

Measuring Job Characteristics and Mental Health Among Latino Farmworkers: Results from Cognitive Testing

Joseph G. Grzywacz · Toni Alterman · Carles Muntaner · Susan Gabbard · Jorge Nakamoto · Daniel J. Carroll

Published online: 9 August 2008
© Springer Science+Business Media, LLC 2008

Abstract *Background* Few research instruments used in occupational stress research have been evaluated for acceptability and validity among immigrant Latino farmworkers. *Methods* Cognitive testing was completed with 40 migrant and seasonal farmworkers (21 women, 19 men) through two focus groups and 16 one-on-one interviews conducted in Texas and Florida. Participants responded to the K-6, a short form instrument designed to measure psychological distress, selected items from the Job Content Questionnaire (JCQ) and standard health items. *Results* The K-6 items were characterized as too long and using a higher “class” language than farmworkers use. Further, the cultural connotation of several items in the K-6 was viewed as inappropriate by farmworkers. Demand items from the JCQ were interpreted inconsistently, whereas decision latitude items were consistently understood but viewed as irrelevant to farmworkers. *Conclusions* The results

highlight the difficulties involved in conducting research with immigrant farmworkers, and they suggest that researchers interested in studying antecedents and consequences of farmworker mental health need to select instruments cautiously.

Keywords Latino farmworkers · Mental health · Job characteristics · Psychosocial factors · Cognitive testing · Survey items · Qualitative

Introduction

Farmwork is among the most dangerous occupations [1]. Recent studies report that injury rates among immigrant farmworkers range from 6.0 to 12.5 per 100 fulltime equivalent employees [2, 3]. Apart from injury and physical illness, the mental health of farmworkers is of increased interest and concern. Evidence indicates, for example, that one in five migrant farmworkers has had an episode of one or more psychiatric disorders in their lifetime [4]. Other researchers report that 30–40% of farmworkers in the Midwest and east-coast migrant streams report clinically significant levels of depressive symptoms in the past 7 days [5–7]. High rates of poor mental health among farmworkers coupled with evidence suggesting that mental health contributes to injury on the job [8, 9] necessitate research on farmworker mental health.

Unfortunately, documenting farmworker mental health and the work-related factors that contribute to poor mental health is challenging. The unique demographic profile of farmworkers presents several measurement challenges. The National Agricultural Workers Survey (NAWS) reports that, in 2004–2006, 77% of farmworkers were foreign-born, mostly from Mexico, which raises questions about

J. G. Grzywacz (✉)
Department of Family and Community Medicine, Wake Forest University School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157-1084, USA
e-mail: grzywacz@wfubmc.edu

T. Alterman
Division of Surveillance, Hazard Evaluation and Field Studies, National Institute for Occupational Safety and Health, Cincinnati, OH, USA

C. Muntaner
Center for Addictions and Mental Health, Toronto, ON, Canada

S. Gabbard · J. Nakamoto
Aguirre Division, JBS International, Burlingame, CA, USA

D. J. Carroll
Department of Labor, Education and Training Administration, Washington, DC, USA

the cross-cultural equivalence of standard items used in surveillance research [10]. Moreover, variation in the Spanish spoken by farmworkers from different regions of Mexico, as well as regional and within-culture variation in the meaning of comparable Spanish terms presents linguistic barriers to conducting research with farmworkers and further complicates the issue of cross-cultural equivalence. Researchers need to ensure that the original meaning of concepts survives translation and that the translated concepts have comparable meaning in the target study population.

Exaggerating the challenge of cross-cultural equivalence is the fact that farmworkers have little formal education. Estimates from the most recent NAWS data indicate that the median and modal level of education among farmworkers is 6 years of education in Mexico. Lack of formal education leading to low reading levels among many farmworkers makes it difficult for them to participate in self-administered surveys. Further, low levels of formal education and corresponding inexperience responding to highly structured instruments (e.g., test-taking) and abstract thinking raise questions about farmworkers' ability to understand and respond to questions asked in interviewer-administered questionnaires. Difficulty with abstract concepts was clearly illustrated by Johnson and colleagues [10] who reported that Mexican-Americans had difficulty responding to the question "During the past week, how often have you felt that you could not shake off the blues, even with help from family or friends?" because the phrase "shake of the blues" had ambiguous cultural meaning. Johnson and colleagues further showed that difficulty understanding the item was associated with inflated frequency of endorsing the item.

