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*Risks and Symptoms of Lower Back Pain in a  
Migrant Farmworker Population in Rural Maryland*

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## INTRODUCTION

Musculoskeletal disorders are one of the two leading categories of occupational diseases and injuries in the United States<sup>1</sup>. Of the musculoskeletal disorders, lower-back injuries are the most common and costly<sup>2</sup>. In occupational lower back pain, weightlifting, bending, and twisting were the most common causes of each episode of lower back pain<sup>1,3</sup>. Agriculture, one of the most hazardous occupations, is especially prone to work in awkward positions around very dangerous equipment and heavy weights<sup>3,4</sup>. Farmworkers are exposed to many of the risk factors associated with musculoskeletal injury such as lifting and carrying heavy containers, difficult work positions such as stooping and forward bending, an excessively fast work pace, and whole body vibration<sup>5</sup>. In the United States, there are approximately 2.7 million migrant and seasonal farmworkers and dependents<sup>6</sup>. Unfortunately, little is known about occupational-derived lower back pain and other musculoskeletal disorders in the farmworker population, which for the most part, consists of migrant and seasonal farmworkers.

The overall goal of this research study is to identify possible job-related risk factors that contribute to musculoskeletal disorders in the lower back in a population of migrant and seasonal tomato harvesters on the eastern shore of Maryland. The objectives of this study are:

1. To identify the prevalence and incidence of lower back pain among the farmworkers.
2. To compare the sensitivity and specificity of a worker-implemented symptoms questionnaire to a standard epidemiological symptoms questionnaire.
3. To assess self-reported job-related risk factors using a worker-implemented questionnaire.
4. To assess the actual manual handling tasks of the farmworkers on-site in order to objectively quantify the job-related risk factors.

## METHODS

In this study, a questionnaire was given to a cross-sectional sample of migrant farmworkers who harvested tomatoes in the areas of Worcester and Somerset Counties on the eastern shore of Maryland. The questionnaire was adapted from three sources: a musculoskeletal symptoms survey for sheet metal workers created by the National Institute of Occupational Safety and Health (NIOSH), a musculoskeletal symptoms survey under development by an unnamed federal agency, and general questions deemed appropriate from a literature review on migrant farmworkers. The questionnaire was verbally administered in the farmworkers' native languages (Spanish or Creole) during the evenings to a sample of non-random migrant farmworkers over 18 years of age, either individually or in groups. The interviews were given in three sites: a night clinic at one site, the apartment dwelling of some farmworkers at another location, but predominantly at a residential camp in which approximately 450 to 500 migrant farmworkers lived. The people interviewed consisted mainly of workers from three crews living at the far and near ends and in the middle of the residential camp. Subject recruitment was accomplished by direct solicitation after dinner on workdays. Informed consent was obtained from each person interviewed before they participated in the study. The subjects interviewed were not compensated for their participation. The interviews were conducted between June 26 and July 13. Besides

administering the questionnaire, another role of the investigators was to clarify any questions the farmworkers raised to ensure that responses be as accurate and consistent as possible.

The questionnaire, which took approximately 15 minutes to administer, was divided into three sections. In the first section, basic demographic information was collected. Some important questions on the first part concerned specific work characteristics. The second part of the questionnaire focused on job-related risk factors to the lower back. Before the study began, it was hoped that this section could be administered to groups of approximately five workers in order to obtain a more accurate and consistent answer. However, due to the time factor involved in administering the remainder of the questionnaire, only one such group was interviewed for job-related risk factors to the lower back. Although the second part of the questionnaire was not administered, the researchers were able to travel to the farms and observe an actual work day. The risk factors were thus assessed by observation of their job tasks, the timing of specific job tasks, the weighing of baskets of tomatoes, and also by the actual harvesting of plum tomatoes by the researchers during a portion of the work day. The final section of the questionnaire comprised two symptom surveys that contained similar questions concerning lower back pain symptom formation adapted from the unnamed federal agency and from NIOSH. The questions were administered consecutively, always starting with the questions adapted from the federal agency. In this manner, the investigators hoped to see which questions were better suited for the migrant farmworker population as standard questionnaires have not been developed for this group of workers.

Of the 65 individuals interviewed, five records were discarded since they did not pick tomatoes. Three of them worked as truck or bus drivers for the farmworkers and the other two did not work on a farm as tomato harvesters. The final sample size for analysis was sixty. The data collected was statistically analyzed using the EpiInfo 6.02 statistical analysis software program distributed by the Centers of Disease Control. Five records were discarded since those workers interviewed were not tomato harvesters. Furthermore, once the questionnaire was pilot-tested, some questions were eliminated due to time constraints and/or irrelevance. A copy of the questionnaire administered may be found in the appendix.

## RESULTS

Of the sixty records, 95 percent were Latino and five percent were blacks from Haiti. Ninety percent of those interviewed were males, which was rather similar to the actual proportions of working men and women. Generally, approximately 3/4 of the farmworkers interviewed were born in Mexico with the remaining 1/4 from Central America, Haiti, the United States, and Puerto Rico. The exact results may be found in Tables 1, 2, and 3 in the DATA section in the appendix.

