

## Retrospective analysis of language-related cultural disparity trends in acute rehabilitation: Implications for health communication

### Análisis retrospectivo de las tendencias en las desigualdades relacionadas con el idioma y la cultura en la rehabilitación aguda: Implicaciones para la comunicación en salud

Cheryl J. Hickey<sup>1</sup>, Helda Pinzón-Pérez<sup>2</sup>

#### Resumen

**Objective:** The purpose of this study was to examine retrospective data to determine if disparities existed in physical therapy outcomes for acute rehabilitation patients.

**Materials and Methods:** Patients from different ethnic/language groups were compared and disparities were measured by comparing Functional Independent Measures® (FIM) scores.

**Results:** Records of three thousand one hundred and ninety-seven patients admitted to a large acute rehabilitation center in the United States over a six year period were analyzed. Of the 23 language groups represented, the largest three language groups, English, Spanish, and South East (SE) Asian (Hmong, Khmer, Laotian, and Cambodian) languages were analyzed with a total of 2,253 subjects. It was found that the three groups were not significantly different, in terms of their length of stay in the rehabilitation setting ( $F=2.30$ ,  $p=.101$ ), age ( $F=2.52$ ,  $p=.081$ ), or number of comorbidities ( $F=2.93$ ,  $p=.054$ ). However, admission FIM® ( $F=54.94$ ,  $p<.001$ ), projected FIM® goal ( $F=56.67$ ,  $p<.001$ ) and discharge FIM® ( $F=44.81$ ,  $p<.001$ ) were all significantly different, with the non-English speakers scoring lower at all three rating points by therapists.

**Conclusions:** The results of this study demonstrate the importance of the effect of cultural and linguistic barriers on health communication interactions. In addition, this study provides insights to international health professionals on the issues of cross-cultural variations in the presentation of language barriers and their impact on potential research outcomes.

**Key words:** Language barriers, physical therapy, health communication.

<sup>1</sup> P.T., M.P.T., M.S., Ed.D. Assistant Professor, Department of Physical Therapy, California State University, Fresno. cherylba@csufresno.edu

<sup>2</sup> PH.D., RN, MPH, MCHES Professor and Graduate Director, Department of Public Health, California State University, Fresno. hpinzonp@csufresno.edu

**Correspondence:** Cheryl J. Hickey, California State University, Fresno.

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### Abstract

**Objetivo:** El propósito de este estudio fue el examinar retrospectivamente los datos para determinar si las disparidades existen en los resultados de la Fisioterapia para pacientes en rehabilitación aguda.

**Materiales y Métodos:** Se hizo una comparación entre los pacientes de diferentes grupos étnicos o lingüísticos y las disparidades se midieron a través de un test conocido como Functional Independent Measures® (FIM).

**Resultados:** En este estudio fueron analizados los registros de tres mil ciento noventa y siete pacientes admitidos a un centro de rehabilitación en los Estados Unidos en un periodo de seis años. De los veintitres grupos lingüísticos representados, los grupos más grandes y que se tomaron para el análisis fueron el Inglés, el Español y las lenguas del Sureste Asiático (Hmong, Khmer, Laotian, y Cambodian) con un total de 2.253 sujetos. Se encontró que los tres grupos no tenían diferencias estadísticas significativas en términos de la duración de su estadia en el centro de rehabilitación ( $F=2.30, p=.101$ ), edad ( $F=2.52, p=.081$ ), o número de co-enfermedades ( $F=2.93, p=.054$ ). Sin embargo el test FIM® de admisión ( $F=54.94, p<.001$ ), el FIM® proyectado ( $F=56.67, p<.001$ ) y el test FIM® de salida ( $F=44.81, p<.001$ ) reportaron diferencias significativas, siendo los de habla Inglesa los que tuvieron puntajes más bajos en los tres puntos de medición de los terapistas.

**Conclusiones:** Los resultados de este estudio demuestran la importancia de las barreras culturales y lingüísticas que afectan las interacciones de la comunicación en salud. Además, este estudio provee áreas de reflexión para los profesionales en salud internacional sobre las variaciones interculturales en las barreras lingüísticas y su efecto en los resultados de los estudios.