Despite these and other significant measurement challenges in farmworker research, very little has been published that examines farmworkers ability to respond to items commonly used in survey-based surveillance research. The goal of this brief report is to assist researchers in selecting appropriate instruments for studying farmworker mental health and the work-related factors that may shape mental health outcomes. To accomplish this goal we report the results of cognitive tests of the "psychosocial elements of farmwork" module, a set of items being considered for inclusion as a supplement to the National Agricultural Workers Survey.

Methods

Cognitive testing is a technique that is now common-place in survey questionnaire development, particularly surveys used by government agencies such as the U.S. Census and the National Center for Health Statistics. The underlying

rationale of cognitive testing is that valid responses to survey questions require participants to: (1) comprehend the question that is asked, (2) retrieve relevant information from long-term memory, (3) determine whether retrieved information is relevant to the question that has been asked, and (4) articulate an appropriate response to the presented question [11]. Cognitive interviews are intensive encounters between researchers and participants who are representative of the communities in which the survey will be implemented. Cognitive interviews frequently involve presenting questions to participants and asking them to "think aloud" as they contemplate their answer to the question. Interviewers also use probes to elicit specific information about how participants responded to questions. Historically, cognitive interviews have been conducted using one-on-one interviews; however, focus group-like settings are also useful platforms for cognitive interviews because collective discussion in a non-threatening environment can help elicit information that could have been suppressed in one-on-one interviews [12].

Cognitive testing was completed with 40 migrant and seasonal farmworkers through two focus groups comprised of 24 farmworkers (10 women, 14 men), and 16 one-on-one interviews with farmworkers (11 women, 5 men). The study was carried out in two locations, one focus group and 10 cognitive interviews were done in Texas and the remaining focus group and six cognitive interviews were done in Florida. Participants were selected by convenience through farmworker service providers. The cognitive testing was facilitated by two experienced, native Spanish speaking bilingual researchers, each with 19 years experience conducting qualitative and quantitative research with farmworkers, including testing instruments, scales and communication materials for several US agencies (e.g., the Census Bureau, the US Department of Labor, the Bureau of Labor Statistics, the US Treasury, the US Department of Health and Human Services and the Environmental Protection Agency). The lead researcher responsible for implementing and overseeing data collection is a national expert who was involved in developing cognitive interviewing approaches for immigrant low income Latinos, including farmworkers and similar populations [13]. The researchers directly involved in data collection were from different Spanish-speaking areas, one Peruvian who formerly lived in Mexico and one Mexican-American. Together, they have extensive experience (19 years) with the variants of Spanish spoken by farmworkers, including Spanish-speakers from Mexico, Central America, the Caribbean as well as U.S. born Spanish speakers. All participants spoke Spanish; five of the focus group participants and four of the cognitive interviewees were bilingual Spanish-indigenous language speakers. All encounters were audio taped and the tapes reviewed and summarized

into findings. Respondents signed a statement acknowledging the purpose of the study and the proposed uses of the information. All participants received a payment for their participation.

The “psychosocial elements of farmwork” module is comprised of items tapping distinct domains of interest (Appendix A). The module led with the K-6, a short form instrument designed to quantify levels of psychological distress [14]. Next, selected items from the Job Content Questionnaire [15] assessing “job demands” (2 items), “decision latitude” (4 items), and “job insecurity” were adapted. The items were adapted to: (1) make explicit reference to participants’ activities in farmwork; and (2) to replace the affectively-based response categories (strongly agree to strongly disagree) with a frequency-based response categories. This decision was based on previous reports indicating that farmworkers have difficulty differentiating levels of “agreement” in affectively-based response options [16]. Based on evidence indicating that the physical separation from family may undermine farmworker mental health [17, 18], a single item from the Migrant Farmworker Stress Inventory [19] was used to assess frequency of concern or worry about family members back home. Finally, a series of items adapted from the 1994 Disability Supplement of the National Health Interview Survey [20] and the MOS SF-36 [21] were used to assess work limitations due to physical health, limitations due to mental health, work-related absence because of illness or injury, and general health status.