Before arriving on the eastern shore to harvest tomatoes, 83.3 percent of the sample had also worked as farmworkers (Table 4). The "typical" worker interviewed was a male around 31 to 32 years old who has toiled as a farmworker for 10 to 12 years and has worked on the farms near the interview site for 7 weeks. He generally worked five or six days a week for around seven hours a day whenever work was available. During the day, the worker usually only took one lunch break lasting around thirty minutes, but other infrequent water breaks lasting less than

one minute were also observed (see Table A). They were paid piece-rate at either 40 or 60 cents per bucket filled, depending on whether the tomatoes picked were large round ones or the smaller plum (Roma) variety, respectively. When filled, a basket of plum tomatoes weighed around 32.4 pounds with a standard deviation of 0.995 pounds. According to a knowledgeable source, a basket of large round tomatoes would weigh approximately 40 pounds due to its higher water content. Generally, a worker would pick between 140 and 180 or more baskets of tomatoes per day, depending on the length of the workday.

During a work day, the tomato harvesters were exposed to many job-related risk factors to the back and lower extremities. A typical picking cycle consisted of (with approximate duration of each task in parentheses):

1. Catching an empty basket from the tomato dumper on the truck (2 sec)
2. Walking to a row of unpicked tomato plants (10 sec)
3. Filling the basket of tomatoes as rapidly as possible (1 min 30 sec)
4. Lifting the filled basket from the ground to one shoulder (1 sec)
5. Walking to the truck with the basket on one shoulder with one hand underneath the basket for balance (10 sec)
6. Forcefully tossing the basket from 3 to 12 feet away to the tomato dumper's hands, which are situated 6.5 to 7.5 feet above ground level (2 sec)
7. Waiting to receive an empty basket with a ticket representing each filled basket dumped (3 sec)

For the farmworker population, occupational factors such as previous back injury, heavy lifting and carrying, difficult work positions, and an excessively fast work pace contribute to back strain<sup>7</sup>. In the picking cycle, the job tasks that qualify as risk factors for the lower back were from step 3 to step 6. During the rapid filling of the tomato basket, different levels of mild bending of the torso between 20° and 45° and severe bending of the torso greater than 45° were observed, depending on the individual worker's preferred picking posture or on the height of the tomato plants. Kneeling and squatting were also required during a large portion of the basket-filling phase. On the day the observations were made, the temperature was in the mid-eighties with low humidity, light breezes, and a cloud cover during most of the morning. On that day, the workers picked from around 9:00 in the morning to 3:30 in the afternoon. The mean filling time for each basket was 1 minute 27.68 seconds with a standard deviation of 24.14 seconds.

Risk factors to the back and lower extremities were also observed during the next job task, which was lifting the filled basket weighing approximately 32 pounds from the ground to the shoulder. Typically, the average horizontal distance of the lift was 4 to 10 inches from the body. The lift, often initiated in a seated or kneeling position, was then executed in the sagittal plane with the dominant lifting arm of the worker resting underneath the basket. The total time for the lifting action was less than one second per repetition. The next job task entailed walking to the truck with the basket on one shoulder. Since the truck moves along the rows of tomatoes as they are being picked, the walking distance can vary from a few feet to more than forty feet. Generally, this step took less than 10 seconds to execute. Finally, the worker had to throw the filled basket to the tomato dumper standing on the truck. The throwing action is essentially a single-armed forceful lift above the shoulders that propels the basket into the waiting hands of the

tomato dumper. Although some workers were observed using only their arms to propel the basket, others were seen to use their legs as well. For those who had to throw the baskets over horizontal distances greater than 7 feet, both arms as well as the legs were used to achieve the force necessary to heave the baskets to the tomato dumper. Each throwing repetition generally lasted from 1 to 2 seconds. During the day of observation, the mean number of baskets picked in 6.5 hours was 165.7 with a standard deviation of 32.5 in a crew of 46 workers. Overall, factoring in water breaks and idle time between tasks, it was observed that the tomato harvester spent more than 75 percent of the work day performing tasks which were risk factors to the back and lower extremities.

An unpublished workplace risk factor checklist under development states that if the checklist score exceeds 5 for the part of the body in question, the job is considered to be a problem job. Although not all questions in the risk factor checklist were used for the back and lower extremities, it was found that the score of the three relevant risk factors in the Awkward Postures section was either a 6 or 7 (Part II of questionnaire). A score of one was assigned to the risk factor *mild bending of the torso between 20° and 45°* (2 to 4 hour duration). A score of two or three was assigned to *severe forward bending of torso more than 45°* (2 to 4 or 4 to 8 hour duration, respectively). The scores differed since individual picking positions varied widely across the crew. Some were exclusively severe forward benders while others worked in more ergonomically suitable positions. The risk factor of kneeling and squatting was assigned a score of three (4 to 8 hours) since this posture constituted a major portion of the basket-filling task. The other Awkward Postures included in this study did not receive a score since those postures were not part of the work cycle. Contact Stresses and Push/Pull Forces were not encountered during the work cycle. Since the harvesters worked by piece-rate and were unsure of when they would work next after they have finished harvesting one farm, their work pace was extremely rapid.