**Palabras Clave:** Barreras lingüísticas, Fisioterapia, comunicación en salud.

## INTRODUCTION

Literature that examines health disparities within allied health fields, particularly in the field of physical therapy, is not well developed. Within just the past decade, however, the overall trend towards examining health disparities has gained momentum in both medicine and allied health fields. For example, in looking at the professional literature, Alder found in 1980 one article from a key word search “health disparities”, whereas for the period 2000 to 2004 hundreds of articles could be found with the same key word search (1). This literature shows consistent patterns of disparities across diagnoses such as hip fracture/joint replacement, stroke, and traumatic brain injury. In addition, current literature demonstrates that these disparities can be classified

as 1) racial/ethnic group differences, 2) socioeconomic differences and 3) gender differences (2-15).

Several specific examples illustrate these racial/ethnic and gender differences, as is the case, for example, with total knee replacement surgeries (2). Moreover, in several studies, the effect of socioeconomic and access factors (commonly examined together as contributing factors) were controlled because the groups studied were part of the Veteran’s Administration System, where access and cost were held equivalent for ethnic groups (2). Beyond rates of surgeries, other disparities in treatment were also found. It has been established that following hip fractures, ethnic minorities have been discharged home to self-care rather than a skilled-level of care at much higher rates,

compared to non-minorities (3). In a separate study examining physical and occupational therapy services across multiple states, an ethnicity effect was noted in relationship to whether patients received any physical and occupational therapy post-hip fracture. Even when patients were referred to therapy, the intensity of the therapy provided varied depending on the patients' ethnicity, with minorities tending to receive a lower intensity intervention compared to non-minorities (4).

According to a 2008 NIH research publication, outcomes for post-acute rehabilitation following stroke in the United States showed that non-Hispanic Caucasian patients had higher admission and discharge functional status ratings compared to minority groups of patients, and that non-Hispanic Caucasian patients were discharged home for care less often than African American, Hispanic patients, or other minority patient groups (5). Another study also indicated that non-Hispanic Caucasian patients achieved higher functional measure scores compared to African American patients and were less likely to be discharged home. This second study did not indicate that Asian patients had lower discharge scores compared to non-Hispanic Caucasian patients, but the Asian patients had lower functional scores at the three-month follow-up, after discharge from rehabilitation settings (6). In addition, there were noted differences both for gender and ethnicity with regards to stroke discharge destinations. African American patients, women, older individuals, the uninsured and those with lower incomes were more likely to receive skilled nursing facility care, instead of specialized acute inpatient rehabilitation (7).

For patients with traumatic brain injury, it has been shown that although Hispanic patients had similar discharge functional measures as non-Hispanic Caucasian patients, at one year post-discharge they had lower functional outcomes compared to non-Hispanic Caucasian patients. It was also found that Hispanic patients were of lower socioeconomic status than the non-Hispanic Caucasian patients (8). An additional study noted that ethnicity and payment status accounted for a portion of the discharge status variance. However, in this case, ethnicity and payment status accounted for a lower percentage (5%) of the post-acute hospital discharge status variance as compared to length of stay (35%) and Glasgow Coma Scale scores (44%) (9).

With regards to these disparities, it is important to note that communication/language barriers are a critical sub-issue of both the racial/ethnic and socioeconomic groupings, and that the literature on language barriers shows a rich and confounding secondary source that underpins health disparities. For example, a national sample of insured individuals indicated that ethnic disparities in preventative and other types of care were largely explained by differences in English fluency (10). In particular, the acute rehabilitation setting is a place where many patients are very vulnerable when it comes to communication issues. Research has documented that it is critical that therapists in rehabilitation settings become better at cross-cultural communication (11). In addition, researchers note that in order to accomplish this, therapists need the ability to recognize elements that will impact communication, including clients who, 1) have a communication disorder, 2) are not fluent in the language that the provider

speaks, and 3) may speak the same language as the practitioner, but do not match the practitioner's communication competence. Communication competence may be due, in part, to ethnic or cultural backgrounds and/or socioeconomic experience, as well as formal education (11). Most physical therapists are well versed in recognizing and working with communication disorders that many of their neurologically impaired patients manifest following injury or disease. However, the latter two communication issues (different language or mismatched communication competence) may not be circumstances in which therapists are well-prepared to treat patients effectively (11).