The Flieschman-Kincaid grade level of readability for the English items in the “psychosocial elements of farmwork” module ranged from 3.7 to 14.1. The average score across the K-6 items was 8.9 (range 4.0 to 14.1), while the average grade level for the Job Demands and the Decision Latitude items was 4.85 (range 4.8–4.9) and 4.2 (range 3.7–5), respectively. Translation of items for cognitive testing was undertaken using an expert team approach [22]. Team members brought a mix of skills and interdisciplinary expertise. The team included native Spanish bilingual interviewers and researchers, as well as researchers with some familiarity with Spanish, and expertise conducting surveys with the target population (migrant farmworkers). Although a team of native Spanish speaking researchers and interviewers provided the initial translations when none was found in the available literature, the investigative team reviewed the wording as a group, providing additional versions and agreeing on a final version to undergo cognitive testing.

The format of the cognitive testing encounter was similar in both the focus group and the one-on-one interviews. First, participants were told that the purpose of cognitive testing was to ensure that farmworkers understood the purpose and format of survey questions. Next, the general purpose of both

the K-6 and selected items from the JCQ were explained to participants. Interviewers read each individual item. After reading each item, participants were probed about their interpretation of the item. The probes were intended to identify whether participants understood the item, whether they were able to respond and the reasons for any misunderstanding or lack of response. These methods are consistent with those recommended by the Census Bureau [23] and other survey methodologists [24] for the pre-field testing and evaluation for censuses and other surveys [25].

Results

Separate issues arose for discrete sets of items. We therefore present the results of our analyses by instrument to better illustrate the main issues identified in the data.

The K-6 Instrument for Assessing Mental Health

Two dominant themes regarding the K-6 instrument were evident from comments made in both the focus group and the cognitive interviews. The first theme emphasized item structure. Participants consistently commented that the items were too long, and that the language used in the items may be inappropriate. With regard to item length, participants complained that each question sounded as if it contained more than one question. The most common response by participants, in the focus group and cognitive interviews, after having heard an item read was to request that it be re-read or to seek clarification. In only two cases did a respondent not request clarification, and in both cases the respondent was fully bilingual and had completed a high school education in the U.S.

Several points were raised about the wording of the K-6 items. There was general agreement that the language used in the items was too formal and intimidating, and that the language use did not resemble regular conversation among farmworkers. Some participants commented that the wording seemed to be designed for upper-class Spanish-speakers. Indeed, one participant commented “La forma de las preguntas suenan muy ‘fresa,’” using a common Mexican slang term to refer to the upper class. Others suggested that the items seemed to be designed more for reading than for verbal questioning. Finally, participants expressed difficulty with the tense of the K-6 items because they were constructed using simple past tense. Specifically, questions ask “during the last 30 days, how often did you feel...”. Grammatically, this structure restricts responses to something that has already finished in the past. Yet, the intent of the items is to assess feelings over the past 30 days, including today. This intent requires the use of the present perfect tense (e.g., “How often have you felt...?”).

The second dominant theme arising from the cognitive tests of the K-6 items was the cultural connotations associated with word selection. Words like “inquieto” and “intranquilo” (“restless” and “fidgety”) were construed by participants as describing children’s behavior, not a type of behavior relevant to adults. Similarly, the cultural meaning of word choices in other items created problems for participants. For example, the word “esperanza” was used in an item asking about “hopelessness”. Most respondents responded to the item referring to a proverb commonly known throughout Spanish-speaking countries: “la esperanza es lo último que se pierde” meaning “hope is the last thing one loses.” In a similar fashion the word used to capture feeling uselessness “inútil” was perceived by respondents as being a pejorative word that is used to insult someone who is lazy.

Job Content Questionnaire Items

Job Demands

Participants did not have a clear or consistent understanding of the job demands items. In response to the item, “my job requires me to work very hard,” focus group participants had different interpretations of the item. Some participants interpreted the item in terms of whether or not the individual had a work contract (“...si te están pagando por contrato”) or worked piece rate. Others took “work very hard” to mean physical aspects of the work such as whether the job requires stooping down or bending over (“...se está agachado”) or working when it is hot (“si está caliente”) or working at dawn when it is cold (“hay que ir en la madrugada cuando está frío”). Likewise, interview participants had diverging understanding of the item; some took the item to refer to the quantity of work, others to the difficulty of work, and still another to the speed of work.

Similar ambiguity was expressed in response to the job demand item asking about “excessive amounts of work”. Participants expressed confusion about the meaning of excessive work, and some took it to mean working more hours than the normal eight (“trabajar más tiempo de las ocho normales). Other participants suggested that “hard” and “excessive” had the same meaning and they referred to it as tiring work (“trabajo cansativo”).