### **Analysis of the questionnaire**

With so many work-related risk factors it was surprising that only 29 out of the sixty respondents, or 48.3 percent, answered "yes" to the question "*Do you ever have job-related lower back pain?*" (Table 5) The two people who answered "don't know" did not know if their back pain was job-related. In the questionnaire, if the respondent answered "yes" to the previous question, they were to continue with the next question. Otherwise, the rest of the first part would be skipped and part III of the questionnaire would be administered. Of those who did not answer "no" or "don't know" to the previous question, the next question asked if they ever took breaks due to job-related lower back pain. Fifty-six percent of the respondents answered "yes" while forty-one percent answered "no." The total number of respondents exceeded the expected number by one due to interviewer error in administering the question to someone who had said "no." (Table 6)

For those who believed that they have had job-related lower back discomfort, 88.9 percent experienced pain (Table 7). From this point forward, the number reporting LBP decreased by one because one subject reported having no lower back pain on Symptoms Survey A of part III of the questionnaire but reported having lower back pain on Survey B of part III. Generally, around 70 percent of those with lower back pain (LBP) thought that excessive work was the cause.

Interestingly, almost 90 percent of the respondents believed that their LBP was caused by some aspect of work, such as excessive work, posture, and environment (Table 8). Most of those, 57.1 percent, reported that their LBP has remained about the same since the time of onset while 21.4 percent thought that their LBP has improved. Of the respondents, 21.4 percent also said that their LBP has worsened since the time of onset (Table 9). Of those who reported having job-related LBP, all of them became aware of the problem while employed as a farmworker, and 96.4 percent thought that the LBP was caused by their work as farmworkers (Tables 10 and 11).

Only about forty percent reported that they have seen a health care worker for their LBP, and they were most commonly prescribed painkillers for their pain (Tables 12 and 12a). Of the 14 respondents who further elaborated on the specific activities which worsen their LBP, 8 specified bending over when picking, 5 stated lifting the basket from the ground to the shoulder, and one said walking (Table 13 and 13a). In the study, there was a trend which showed that the workers who have worked in the fields from 5 to 9 years were 1.31 times as likely as those who have only worked from 0 to 4 years to have LBP. For those who have been working for 10 years or more as a farmworker, they were 2.43 times more likely than the 0 to 4 year group to have LBP. Although the finding was not significant, with a  $p$ -value= 0.14314, the trend is worth noting (Table 14). If more interviews were given with the same odds ratios, the  $p$ -value may become significant. Other tests which tried to correlate age and gender with the development of job-related LBP were inconclusive.

#### Question Comparison between Symptom Survey A and Symptom Survey B

On Part III, there were enough similar questions between the two symptom survey questionnaires to make a comparison to see which questions from each questionnaire served the interviewed population the best as far as question clarity, comprehension, and response rate. On numbers 33 and 42, the questions both asked for the year the problem was first noticed. Question 42, however, also asked for the month. In the study, only 18.5 percent of the respondents remembered the month when the problem first appeared. The better question for this population would be number 32, from the first symptom survey.

On questions 33 and 45, which sought the duration of each episode of lower back pain, 25 percent of the responses differed. One reason in the discrepancy may be in the wording of the questions. Question 33 specifically asked for the duration of each episode of pain while question 45 asked how long the lower back problem usually lasted. Number 45 may be interpreted as the duration of each episode of pain or the duration of pain in a given year. The ambiguity of the question was probably the reason for the lack of consistent answers. In this instance, the more specific question, number 33, would be better suited for this population. From the results of question 33, 1/3 of the people said that each episode lasted for longer than 6 months while 22.2 percent of them stated that each episode lasted from one hour to one day.

Questions 34 and 44 both asked for the incidence of lower back pain in the past year. Only 2 out of 28 of the responses differed after factoring in for the switch from "daily" in number 44 to "constant" in number 34. Both questions were clearly understood by the subjects interviewed but question 34 may be a better question since it offers the additional choice of "constant." Although questions 36 and 54 do not ask for the same information, they are similar

enough to warrant comparison. In this case, question 54 would be the better question since it is more specific and also asks for the specific activity that worsens the lower back pain. Using the results from question number 34, the incidence rate of LBP in this population was either “constant” or “daily” for two-thirds of those interviewed (Table 15).

Questions 37 and 46 both asked how discomforting the problem is now and over the past year, respectively. Since the time frames are different, different answers were expected. However, only 1 out of the 28 respondents differed in their responses. Question 37 seemed to be easier to comprehend because of its use of a scale from 0 to 4 and its conciseness in asking the question. Furthermore, the workers probably better remember the current discomfort better than the discomfort experienced over the past year. Sixty-three percent of the farmworkers reported that their pain was either mild or moderate while 29.6 percent reported that the pain was severe. The other 7.4 percent stated that their pain was unbearable.