Health disparities have been clearly documented in the literature although understanding of disparities is not complete. Many disparities studies have examined differences in non-Hispanic Caucasians compared to African American and Hispanic patients. Studies examining Asian patients, and particularly subgroups of Asian patients, are very limited. For example, literature including Asian patients and male-female comparisons for specific measures of physical therapy outcomes is not available. The purpose of this study, therefore, was to examine a large, retrospectively collected data set to determine if disparities existed in physical therapy services in acute rehabilitation. The comparison of interest was between ethnic groups with language barriers and native speakers of English. Functional Independence Measures (FIM)<sup>®</sup> scores were used to measure physical therapy outcomes. «The FIM<sup>®</sup> assessments are used clinically to monitor the outcomes of rehabilitative care as required by the Joint Commission on the Accreditation of Health Care Organizations (JCAHO) and the Commission on

the Accreditation of Rehabilitative Facilities (CARF). According to VHA [Veteran's Hospital Administration] Directive 2000-16, medical centers are mandated to measure and track rehabilitation outcomes on all new stroke, lower-extremity amputees, and traumatic brain injury (TBI) patients using the FIM<sup>®</sup>.»(16) The FIM<sup>®</sup> is an 18 item assessment composed of 13 motor tasks (for example ambulation and grooming) and 5 cognitive tasks (Social interaction and problems solving) that consider basic activities of daily living. This assessment utilizes a seven point ordinal scale that measures patient's functional level from complete dependence to complete independence. A score of seven indicates complete independence.

## MATERIALS AND METHODS

**Subjects:** The accessible population for this study was 3,197 patients admitted to a California Central Valley hospital's rehabilitation center during the period of December 2002 to June 2008. This rehabilitation center serves a very diverse patient population in the heart of the Central Valley and its surrounding areas. The patients seen at this facility are extremely culturally diverse and reflective of the Valley's population as a whole. Approximately 90 different ethnic/language groups are represented in the Valley's population and about 50% are Hispanic. This hospital is classified as a non-profit, tax-supported hospital and it serves low-income patients.

The subject exclusion criteria included any medical chart that indicated death prior to discharge from rehabilitation, where complete Functional Independence Measures (FIM)<sup>®</sup> scores, pertinent comorbidities, demographic,

or admission information could not be collected, or if the chart failed to document ethnicity, primary language or translator use. Thus subject inclusion criteria included any patient admitted to the center for rehabilitation, where complete FIM® scores, pertinent comorbidities, demographic and primary language and translator use could be documented. Twenty-two patients were excluded because of inability to document primary language, verification of translator use, co-morbidities, demographic data or incomplete FIM® scores. The final sample size was 3,175. The study underwent IRB review and approval at California State University, Fresno prior to data collection.

**Procedures:** Data were gathered from subject charts. Each was evaluated for inclusion and coded void of patient name but with use of ID numbers by one of the hospital's Medical Data System (MDS) experts over an eight month period. The collected data were saved into an Excel spreadsheet, and included initial FIM® scores, the therapists' goal FIM® scores (in this case where the therapist projects the patient will end at the time of discharge) and the patients' FIM® scores at discharge. In addition, comorbidities, insurance, age, gender, ethnicity, primary language, translator use, and length of stay were also retrieved from the charts and entered. Twenty-three language groups were represented in this sample of patients.

After initial review of the collected data, two additional exclusion criteria were developed: age fifty or older and a member of one of the three largest language groups. The rationale for the age cut-off was that these were the subjects who had most likely designated a primary language other than English, and this age group likely represented first generation immigrants. Subjects were further selected based on the three

largest language groups: English, Spanish, and SE Asian languages (Hmong, Khmer, Laotian, and Cambodian). While subjects using other languages were of interest, the small number of cases for speakers of the twenty other languages limited their utility in the current study.

Subjects from the three main language groups who were aged fifty or older made up the final sample of 2,253. There were 1,912 (85%) English speakers, 266 (12%) Spanish speakers, and 75 (3%) speakers of SE Asian languages. All patients resided in the Central Valley of California, a culturally and linguistically diverse region with a predominantly rural, agriculturally-based economy. This region has a very large population of SE Asian refugee groups.