Decision Latitude

Participants generally understood the items assessing decision latitude, but there were points of confusion. Several participants believed that the item about skill level (“destreza”) had a stress-related meaning. However, although generally understood, respondents had difficulty responding to the decision latitude items because of relevance. For

example, in response to an item about asking freedom to make decisions on the job, one respondent said “there is not much to decide, but pick what there is to pick” (“...no hay que decidir, solo ‘pizar’ lo que hay que”). Similarly another participant said “everyone harvests the same way, the only difference is that some may be faster (“todos hacemos el mismo trabajo, sólo que algunos más rápido que otros”). Participants agreed that supervisors (“mayordomos”) have the opportunity to make decisions. Similarly items about opportunities for creativity and level of required skill were generally understood, but respondents found them irrelevant to farmwork. In response to the creativity item, for example, several participants commented that there is nothing creative in the field (“pues, no hay nada creativo en el campo”). Likewise, in response to the item about level of skill, most participants commented that “it doesn’t take long to learn field work” (“no demora aprender la labor”).

Job Insecurity

Participants understood the job insecurity questions, but again saw little relevance in the items because of the seasonal or temporary nature of farmwork. Participants generally agreed that farmworkers never worry about losing their jobs, in large part because everyone knows when the season starts and ends. Likewise, most participants commented that finding another job in farmwork is generally easy because farmworkers know when and where work is available, although some participants commented that there are fewer farmwork jobs today than previously because of closings and increased numbers of farmworkers.

More salient than outright job loss to participants were short-term lapses in work because of weather. Following up on a participant comment that farmworkers do not worry about job loss, another participant stated “unless it rains a lot and we cannot work, then I worry because I cannot earn any money” (“...a menos que llueva mucho, ahí sí, porque ya no gano nada”). In response to a specific probe, participants agreed that farmworkers were almost never fired. When someone was fired, it occurred in response to an extreme situation such as if the worker reported to work drunk, caused an injury in the field, or started a fight with another worker.

Other Items

Separation from Family

Participants had little difficulty understanding and responding to an item about the emotional difficulty associated with being separated from family. However, two issues were raised by participants. The first revolved around the issue of who is considered family. Participants explained kinship patterns with relatives in Mexico as if to

say that family members are always left behind. The second issue revolved around the amount of time an individual has been in the U.S. For example, after responding “not at all concerned” (“Nada”) about the separation from family, one participant explained that he had not been in contact with his relatives for many years and no longer felt any attachment with them.

Work-limitations

Participants generally stated that they understood separate items asking about limitations at work because of physical health or mental health; however, when probed several indicated that the word “limitación” (limitation) was confusing in the question. Participants suggested that the items would be clearer if the item used a more definitive term like “impida” (prevent). Additional comments by participants, however, highlighted potential problems with the item because the physical demands of farmwork necessitate optimal health. As one participant put it “in the field, if one is disabled, one cannot work” (“en la labor, si uno está discapacitado, no puede trabajar”).

Missing or Unable to Work Because of Illness or Injury at Work

Participants understood these questions. However, most also indicated that they have worked while sick because they did not want to miss the opportunity to make money. Among participants who indicated missing or being unable to work, two participants from the focus group and two in-depth interview participants, were unable to quantify the number of days missed.

Discussion

The goal of this study was to assist researchers in selecting appropriate instruments for studying farmworker mental health and the work-related factors that may undermine mental health. To accomplish this goal, items from selected instruments were subjected to cognitive interviews by immigrant farmworkers. The overall pattern of results indicated that standard Spanish translations of instruments commonly used in survey research were not appropriate for use with farmworkers, in large part because of farmworkers relatively unique sociodemographic profile (e.g., low levels of formal education and impoverished) and the inherent realities of farmworkers daily lives (e.g., there is little opportunity for personal control in farmwork). Collectively, these results suggest that researchers interested in studying farmworker mental health need to be cautious in selecting instruments for measuring key concepts.