Questions 38 and 53 both asked for the number of days missed from work due to lower back pain. Question 38 was deemed to be the better one since it directly asks the number of days of missed work and can be directly coded as a number. The fact is that since the farmworkers need the money and do not know when they will be picking next, they will generally work through any pain. For instance, some pickers were observed to have shortness of breath and pronounceable limps even as they worked. When the farmworker does not work because of pain, the problem is usually very serious. As expected, about 2/3 of the workers have not missed any work due to lower back pain. Of those who have missed work, approximately 70 percent of them had missed less than one week of work due to their lower back pain.

After examining the questionnaire and revising the questions, it was determined that a revised questionnaire (seen in the appendix) would better serve the farmworker population, specifically the tomato harvesters. On the first part of the revised questionnaire, questions 1-4 and 6-16 should be included in the background and work conditions portion. Question 16, *How many days from work have you missed due to job-related lower back pain?*, should be used rather than either number 38 or 53. On the symptoms survey part of the questionnaire, the revised question order is 29, 31, 32, 43, 37, 34, 33, 35, 40, 54, 55, and 50-52. The 15 questions in part I and the 14 questions in part II should elicit all the relevant information sought in the original questionnaire in approximately half the time. A revised job-related risk factors checklist with suggestions for additional factors to observe in the tomato harvester population may also be found in the appendix following the revised questionnaire. An additional question to consider adding would be the prior history of lower back pain before becoming a farmworker.

## DISCUSSION

In this study, two of the four project objectives were realized. The sensitivity and specificity cannot be determined for there is not yet an accepted “Gold Standard” for diagnosing lower back pain. Also, part II of the questionnaire of self-reported risk factors was not administered due to the lack of time. The prevalence of self-reported lower back pain in the tomato harvesting population interviewed was 48.3 percent. The incidence rate of “constant” or “daily” was 66.7 percent. The job-related risk factors for the back and lower extremities were awkward postures, including forward bending of the torso between 20° and 45°, severe forward

bending of the torso greater than 45°, and kneeling and squatting. Additional risk factors which were not included on the checklist were lack of control over work pace, manual handling risk factors such as one-handed lifts, lifts above the shoulder, carrying objects from ten to more than thirty feet, and lifting while seated or kneeling. The only finding in the study which showed a trend (p-value = 0.14314) was that in the group of workers who have labored in the fields from 5 to 9 years, they were 1.31 times as likely as those who have only worked from 0 to 4 years to have lower back pain. For those who have been working for 10 years or more as a farmworker, they were 2.43 times more likely than the 0 to 4 year group to have lower back pain. Although the finding may appear noteworthy, confounding factors such as the living conditions in the camp and the social lifestyle of the farmworkers may contribute to the development of lower back pain. For instance, in the camp where most of the interviews were administered, many of the beds seen in the rooms sagged in the middle and did not offer proper support for the back. In addition, fitness levels, fighting, rough play, fatigue due to inadequate amounts of sleep and/or working upwards of twenty days consecutively, or even psychosocial factors may contribute to the development of lower back pain in the farmworkers interviewed.

The methodology of the study may also be flawed. An attempt to randomize the sample by interviewing at three different ends of the camp was made, but most of the ones interviewed worked for one of three different work crews. Since the sample was not random but rather from a collection of workers who predominantly worked for three different crews, the results may not be representative of all the tomato harvesters. There may also be some bias inherent in the questionnaire itself as the symptom surveys were always administered in the same order. Of the people interviewed, a few decided not to answer some questions, particularly in the second part of the symptoms survey. Of the prospective interview subjects, approximately half did not want to be interviewed. One reason for the low cooperation rate was probably due to the length of the interview itself. Although the interview took no longer than 10 to fifteen minutes to administer, many of the subjects interviewed had additional questions concerning their health or about having access to the local migrant health clinic. As a result of the interview's long duration, many observers of the interview quickly scattered and avoided the researchers once the interview was finished. Perhaps by administering the shorter revised questionnaire seen in the appendix, fewer prospective subjects would be intimidated by the interview length.

A major shortcoming of this study was the sample size of 65. Other factors besides the interview length contributed to the small sample size. One reason that more subjects were not interviewed was that the time of the study and the time of actual picking did not coincide. For the first one-and-a-half weeks at the site, very few workers were working. Of the ones who worked, most were interviewed within a few days. Also during that period of time, about 3/4 of the camp's occupants had just arrived from Florida and were in the registration process. It was not until after July 4 that the researchers were able to obtain even enough interview subjects. Another reason for the small sample size was due to the weariness and wariness of the workers. After a long day of hard work in the fields, most of them just wanted to relax or engage in some sort of recreational activity. At times, some farmworkers would think that the study was a front for investigative work conducted by some government agency. Even after the informed consent was fully explained, these workers still expressed doubts. A third reason for the small sample size is the limited time in the evenings allocated for interviews. Generally, the researchers conducted the interviews from six-thirty until nine-thirty in the evenings. Before soliciting subjects for the study,