## RESULTS

Regarding the reported need for interpreters by the PT, Table 1 shows the percentage of patients who required some method of interpretation to work with the medical staff. A few cases in the Spanish and SE Asian language groups had missing data on this variable, accounting for the percentages below 100%. However, all these patients had indicated that English was not their primary language in hospital records. Five English speaking patients indicated the use of a translator and since they indicated English was their primary language, it may be the presence of sign-language interpreters for the deaf or hard-of-hearing, interpreting spoken English. Hospital records did not indicate variations in type of translators used.

In addition to the descriptive data provided in Table 1, tests of significance by language groups on key variables typically related

to patient outcomes are reported in Table 2. There were no significant differences among the three language groups on age at admission, number of comorbidities at admission, or days of treatment in rehabilitation. Despite the similarities of the three groups, significant differences were noted on physical therapists' initial evaluation FIM® scores, goal FIM® scores, and discharge FIM® scores (Tables 3, 4, and 5). The overall ANOVA Fs and the post-hoc Tukey HSD multiple comparisons showed that all three groups were significantly different from each other on admission FIM® scores, goal FIM® scores, and FIM® scores at discharge. The physical therapists' initial assessments, expectations, and outcomes were lower for the non-English speakers despite their similarities in age, comorbidities, and the fact that all groups received equivalent treatment duration. Spanish speakers were significantly lower than English speakers on all three measures, and SE Asian speakers were in turn significantly lower than Spanish speakers and English speakers.

An additional research question focused on how well each group achieved its goal FIM® by comparing the goal to the discharge status. For all three groups, the discharge FIM® was somewhat lower than the goal FIM® (Table 6). For the SE Asian group, however, this difference was lower by more than twice the English and Spanish groups. The difference among the groups was statistically significant on the overall ANOVA, and Tukey post-hoc comparisons indicated that the SE Asian group was significantly lower than the English group and the Spanish group. The English and Spanish speakers were not significantly different. Thus, the SE Asian group, which had the lowest FIM® scores at admission, as a goal, and as an

outcome, also had the largest disparity between their low expected outcomes and their actual outcomes compared to the other two language groups.

**Table 1.** Percentage of subjects and frequency requiring an interpreter

Language Groups	Percent of Patients Needing Interpreters	Number of Patients Needing Interpreters
	(%)	(n)
English	0.3	6
Spanish	96.4	256
SE Asian	98.7	74

Source: Source:tabulated by authors

**Table 2.** Mean ages, comorbidities, and days in rehabilitation of the three largest language groups

	English	Spanish	SE Asian	ANOVA Result
Mean Ages at Admission (SD)	68.78	67.16	69.20	F=2.52, p=.081
	(11.36)	(10.19)	(12.24)	
Mean Comorbidities at Admission (SD)	5.20	4.87	4.76	F=2.93, p=.054
	(2.51)	(2.40)	(2.38)	
Mean Days in Rehabilitation (SD)	12.64	13.72	12.81	F=2.30, p=.101
	(7.77)	(7.73)	(5.17)	

Source: Source:tabulated by authors

**Table 3.** Initial FIM® scores at admission by language group

Language Group	Mean Admission FIM®	Std Dev	Results
English	66.50	16.01	F=54.94, p<.001
Spanish	58.80	17.74	
SE Asian	51.09	16.93	

Source: Source:tabulated by authors

**Table 4.** Goal FIM® scores by language group

Language Group	Mean Goal FIM® Score	Std Dev	Results
English	90.87	15.16	F=56.67, p<.001
Spanish	83.54	17.05	
SE Asian	75.87	16.19	

Source: Source:tabulated by authors

**Table 5.** Discharge FIM® scores by language group

Language Group	Mean Discharge FIM® Score	Std Dev	Results
English	87.72	19.32	F=44.81, p<.001
Spanish	79.61	21.35	
SE Asian	70.47	20.95	

Source: Source:tabulated by authors

**Table 6.** Mean differences between goal FIM® scores and discharge FIM®

Language Group	Mean Difference Goal and Discharge	Std Dev	Results
English	-2.10	10.18	F=3.61, p=.027
Spanish	-1.78	9.99	
SE Asian	-4.92	9.69	

scores by language group.