The results of this study indicate that the K-6 may be inappropriate for measuring farmworker mental health. The structure of the K-6 items was problematic for farmworkers on multiple levels: the items were too long and complex, the language was described as too formal, and word selection was occasionally culturally inappropriate. These findings suggest that the relatively unique sociodemographic profile of farmworkers raises issues that are not encountered when items are translated for general samples that may include Spanish-speakers. That is, recognizing that most farmworkers have little formal education and are generally from impoverished backgrounds [26] it is not surprising that they had difficulty responding to the K-6 and found the language in the items to be beyond that used in everyday conversation. It is not clear if the inappropriateness of the K-6 for farmworkers rests in a cultural nuance specific to farmworkers or a more general issue of literacy and comprehension. Nevertheless, the comments made by farmworkers during cognitive testing clearly suggest substantial potential for measurement error if the K-6 is used to assess mental health in this population. The questionable suitability of the K-6 raises further problems for mental health assessment among farmworkers. The item structure used in the K-6 is similar to other instruments designed to assess psychiatric morbidity in general population samples, like the Composite International Diagnostic Interview [27, 28] and the Alcohol Use Disorder and Associated Disabilities Interview Schedule [29]. Although assessment of the items in these other instruments awaits testing, the comparability of the item structure raises questions about the feasibility of assessing clinical disorders among farmworkers using current instruments. Until these issues are resolved instruments like the Center for Epidemiologic Studies Depression Scale [30], which use a simpler item structure and have been used in farmworker populations [5, 6, 17, 31] may help to advance understanding of farmworker mental health.

Our results also highlight challenges in selecting instruments to measure putative antecedents of mental health among farmworkers. The JCQ [15] is a validated [32] and widely used instrument measuring components of jobs that are frequently associated with both physical and mental health [33]. However, in this study, JCQ items measuring psychological demand were reported to have ambiguous meaning, whereas items assessing decision latitude were reported to be irrelevant to farmwork. Again, these results highlight the potential for measurement error in instruments that were not designed for use in farmworker populations. The issue of ambiguous meaning can only be resolved through further adaptation of the items to ensure consistent interpretation. In the meantime, however, the problem with ambiguous items can be partially addressed by providing detailed Question by Question

(Q × Q) instructions for interviewers to ensure systematic responses when participants raise questions. Similarly, detailed Q × Q instructions should be developed to handle potential questions or objections arising by participants in response to the presumed relevance of the decision latitude items. Nevertheless, despite widespread evidence suggesting that job demands and control may affect worker health, our results suggest that items from the JCQ should be used cautiously in studies of farmworker mental health.

Finally, the results of this study suggest that items about work-related limitations because of physical and mental health, or illness-related work-loss time should also be used cautiously in farmworker mental health research. First, researchers need to recognize that farmworkers will consistently work, even when injured, to avoid losses in pay. Therefore, any estimate of limitation for absence due to illness or injury is likely an underestimate. Second, when farmworkers do report absences because of illness or injury, they may have difficulty providing a concrete estimate of days absent. Researchers may want to offer simple response categories to participants who cannot provide a definitive estimate of work loss time.

The results of this study need to be interpreted in light of its limitations. Our cognitive tests were undertaken with 24 individuals identified by convenience, thereby raising questions about generalizability. Only a small number of instruments and items were assessed in this study. As the literature devoted to farmworker mental health matures, researchers will evaluate other instruments and items to ensure that concepts of interest are being measured with high quality instruments. In cross-cultural research the advantages of using existing available instruments is considerable. This provides both a pretest and replication of items as well as allowing for comparisons across cultural groups. However, adapting questions used in one context to another may change meanings and detract from their reliability. In this study, both language driven adaptations and culture-driven adaptations were made. Ideally, adapted questions should be treated as new questions, and the equivalence with original versions be tested [34].

Limitations notwithstanding, the results of this study contribute to the literature. Our results suggest that commonly used instruments in studies of mental health may not be directly appropriate for studying farmworker mental health. The K-6, a new and widely used instrument, was described by participants as being too complex, formal, and using concepts that may be viewed as pejorative. Similarly, items from the Job Content Questionnaire, an instrument frequently used in occupational stress research, were not consistently interpreted and were characterized as irrelevant to farmworkers. Collectively these results highlight the challenges of conducting research with farmworkers, and they suggest that researchers interested in studying

farmworker mental health need to select instruments cautiously. Specifically, researchers need to avoid the use of simple, direct translations of survey items that may be culturally inappropriate for farmworkers. Rather, researchers need to closely scrutinize the meaning of translated items to ensure their cultural relevance to farmworkers.

Acknowledgments Funding was provided by the National Institute for Occupational Safety and Health. The findings and conclusions in this report are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health. The authors would like to express appreciation to Dr. Ronald Kessler, Dr. Jose Aguilar-Gaxiola, and Dr. Todd Strauss for providing the K-6 in Spanish. The authors are also grateful to Drs. Thomas A. Arcury and Sara Quandt for providing a translated version of the job content items adapted for farmwork.