# **APPENDIX**

## **Data Section**

- I. Original questionnaire with unused questions stricken through
- II. Revised questionnaire for the tomato harvesting population
- III. Revised risk factors checklist with suggestions for additional risk factors

## DATA

Table 1- Race Breakdown of Farmworkers Interviewed

RACE	FREQ	PERCENT
Latino	57	95.0
Black	3	5.0
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

Table 2- Place of Birth of Farmworkers Interviewed

Place of Birth	FREQ	PERCENT
Mexico	46	76.7
Central America	8	13.3
Haiti	3	5.0
United States	2	3.3
Puerto Rico	1	1.7
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

Table 3- Gender Distribution

Gender	FREQ	PERCENT
Male	54	90.0
Female	6	10.0
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

Table 4- Type of work done before arriving at site

Job Description	FREQ	PERCENT
Farmworker	50	83.3
Construction	4	6.7
Cow caretaker	1	1.7
Domestic work	1	1.7
Mining	1	1.7
Restaurant	2	3.3
Truck driver	1	1.7
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

**Table 5-** Responses to question 14:

*"Do you ever have job-related lower back pain?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
YES	29	48.3
NO	29	48.3
DON'T KNOW	2	3.3
<b>TOTAL</b>	<b>60</b>	<b>100.0</b>

**Table 6-** Responses to question 15:

*"Do you ever take breaks due to job-related lower back pain?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
YES	18	56.3
NO	13	40.6
DON'T KNOW	1	3.1
<b>TOTAL</b>	<b>32</b>	<b>100.0</b>

**Table 7-** Responses to question 31: *"What kind of discomfort do you experience in your lower back?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
Pain	25	88.9
Numbness	1	3.7
Inflammation	1	3.7
Ache	1	3.7
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 8-** Responses to question 35: *"What do you think caused the problem?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
Excess work	20	71.4
Work posture	4	14.3
Work environment	1	3.6
Unknown	2	7.1
Kidneys, lungs	1	3.6
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 9-** Responses to question 43: *"Since then, has your lower back problem gotten a lot better, a little better, a little worse, a lot worse, or stayed about the same?"*

<b>RESPONSE</b>	<b>FREQ</b>	<b>PERCENT</b>
A lot better	3	10.7
A little better	3	10.7
About the same	16	57.1
A little worse	4	14.3
A lot worse	2	7.1
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 10-** Responses to question 50: *"Did you become aware of this lower back problem while employed as a farmworker?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
YES	28	100.0
NO	0	0.0
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 11-** Responses to question 51: *"Do you feel this problem was caused by your work as a farmworker?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
YES	27	96.4
NO	1	3.6
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 12-** Responses to question 52: *"Have you ever seen a doctor, nurse, or other health care provider for the problem you've had with your lower back?"*

<b>Response</b>	<b>FREQ</b>	<b>PERCENT</b>
YES	11	39.3
NO	17	60.7
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 12a-** Followup responses to question 52, *"If yes, what was the diagnosis?"*

<b>Diagnosis</b>	<b>FREQ</b>	<b>PERCENT</b>
Given Rx	7	63.6
Excess farmwork	2	18.2
More rest	1	9.1
No Dx	1	9.1
<b>TOTAL</b>	<b>11</b>	<b>100.0</b>

**Table 13-** Responses to question 54: "Do specific activities make this lower back problem worse?"

Response	FREQ	PERCENT
YES	14	50.0
NO	14	50.0
<b>TOTAL</b>	<b>28</b>	<b>100.0</b>

**Table 13a-** Additional responses to question 54: "If yes, specify..."

ACTIVITY	FREQ	PERCENT
Bending over when picking	8	57.1
Lifting basket to shoulder	5	35.7
Walking	1	7.1
<b>TOTAL</b>	<b>14</b>	<b>100.0</b>

**Table 14-** Odds ratio of years worked to incidences of job-related lower back pain

Years Worked	+ Pain	- Pain	Unknown	Odds Ratio
0 to 4	7	11	1	1.00
5 to 9	5	6	0	1.31
10 or more	17	11	1	2.43

$X^2$  linear trend = 2.144  
 $p$ -value = 0.14314

*Note: The numbers in the "- Pain" column does not sum up to 29 because one person did not give how many years he has been a farmworker.*

**Table 15-** The incidence of lower back pain

INCIDENCE	FREQ	PERCENT
Constant	13	48.1
Daily	5	18.5
Once a week	3	11.1
Once a month	2	7.4
Every 2 to 3 months	2	7.4
More than 6 months	2	7.4
<b>TOTAL</b>	<b>27</b>	<b>100.0</b>