Source: Source:tabulated by authors

## DISCUSSION

Communication between patients and physical therapist in a rehabilitation setting is a key element of high quality care. Strong communication, which is vulnerable to language and cultural differences, may be even more critical in rehabilitation settings than in other medical settings. There are several reasons this may be true. First, patients in rehabilitation units often experience more profound or longer-term injuries or diseases, and that is the primary reason they have been placed in a rehabilitation setting. These patients require extended, specialized treatment for their injury or disease, and during this time they interact to a much higher degree with their therapists. In fact, therapists in these settings see their patients multiple times a day and on a daily basis. The therapists are required to get to know (personally), their patients, and in many cases, the families, in order to establish goals and assist the patient on how to best return to their previous level of function and life style. All of this requires that the therapist have a keen sense of the patient life style, home environment, practices, and beliefs.

It was hypothesized that first generation language minority patients (those 50 and above) would more likely be vulnerable to disparities in outcomes related to language barriers, and in fact, that is what was seen in this sample. Patients, particularly SE Asian patients, would have most likely immigrated as adults and therefore would not have been exposed to formal second language training and acculturation in the US educational system as would immigrants who came at younger ages and entered the school system. Because of their extreme language barriers they would be the group most

unlikely to develop extensive relationships during rehabilitation with their therapists, and it would be with these patients that therapists, who in this region are predominantly non-Hispanic Caucasians, would have the least cultural or language commonality. The idea of physical therapists not bonding as well with patients when there is a language barrier is supported by previous research (17). Furthermore, there is also no shortage of literature that shows the impacts that language barriers have on the overall quality of care and access to care for minority groups such as Hispanic patients (18-21). There is also not a lack of studies that focus on secondary access issues created by language barriers in Hispanic populations particularly when it comes to translator use, training and access (22-24). This research also highlights that having practicing therapists who are predominantly Caucasian, and mismatched to their patient population in terms of ethnicity, culture, and language, is a common theme in many parts of California including the Central Valley.(17) Furthermore, APTA demographics, like other allied health fields, indicate that the ethnicity of physical therapists continues to be mismatched to the general population nationally (25).

There is also a connection with language health barriers, disparities and social economic level. The connections between social economic level, acculturation and health outcomes may also be at play in the outcomes here as they have been suggested in past literature (26- 32).

This retrospective study considered several important patient variables in relationship to patients' primary language. While none of the background variables (age, comor-

bidities and treatment duration), differed among the language groups, there were significant differences among the three FIM® scores. These are consistent with another study which indicated higher rehabilitation outcomes for Caucasian (English speaking) patients compared to Hispanic patients. It is only partially consistent with a 2005 study which indicated that Caucasian subjects did not have initial discharge outcomes lower than Asian subjects, however, at a three month follow up, the Asian subjects did have lower outcomes compared the Caucasian subjects. In this 2005 study, however, it is unclear whether the Asian subjects encompass the SE Asian refugee group with first generation immigrant ages, and this would be an important consideration in comparing the two studies (33).

In the case of this study, the differences seen between the SE Asian languages speaking subjects and the Spanish speaking subjects may also be partially explained by language exposure and level of proficiency, which is related to immigration timing. The Hispanic population in the Valley and even within the state of California is more extensive and is more established than the SE Asian immigrants, whose mass immigration to the Central Valley occurred predominantly during the mid-1980s (34). It is much more likely that caregivers, health providers, and staff would know at least some Spanish. This happens because there is more societal exposure to Hispanic persons and culture overall, particularly within the Central Valley, compared to the SE Asian refugee groups.

Despite similar ages, comorbidities, and lengths of stay in rehabilitation, therapists rated patients with a language barrier lower

on initial evaluation, projected lower goals for them, and these patients achieved lower rehabilitation outcomes when compared to English-speaking patients. Although the present data do not support a cause and effect conclusion, the data suggest that when the importance of good communication between a physical therapist and his/her patient is considered, the language barrier appears to be critical. In fact, a previous study showed that language barriers did affect physical therapists' perceptions of treatment outcomes (17). The FIM® scores in this present study support that conclusion. In addition, a study of physicians concluded that three areas related to health disparities: evidence of less willingness of doctors to interact with members of minority groups; clinical uncertainty associated with doctors' differential interpretation of symptoms from minority patients; and stereotypes related to health behavior of minority patients (35). It is possible that some of these same dynamics are at work with physical therapists when they are assessing patients on the FIM®.