Appendix A

English and Spanish versions of items subjected to cognitive testing

English	Spanish
<i>Mental health (K6 items)</i>	
Q1a. The next questions are about how you have been feeling during the past 30 days. About how often during the past 30 days did you feel nervous—would you say all of the time, most of the time, some of the time, a little of the time, or none of the time?	Q1a. Las siguientes preguntas son acerca de cómo se ha sentido en los últimos 30 días. En los últimos 30 días, ¿con qué frecuencia, se sintió nervioso(a)—diría que todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?
Q1b. During the past 30 days, about how often did you feel hopeless—all of the time, most of the time, some of the time, a little of the time, or none of the time?	Q1b. En los últimos 30 días, ¿con qué frecuencia se sintió sin esperanza—Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?
Q1c. During the past 30 days, about how often did you feel restless or fidgety? (IF NEC: all, most, some, a little, or none of the time?)	Q1c. En los últimos 30 días, ¿con qué frecuencia se sintió inquieto(a) o intranquilo(a)? (SI NEC: ¿Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?)
Q1d. How often did you feel so depressed that nothing could cheer you up? (IF NEC: all, most, some, a little, or none of the time?)	Q1d. En los últimos 30 días, ¿con qué frecuencia se sintió tan deprimido(a) que nada podía levantarle el ánimo? (SI NEC: ¿Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?)
Q1e. During the past 30 days, about how often did you feel that everything was an effort? (IF NEC: all, most, some, a little, or none of the time?)	Q1e. En los últimos 30 días, ¿con qué frecuencia sintió que todo le costaba mucho esfuerzo? (SI NEC: ¿Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?)

Appendix continued

English	Spanish
Q1f. During the past 30 days, about how often did you feel worthless? (IF NEC: all, most, some, a little, or none of the time?)	Q1f. En los últimos 30 días, ¿con qué frecuencia se sintió inútil? (SI NEC: ¿Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?)
Q2. The last set of questions asked about feelings that might have occurred during the past 30 days. Taking them altogether, did these feelings occur more often in the past 30 days than is usual for you, about the same as usual, or less often than usual?	Q2. Hemos revisado experiencias y sentimientos que le pudieron haber ocurrido en los últimos 30 días. Tomando todos en cuenta ¿estos sentimientos fueron más frecuentes en los últimos 30 días de lo que es usual para usted, fueron tan frecuentes como es usual, o menos frecuentes de lo usual?
Q2a. A lot less than usual, somewhat less, or only a little less than usual?	Q2a. ¿Esto es mucho, algo o un poquito menos frecuente de lo usual?
Q2b. A lot more than usual, somewhat more, or only a little more than usual?	Q2b. ¿Esto es, algo o un poquito menos frecuente de lo usual?
Q4. The next questions are about how these feelings may have affected you in the past 30 days. How many days out of the past 30 were you totally unable to work or carry out your normal activities because of these feelings?	Q4. Las siguientes preguntas son acerca de cómo estos sentimientos le han afectado en los últimos 30 días. ¿Cuántos de los últimos 30 días fue totalmente incapaz de trabajar o llevar a cabo sus actividades normales debido a estos sentimientos?
Q6. [Not counting (that day/those days)], how many days in the past 30 were you able to do only half or less of what you would normally have been able to do because of these feelings?	Q6. [Sin contar (ese día/esos días)], ¿cuántos días de los últimos 30 pudo hacer solamente la mitad o menos de lo que normalmente puede hacer debido a estos sentimientos?
Q7. During the past 30 days, how many times did you see a doctor or other health professional about these feelings?	Q7. En los últimos 30 días, ¿cuántas veces consultó a un médico u otro profesional de la salud debido a estos sentimientos?
Q8. During the past 30 days, how often have physical health problems been the main cause of these feelings—all of the time, most of the time, some of the time, a little of the time, or none of the time?	Q8. En los últimos 30 días, ¿con qué frecuencia los problemas de salud física fueron la causa principal de estos sentimientos—Todo el tiempo, la mayor parte del tiempo, algunas veces, casi nunca, o nunca?
<i>Job demands</i>	
How often does your job in farmwork require you to work very hard? (Seldom or Never, Sometimes, Often, [Almost] Always)	¿Con qué frecuencia su trabajo del campo le requiere que trabaje muy duro? (Casi nunca o nunca, Algunas veces, Casi Siempre, Todo el tiempo)