Characteristic	Mean	Variance	Std. Dev.	Minimum	25th %ile	Median	75th %ile	Maximum	Mode
Age	32.25	117.004	10.817	18	22	31	39	59	31
Years doing farmwork	11.881	138.899	11.786	0	4	9	17	51	10
Weeks working at site	7.368	70.523	8.398	1	1	4	12	52	12
Days per week worked	5.667	1.718	1.311	2	5	6	7	7	6
Hours per day worked	7.217	4.410	2.100	4	5	8	9	10	8
Breaks per day taken	1.417	2.552	1.598	0	1	1	1	10	1
Duration of break (minutes)	26.358	324.811	18.023	1	10	30	30	60	30

Table A- Work characteristics of the farmworkers interviewed

## LOWER BACK MUSCLE PAIN QUESTIONNAIRE

ID# \_\_\_\_\_

### Part I: Background

1. Date of Birth \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Age \_\_\_\_\_

2. Ethnicity \_\_\_\_\_  
1 = White                      4 = Latino                      7 = Other \_\_\_\_\_  
2 = Black                      5 = Haitian  
3 = Mexican                    6 = Asian

3. Place of Birth \_\_\_\_\_  
1 = United States                      5 = Central America  
2 = Mexico                              6 = South America  
3 = Puerto Rico                      7 = Other \_\_\_\_\_  
4 = Haiti

4. Gender: male (1)    female (2)    unknown (3) \_\_\_\_\_

5. Marital Status \_\_\_\_\_  
1 = never married  
2 = married  
3 = no longer married

6. What type of work did you do before you arrived at this site? \_\_\_\_\_

7. How many years have you been a farmworker? \_\_\_\_\_

8. How many weeks have you been working at this site? \_\_\_\_\_

9. Describe the type of work you do at this site: \_\_\_\_\_

10. How many days per week do you typically work? \_\_\_\_\_

11. How many hours do you typically work per day? \_\_\_\_\_

12. How many breaks do you take per day? \_\_\_\_\_

13. How many minutes are those breaks usually? \_\_\_\_\_

14. Do you ever have job-related lower back pain? \_\_\_\_\_  
1 = Yes                      2 = No                      3 = Don't Know

If YES, continue. If NO, STOP.

15. Do you ever take breaks due to job-related lower back pain? \_\_\_\_\_  
1 = Yes                      2 = No                      3 = Don't Know

16. How many days from work have you missed due to job-related lower back pain? \_\_\_\_\_

I. Original Questionnaire

~~17. How often in the last month have you been mentally exhausted after work?~~ \_\_\_\_\_

- 1 = Never
- 2 = Seldom
- 3 = Often
- 4 = Always

~~18. How often in the last month have you been physically exhausted after work?~~ \_\_\_\_\_

- 1 = Never
- 2 = Seldom
- 3 = Often
- 4 = Always



I. Original Questionnaire

**Part II-- Job-Related Risk Factors to the Back and Lower Extremities**

**Awkward Postures (Repetitive or Static)**

21. Forward or side bending. Mild bending of torso more than 20° but less than 45°. \_\_\_\_\_  
1 = 2 to 4 hours  
2 = 4+ to 8 hours  
8+ hours (Add 0.5 per hour)
22. Severe forward bending of torso more than 45°. \_\_\_\_\_  
2 = 2 to 4 hours  
3 = 4+ to 8 hours  
8+ hours (Add 0.5 per hour)
- ~~23. Backward bending of torso \_\_\_\_\_~~  
~~1 = 2 to 4 hours~~  
~~2 = 4+ to 8 hours~~  
~~8+ hours (Add 0.5 per hour)~~
- ~~24. Twisting torso \_\_\_\_\_~~  
~~2 = 2 to 4 hours~~  
~~3 = 4+ to 8 hours~~  
~~8+ hours (Add 0.5 per hour)~~
25. Kneeling/Squatting \_\_\_\_\_  
2 = 2 to 4 hours  
3 = 4+ to 8 hours  
8+ hours (Add 0.5 per hour)

**Contact Stress**

- ~~26. Hard/sharp objects press into skin \_\_\_\_\_~~  
~~1 = 2 to 4 hours~~  
~~2 = 4+ to 8 hours~~  
~~8+ hours (Add 0.5 per hour)~~

**Push/Pull**

- ~~27. Moderate load \_\_\_\_\_~~  
~~1 = 2 to 4 hours~~  
~~2 = 4+ to 8 hours~~  
~~8+ hours (Add 0.5 per hour)~~
- ~~28. Heavy load \_\_\_\_\_~~  
~~2 = 2 to 4 hours~~  
~~3 = 4+ to 8 hours~~  
~~8+ hours (Add 0.5 per hour)~~

I. Original Questionnaire

**Part III-- Symptoms Survey A**

29. Have you had any pain or discomfort during the last year that you believe to be related to your work?

- 1 = Yes      2 = No      3 = Don't Know  
(If NO, STOP here)

Lower Back

30. Which side bothers you? \_\_\_\_\_

- 1 = Left      2 = Right      3 = Both

31. What kind of discomfort do you experience in your lower back? \_\_\_\_\_

- 1 = Pain  
2 = Numbness/Tingling  
3 = Ache  
4 = Burning  
5 = Swelling  
6 = Stiffness  
7 = Other \_\_\_\_\_