A confounding variable associated with the data in this study must be considered: California's mandatory translator law. Although the law was passed in 2003, insurance companies had until 2009 to fully comply with the law (36). It is difficult to say whether data similar to these data collected at the present time would be comparable because of the effect of increased compliance with the translator law. Moreover, it is unclear who, in many of these cases, served as translator for the patient and, if that, in fact, had an effect on the outcomes achieved in therapy. For instance even though the law is in place today, one study at Boston University Emergency Department indicated

that in many cases, even after the passing of a translator law there, translator use remained low, presumably because patients and therapists or other health professionals continue to rely and feel comfortable with family as their interpreters (37). Therefore, the timing of law implementation in this case and the question of who interpreted are considerations that would need to be addressed in future studies.

The findings of this study extend to this hospital and to this set of patients with language barriers; it is unknown if similar findings would extend to younger patients when there is still some type of language or cultural barrier. However, to that end, some literature suggests that language barrier are a concern for the pediatric population. Degree of language barrier in this case was considered to be critical, however that is not to say that patients who have even a moderate to minimal language barrier would still not be vulnerable to outcomes that are lower than patients who do not have a language barrier. While studies indicate a difference in outcomes between English-speaking patients and limited English-speaking patients, many of which are Spanish speaking, it is not well documented or established whether more subtle levels of language barrier create complications for patients nor how or if this holds consistent from changes in settings, for instance rehabilitation settings, emergency departments and outpatient care settings.

## CONCLUSION

This study posed various implications for health communication and international health. Health Communication is defined by the Centers for Disease Control and

Prevention [CDC] and the National Cancer Institute as “the study and use of communication strategies to inform and influence individual decisions that enhance health (38). In the area of Health Communication, this study showed that language and cultural differences may account for English speakers having significantly higher FIM® scores than both of the other non-English speaking groups. Although the three language groups in this study did not differ on age at admission, number of comorbidities, or treatment duration, their admission, goal, and discharge FIM® scores were significantly higher for English speakers compared to Spanish or SE Asian speakers. Furthermore, Spanish speakers were significantly higher on these three measures than were the SE Asian language speakers.

Communication is an area of development in health. The CDC (38) in the United States and the World Health Organization [WHO] (39) have made a call to health practitioners to develop their body of knowledge on health communication, both in the written and oral form, as a means to enhance their professional practice effectiveness. This study provides physical therapists and allied health professionals with an understanding of how linguistic and cultural elements influence treatment outcomes, not only in the United States but also around the world. The CDC suggests that health practitioners, including physical therapists, start by identifying the background information around the deficits in health communication with clients, set specific communication objectives in the interactions with clients, identify the specific target audience that is intended to be reached, select communication channels that are appropriate for the target audience, and conduct impact and outcome

evaluation of communication strategies being used. These recommendations are especially important in health communication interactions, particularly those that involve linguistic and cultural differences.

In the area of International Health, this study provided various elements of reflection for health professionals. First, it demonstrated that cultural and linguistic differences can account for results in research initiatives. As a result, it is important to use instruments that take into account these differences. Second, this study had conclusions that are applicable to geographical zones different from the United States. Migration is an international reality and as such, various countries around the globe deal with the impact of language barriers in health. Third, this study verifies the need for professionals to develop knowledge and skills in health communication. Bernhardt (40) describes effective communication as a core element in effective public health. According to this author, the field of health communication helps international health practitioners inform and motivate individuals to be healthy. Continued research is needed that examines the effect of language and cultural barriers on physical therapy outcomes and other health-related areas.

Studies also need to address language and cultural barriers in other treatment settings and other disciplines, such as occupational and speech therapy. Measures of ethnic background, as well as measures of cultural competency are needed to establish a multifactorial picture of the effects of language barriers on patients’ clinical outcomes such as the FIM® scores. In addition, the multifaceted understanding of the differences in cultural competency of physical therapists

and public health practitioners needs to be studied in detail.

Future studies should also look at economic indicators for treatment as factors being affected by language and communication issues. The importance of optimal health communication with the clients is of special relevance for the practice of physical therapy and public health.

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