Appendix continued

English	Spanish
How often are you asked to do an excessive amount of work?	¿Con qué frecuencia se le pide que trabaje en exceso?
<i>Decision latitude</i>	
How often do you have a lot of say about what happens on your job? (Seldom or Never, Sometimes, Often, [Almost] Always)	¿Con qué frecuencia tiene usted la oportunidad de participar de tomar decisiones sobre lo que pasa en su trabajo? (Casi nunca o nunca, Algunas veces, Casi Siempre, Todo el tiempo)
How often does your job require a high level of skill?	¿Con qué frecuencia su trabajo del campo requiere un nivel alto de destreza?
How often do you have the freedom to decide how you do your farmwork?	¿Con qué frecuencia tiene usted la libertad de decidir cómo hacer su trabajo del campo?
How often does your job in require you to be creative?	¿Con qué frecuencia su trabajo del campo requiere que usted sea creativo?
<i>Job insecurity</i>	
How often do you worry about losing your job? (Often, Sometimes, Rarely)	¿Con qué frecuencia se preocupa usted que podría perder su trabajo? (Siempre, Algunas Veces, Nunca)
How easy would it be for you to find another job of equivalent pay? (Very Easy, Somewhat Easy, Not at all Easy)	¿Qué tan fácil sería para usted encontrar otro trabajo donde le paguen igual? (Muy Fácil, Algo Fácil, Nada Fácil [Difícil])
<i>Concern or worry about family in home country</i>	
How concerned or worried are you about family members back home? (Very Much, Somewhat, Not at all)	¿Cuánto se preocupa usted por su familia en su país? (Mucho, Algo [Más o Menos, Un POCO, Nada)
<i>Work limitations due to physical health</i>	
Are you limited in any way in work because of physical problems? (Yes, No)	¿Tiene Usted alguna limitación para hacer su trabajo debido a un problema físico? (Sí, No)
<i>Work limitations due to mental health</i>	
Are you limited in any way in work because of mental or emotional problems? (Yes, No)	¿Tiene Usted alguna limitación para hacer su trabajo debido a problemas mentales o emocionales? (Sí, No)
<i>Work-related absence because of illness or injury</i>	
During the PAST 12 MONTHS, that is, ABOUT how many days did you miss work because of a work-related illness or injury?	En los últimos 12 meses, ¿cuántos días NO trabajó debido a/por causa de alguna enfermedad o accidente relacionado con su trabajo?
<i>General health status</i>	
In general, how would you describe your health? (Excellent, Good, Fair, Poor)	En general, ¿Cómo se siente de salud? Excelente, Bien, Regular, o Mal?