32. In what year did you first notice the problem? \_\_\_\_\_

19 \_\_\_\_\_

33. How long was each episode? \_\_\_\_\_

- 1 = less than 1 hour  
2 = 1 hour to 1 day  
3 = 1 day to 1 week  
4 = 1 week to 1 month  
5 = 1 to 6 months  
6 = more than 6 months

34. How often have you had separate episodes in the last year? \_\_\_\_\_

- 1 = Constant  
2 = Daily  
3 = Once a week  
4 = Once a month  
5 = Every 2 to 3 months  
6 = More than 6 months

35. What do you think caused the problem? \_\_\_\_\_

36. Is this problem interfering with your ability to do your job? \_\_\_\_\_

- 1 = Yes      2 = No      3 = Don't Know

37. According to a scale of 0 to 4 on the bottom, how would you rate this problem right now? \_\_\_\_\_

- 0 = no discomfort  
1 = mild  
2 = moderate  
3 = severe  
4 = unbearable

I. Original Questionnaire

38. How many days of work did you lose in the last year due to this problem? \_\_\_\_\_

39. How many days of light or restricted duty did you have in the last year due to this problem? \_\_\_\_\_

40. Please comment on what you think would improve your symptoms:

I. Original Questionnaire

**Part III-- Symptoms Survey B**

41. In the past year have you experienced any of the following in your lower back? (circle all that apply)

- 1 = pain
- 2 = aching
- 3 = stiffness
- 4 = burning
- 5 = numbness or tingling

42. Please tell me the month and year you first had this lower back problem(s). \_\_\_\_\_/19\_\_\_\_\_

43. Since then, has your lower back problem gotten a lot better, a little better, a little worse, a lot worse, or stayed about the same? \_\_\_\_\_

- 1 = a lot better
- 2 = a little better
- 3 = stayed about the same
- 4 = a little worse
- 5 = a lot worse

44. How often have you had this lower back problem in the past year? \_\_\_\_\_

- 1 = almost never (every 6 months)
- 2 = rarely (every 2-3- months)
- 3 = sometimes (once a month)
- 4 = frequently (once a week)
- 5 = almost always (daily)

45. How long does this lower back problem usually last? \_\_\_\_\_

- 1 = less than 1 hour
- 2 = 1 hour to 1 day
- 3 = more than 1 day to 1 week
- 4 = more than 1 week to 2 weeks
- 5 = more than 2 weeks to 4 weeks
- 6 = more than 1 month to 3 months
- 7 = more than 3 months

46. On average over the past year, would you call this discomfort mild, moderate, severe, or just about the worst discomfort you have ever suffered in your life? \_\_\_\_\_

- 1 = mild discomfort
- 2 = moderate discomfort
- 3 = severe discomfort
- 4 = worst discomfort ever in life

I. Original Questionnaire

~~47. Thinking back to the past 6 months only, how often have you had this lower back problem?~~ \_\_\_\_\_

- 0 = haven't had problem in past 6 months
- 1 = almost never
- 2 = rarely (every 2-3 months)
- 3 = sometimes (once a month)
- 4 = frequently (once a week)
- 5 = almost always (daily)

~~48. Again, over the past 6 months only, how long does this lower back problem usually last?~~ \_\_\_\_\_

- 0 = haven't had problem in past 6 months
- 1 = less than 1 hour
- 2 = 1 hour to 1 day
- 3 = more than 1 day to 1 week
- 4 = more than 1 week to 2 weeks
- 5 = more than 2 weeks to 4 weeks
- 6 = more than 1 month to 3 months
- 7 = more than 3 months

~~49. On average over the past 6 months only, would you call this discomfort mild, moderate, severe, or just about the worst discomfort you have ever suffered in your life?~~ \_\_\_\_\_

- 0 = haven't had problem in past 6 months
- 1 = mild discomfort
- 2 = moderate discomfort
- 3 = severe discomfort
- 4 = worst discomfort ever in life

50. Did you become aware of this lower back problem while employed as a farmworker? \_\_\_\_\_

- 1 = Yes
- 2 = No
- 3 = Don't Know

51. Do you feel this problem was caused by your work as a farmworker? \_\_\_\_\_

- 1 = Yes
- 2 = No
- 3 = Don't Know

52. Have you ever seen a doctor, nurse, or other health care provider for the problem you've had with your lower back? \_\_\_\_\_

- 1 = Yes
- 2 = No
- 3 = Don't Know

If yes, what was the diagnosis? \_\_\_\_\_

53. In the past year, have you missed any days of work because of this problem? \_\_\_\_\_

- 1 = Yes
- 2 = No
- 3 = Don't Know

If yes, How many days in the past year? \_\_\_\_\_

How many days in the past 6 months? \_\_\_\_\_

I. Original Questionnaire

54. Do specific activities make this lower back problem worse? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

If Yes, specify \_\_\_\_\_

55. Have you had to change your job task(s) because of this lower back problem? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

