perumpral, J. V., Sorenson, A. W., Christensen, N. K., & Miller, R. L. (2009). Virginia agricultural health and safety survey. *Journal of Agricultural Safety and Health*, 15, 37-47.

Marshall, K. J., Urrutia-Rojas, X., Soto Mas, F., & Coggin, C. (2005). Health status and access to health care of documented and undocumented immigrant Latino women. *Health Care for Women International*, 26, 916-936.

Mayne, L. & Glascoff, M. (2002). Service learning: preparing a health care workforce for the next century. *Nurse Educator*, 27, 191-194.

McCauley, L. A. (2005). Immigrant workers in the United States: recent trends, vulnerable populations, and challenges for occupational health. *AAOHN Journal*, 53, 313-319.

McCauley, L. A., Anger, W. K., Keifer, M., Langley, R., Robson, M. G., & Rohlman, D. (2006). Studying health outcomes in farm-worker populations exposed to pesticides. *Environmental Health Perspectives*, 114, 953-960.

Meyers, J. M., Miles, J. A., Faucett, J., Janowitz, I., Tejada, D. G., Weber, E., Smith, R., & Garcia, L. (2001). Priority risk factors for back injury in agricultural field work: vineyard ergonomics. *Journal of Agromedicine*, 9, 37-52.

Mueller, K.J., Patil, K., Boilesen, E. (1998). The role of uninsurance and race in health care utilization by rural minorities. *Health Services Research*, 33(3 Pt 1), 597-610.

National Center for Farmworker Health. (n.d.a). *Facts about farmworkers*. Retrieved from <http://www.ncfh.org/docs/fs-Facts%20about%20Farmworkers.pdf>

National Center for Farmworker Health. (n.d.b). *Occupational health and safety*. Retrieved from <http://www.ncfh.org/docs/fs-OCC%20Health.pdf>

Oregon Commission on Hispanic Affairs. (2010, February 15). *2009 Annual Report*. Retrieved from [http://www.oregon.gov/Hispanic/pdfs/OCHA\\_annual\\_report2009.pdf](http://www.oregon.gov/Hispanic/pdfs/OCHA_annual_report2009.pdf)

Palinkas, L. A. & Arciniega, J. I. (1999). Immigration reform and the health of Latino immigrants in California. *Journal of Immigrant Health*, 1, 19-30.

Purden, M. (2005). Cultural considerations in interprofessional education and practice. *Journal of Interprofessional Care*, Suppl1, 224-234.

Reynolds, P. (2009). Community engagement: what's the difference between service learning, community service, and community-based research? *Journal of Physical Therapy Education*, 23, 3-9.

Reynolds, P. J. (2005). How service-learning experiences benefit physical therapist students' professional development: a grounded theory study. *Journal of Physical Therapy Education*, 19, 41-54.

¡Salud!. (n.d). *¡Salud! mission*. Retrieved from <http://www.saludauction.org/services/mission-and-services/>

Shah, N. S. & Carrasquillo, O. (2006). Twelve-year trends in health insurance coverage among Latinos, by subgroup and immigration status. *Health Affairs*, 25, 1612-1619.

Sherrill, W., Crew, L., Mayo, R. M., Mayo, W. F., Rogers, B. L. & Haynes, D. F. (2005). Educational and health services innovation to improve care for rural Hispanic communities in the USA. *Rural and Remote Health*, 5, 1-11.

Shinnamon, A. F., Gelmon, S. B. & Holland, B. A. (1999). Methods and Strategies for Assessing Service-learning in the Health

Professions. San Francisco: Community Campus Partnerships for Health.

Sternas, K.A., O'Hare, P., Lehman, K. & Milligan, R. (1999). Nursing and medical student teaming for service learning in partnership with the community: an emerging holistic model for interdisciplinary education and practice. *Holistic Nursing Practice*, 13, 66-77.

US Census Bureau. (2011, June 3). *Oregon quickfacts*. Retrieved from <http://quickfacts.census.gov/qfd/states/41000.html>

Bureau of Labor Statistics, United States Department of Labor. (2011, May 27). *Foreign-born workers: labor force characteristics – 2010*. Retrieved from <http://www.bls.gov/news.release/pdf/forbrn.pdf>

Wong, C. K. & Blissett, S. (2007). Assessing performance in the area of cultural competence: an analysis of reflective writing. *Journal of Physical Therapy Education*, 21, 40-47.

Zuskin, E., Mustajbegovic, J., Schachter, E. N., Kern, J., & Pavicic, D. (1997). Respiratory function in vineyard and orchard workers. *American Journal of Industrial Medicine*, 31, 250-255.

## Corresponding Author

Jason Brumitt MSPT, SCS, ATC, CSCS  
Assistant Professor

School of Physical Therapy  
Pacific University  
222 SE 8th Avenue  
Hillsboro, OR 97123

[brum4084@pacificu.edu](mailto:brum4084@pacificu.edu)