References

1. Frank AL, McKnight R, Kirkhorn SR, Gunderson P. Issues of agricultural safety and health. *Annu Rev Public Health*. 2004;25:225–45.
2. Cooper SP, Burau KE, Frankowski R, et al. A cohort study of injuries in migrant farm worker families in South Texas. *Ann Epidemiol*. 2006;16:313–20.
3. McCurdy SA, Samuels SJ, Carroll DJ, Beaumont JJ, Morrin LA. Agricultural injury in California migrant Hispanic farm workers. *Am J Ind Med*. 2003;44:225–35.
4. Alderete E, Vega WA, Kolody B, Aguilar-Gaxiola S. Lifetime prevalence of and risk factors for psychiatric disorders among Mexican migrant farmworkers in California. *Am J Public Health*. 2000;90:608–14.
5. Grzywacz JG, Quandt SA, Early J, Tapia J, Graham CN, Arcury TA. Leaving family for work: ambivalence and mental health among Mexican migrant farmworker men. *J Immigr Health*. 2006;8:85–97.
6. Hovey JD, Magaña CG. Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the mid-west United States. *J Immigr Health*. 2000;2:119–31.
7. Hovey JD, Magaña CG. Exploring the mental health of Mexican migrant farm workers in the midwest: psychosocial predictors of psychological distress and suggestions for prevention and treatment. *J Psychol*. 2002;136:493–513.
8. Banks J, Marmot M, Oldfield Z, Smith JP. Disease and disadvantage in the United States and in England. *JAMA*. 2006;295:2037–45.
9. Peele PB, Tollerud DJ. Depression and occupational injury: results of a pilot investigation. *J Occup Environ Med*. 2005;47:424–7.
10. Johnson TP, O'Rourke D, Chavez N, et al. Cultural variations in the interpretation of health survey questions. In: Warnecke RB, editor. *Health survey research methods: conference proceedings*. Washington, DC: National Center for Health Statistics; 1996. p. 57–62.
11. Warnecke RB, Johnson TP, Chavez N, et al. Improving question wording in surveys of culturally diverse populations. *Ann Epidemiol*. 1997;7:334–42.
12. Arteaga S, Geiger-Brown J, Muntaner C, Trinkoff A, Lipscomb J, Delp L. Home care work organization and health: do Hispanic women have different concerns? *Hisp Health Care Int*. 2002;1:135–41.
13. Kissam E, Herrera E, Nakamoto JM. Hispanic response to census enumeration forms and procedures. Report prepared by Aguirre International for the Census Bureau; 1993.
14. Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med*. 2002;32:959–76.
15. Karasek R, Theorell T. *Healthy work: stress, productivity, and the reconstruction of working life*. New York: Basic Books; 1990.
16. Grzywacz JG, Quandt SA, Arcury TA. Immigrant farmworkers' health-related quality of life: an application of the job demands-control model. *J Agric Safety Health*. 2008;14:79–92.
17. Grzywacz JG, Quandt SA, Arcury TA, Marin A. The work-family challenge and mental health: experiences of Mexican immigrants. *Community Work Fam*. 2005;8(3):271–9.
18. Hovey JD, Magaña CG. Psychosocial predictors of anxiety among immigrant Mexican migrant farmworkers: implications for prevention and treatment. *Cultural Divers Ethnic Minor Psychol*. 2002;8:274–89.
19. Magaña CG, Hovey JD. Psychosocial stressors associated with Mexican migrant farmworkers in the midwest United States. *J Immigr Health*. 2003;5:75–86.
20. Adams PF, Marano MA. Current estimates from the National Health Interview Survey, 1994. National Center for Health Statistics; 1995. p. 10.
21. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36) I. Conceptual framework and item selection. *Med Care*. 1992;30:473–83.
22. Harkness J. Questionnaire translation. In: Harkness J, Van de Vijver FJR, Mohler PP, editors. *Cross-cultural survey methods*. Hoboken, NJ: Wiley; 2003. p. 35–56.
23. DeMaio TJ, Bates N, Willimack D, Ingold J. Pretesting questionnaires and related materials for surveys and censuses. 2006. Retrieved May, 18, 2007 from http://www.census.gov/quality/S11-0_v1.2_Prestesting.htm.
24. Dillman DA. *Mail and internet surveys: the tailored design method*. New York: Wiley; 2000.
25. Forsyth BH, Lessler JT. Cognitive laboratory methods: A taxonomy. In: Biemer PP, Groves RM, Lysberg LE, Mathiowetz NA, Sudman S, editors. *Measurement errors in surveys*. New York: Wiley; 1991. p. 393–418.
26. National Agricultural Workers Survey, Public Access Data, 1989–2006. U.S. Department of Labor, Employment and Training Administration, Office of Policy Development and Research: <http://www.doleta.gov/agworker/naws.cfm>. Accessed 5 Aug 2008.
27. Alegria M, Mulvaney-Day N, Torres M, Polo A, Cao Z, Canino G. Prevalence of psychiatric disorders across Latino subgroups in the United States. *Am J Public Health*. 2007;97:68–75.
28. Kessler RC, Ustun TB. The World Mental Health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13:93–121.
29. Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Anderson K. Immigration and lifetime prevalence of DSM-IV psychiatric disorders among Mexican Americans and non-Hispanic whites in the United States: results from the National Epidemiologic Survey on alcohol and related conditions. *Arch Gen Psychiatry*. 2004;61:1226–33.
30. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Measurement*. 1977;1:385–401.
31. Hovey JD. Acculturative stress, depression, and suicidal ideation among Central American immigrants. *Suicide Life Threat Behav*. 2000;30:125–39.
32. Karasek R, Brisson C, Kawakami N, Houtman I, Bongers P, Amick B. The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *J Occup Health Psychol*. 1998;3:322–55.
33. Belkic KL, Landsbergis PA, Schnall PL, Baker D. Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health*. 2004;30:85–128.
34. Harkness J, Van de Vijver FJR, Johnson TP. Questionnaire design in comparative research. In: Harkness J, Van de Vijver FJR, Mohler PP, editors. *Cross-cultural survey methods*. Hoboken, NJ: Wiley; 2003. p. 19–34.