If Yes, probe and describe:

Lower Back Injuries

56. Did you ever have a sudden injury to your lower back as a result of: \_\_\_\_\_

1 = a fall

2 = an object hitting you or falling on you

3 = an auto accident

4 = a sports activity

5 = other sudden injury (specify) \_\_\_\_\_

57. When did this injury occur? (month/year) \_\_\_\_\_ /19 \_\_\_\_\_

58. Did you ever have any lower back problems before this injury occurred? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

If Yes, probe and describe:

59. Do you think your current lower back problem is a result of this injury? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

## LOWER BACK MUSCLE PAIN QUESTIONNAIRE

ID# \_\_\_\_\_

### Part I: Background

1. Date of Birth \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Age \_\_\_\_\_
2. Race \_\_\_\_\_
- |            |                     |
|------------|---------------------|
| 1 = White  | 4 = Asian           |
| 2 = Black  | 5 = Native American |
| 3 = Latino | 6 = Other _____     |
3. Place of Birth \_\_\_\_\_
- |                   |                     |
|-------------------|---------------------|
| 1 = United States | 5 = Central America |
| 2 = Mexico        | 6 = South America   |
| 3 = Puerto Rico   | 7 = Other _____     |
| 4 = Haiti         |                     |
4. Gender: male (1) female (2) \_\_\_\_\_
6. What type of work did you do before you arrived at this site? \_\_\_\_\_
7. How many years have you been a farmworker? \_\_\_\_\_
8. How many weeks have you been working at this site? \_\_\_\_\_
9. Describe the type of work you do at this site: \_\_\_\_\_
10. How many days per week do you typically work? \_\_\_\_\_
11. How many hours do you typically work per day? \_\_\_\_\_
12. How many breaks do you take per day? \_\_\_\_\_
13. How many minutes are those breaks usually? \_\_\_\_\_
14. Do you ever have job-related lower back pain?  
1 = Yes      2 = No      3 = Don't Know  
If YES, continue. If NO, STOP.
15. Do you ever take breaks due to job-related lower back pain?  
1 = Yes      2 = No      3 = Don't Know
16. How many days from work have you missed due to job-related lower back pain? \_\_\_\_\_

**Part II-- Symptoms Survey**

29. Have you had any pain or discomfort during the last year that you believe to be related to your work?

- 1 = Yes      2 = No      3 = Don't Know  
(If NO, STOP here)

Lower Back

31. What kind of discomfort do you experience in your lower back? \_\_\_\_\_

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3 = Ache  
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5 = Swelling  
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7= Other \_\_\_\_\_

32. In what year did you first notice the problem? \_\_\_\_\_

19\_\_\_\_\_

43. Since then, has your lower back problem gotten a lot better, a little better, a little worse, a lot worse, or stayed about the same? \_\_\_\_\_

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3 = Once a week  
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5 = Every 2 to 3 months  
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II. Revised Format

33. How long was each episode? \_\_\_\_\_

1 = less than 1 hour

2 = 1 hour to 1 day

3 = 1 day to 1 week

4 = 1 week to 1 month

5 = 1 to 6 months

6 = more than 6 months

35. What do you think caused your lower back pain?

40. Please comment on what you think would improve your symptoms:

54. Do specific activities make this lower back problem worse? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

If Yes, specify \_\_\_\_\_

55. Have you had to change your job task(s) because of this lower back problem? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

If Yes, probe and describe:

50. Did you become aware of this lower back problem while employed as a farmworker? \_\_\_\_\_

1 = Yes      2 = No      3 = Don't Know

51. Do you feel this problem was caused by your work as a farmworker? \_\_\_\_\_

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52. Have you ever seen a doctor, nurse, or other health care provider for the problem you've had with your lower back? \_\_\_\_\_

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If yes, what was the diagnosis? \_\_\_\_\_

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- 22. Severe forward bending of torso more than 45°. \_\_\_\_\_
  - 2 = 2 to 4 hours
  - 3 = 4+ to 8 hours
  - 8+ hours (Add 0.5 per hour)
- 25. Kneeling/Squatting \_\_\_\_\_
  - 2 = 2 to 4 hours
  - 3 = 4+ to 8 hours
  - 8+ hours (Add 0.5 per hour)

#### Control Over Work Pace

- 1. No control over pace \_\_\_\_\_

*Machine paced, piece rate, constant monitoring, or daily deadlines. Enter 1 if one control factor is present or 2 if two or more control factors are present.*

#### Manual Handling

Additional factors to take into consideration when determining risk factors are:

- 1. Determine if the lift is a near, middle, or far lift
- 2. Estimate the weight lifted and the number of repetitions per shift
- 3. One-handed lifts
- 4. Lifts above the shoulder
- 5. Carrying objects from 10 to 30 feet
- 6. Carrying objects farther than 30 feet
- 7. Lifting while seated or kneeling

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