Estimated Number of Korean Adults with Back Pain and Population-Based Associated Factors of Back Pain: Data from the Fourth Korea National Health and Nutrition Examination Survey

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Objective: We estimated the number of Korean adults with back pain and evaluated population-based associated factors of back pain from a representative sample data from the Fourth Korea National Health and Nutrition Examination Survey.

Methods: The number of Korean adults who experienced back pain (experienced patients), those who experienced back pain lasting for three or more months during the past year (chronic patients), and those who were currently suffering from back pain (current patients) were estimated by analyzing the data from the fourth Korea National Health and Nutrition Examination Survey conducted in 2007 using surveyfreq procedure of the SAS statistical package. Population-based odds ratios for being experienced, chronic, and current patient according to demographic (age and gender), socioeconomic (education and occupation), and lifestyle factors (smoking, drinking, and exercise) were estimated using surveylogistic procedure.

Results: It was estimated that there were 5,554,256 (proportion, 15.4%; 95% CI, 4,809,466 - 6,299,046) experienced patients, 2,060,829 (5.7%; 1,557,413-2,564,246) chronic patients, and 3,084,188 (8.5%; 2,600,197 - 3,568,179) current patients among 36,107,225 Korean adults aged 20-89 years in 2007. Each of explanatory variables was significantly associated with at least one of the response variables for back pain.

Conclusion: Based on our study results, further efforts to investigate epidemiology of back pain, to evaluate associated factors, and to improve treatment outcomes are needed.

KEY WORDS: Back pain - Epidemiology - Population.

INTRODUCTION

Many studies attest to the high frequency of back complaints in any given society. It has been estimated that 70-85% of all people have back pain at some time in life1). Therefore, the economic and public health burden of back disorders and especially low back pain are enormous1). Moreover, as a result of the increasing number of older people throughout the world, the burden on the individual and society as a whole is expected to increase dramatically15).

Dillon et al.2) reported that the 12-month period prevalence of back pain episodes lasting for at least 1 month in the United States was 17.8% (95% CI 16.9%-18.6%) after analyzing the data from the third U.S. National Health and Nutrition Examination Survey conducted between October 1988 and October 1994. Low back pain claims are the most common category of workers’ compensation losses in the United States, accounting for 15-25% of all claims and up to 40% of costs19,20).

Back pain is also becoming a large socioeconomic burden in Korea. Kim et al.6) conducted a study to examine the association between duration of treatment and costs of occupational low back pain in Korea using 9,277 claims from a worker’s compensation database. Duration and costs of claims were skewed, with the 51% of claims less than 6 months accounting for only 10% of costs and the 6% of
claims longer than 2 years accounting for 29% of costs. After 50 months, 418 (4.5%) claims were still open. There have been studies to promote treatment outcomes of patients with back pain7) and evaluate the associated factors of back pain8). However, the exact number of Korean adults with back pain are not known. This study estimated the number of Korean adults with back pain as follows:

**MATERIALS AND METHODS**

The Korea Center for Disease Control and Prevention has conducted the Korea National Health and Nutrition Examination Survey (K-NHANES) on randomly sampled general Korean population to assess health and nutritional statuses through interviews and health examinations. The fourth K-NHANES was scheduled to be conducted from 2007 to 2009 by rounding the whole nation every year without overlapping of survey areas and participants. A multistage stratified probability sampling was applied according to geographical area, gender, and age groups based on the Korea National Statistical Office registries. Individual weight indicating the probability of being sampled was assigned to each participant, enabling the results to represent the entire Korean population. A questionnaire was distributed to the participants to evaluate demographic, socioeconomic, lifestyle, and health status including back pain.

Of the 4,594 Koreans who participated in the fourth K-NHANES, 2,957 adults (aged ≥ 20 yr) responded to the questionnaire of the fourth K-NHANES. We excluded 4 adults aged ≥ 90 yr because of small number but wide age distribution and 24 adults who did not provide important information such as education or occupation. Finally, 2,929 adults remained for analysis.

We used three questions from the questionnaire to estimate the number of Korean adults with back pain as follows:

Q1. Have you ever experienced back pain?
   1) Yes   2) No

Q2. Have you experienced back pain lasting for three or more months during the past year?
   1) Yes   2) No   3) Unrelated (never experienced back pain)

Q3. Are you currently suffering from back pain?
   1) Yes   2) No   3) Unrelated (never experienced back pain)

Those who responded 1) to Q1 were defined as experienced patients, those who responded 1) to Q2 were defined as chronic patients, and those who responded 1) to Q3 were defined as current patients of back pain.

Information on demographic (age and gender), socioeconomic (education and occupation), and lifestyle factors (smoking, drinking, and exercise) was also obtained from the questionnaire. Regarding the smoking, individuals were classified into non-smoker, ex-smoker, and current smoker. Alcohol intake was divided into three groups according to drinking frequency: <1 times per month, 1-4 times per month, and ≥ 2 times per week. Regular exercise was defined as practicing high intensity physical activities (strenuous or gasping activities such as running, high speed cycling, swimming, etc) for at least 20 minutes at one cession and at least 3 days a week; or practicing moderate intensity physical activities (slightly strenuous or gasping activities such as slow swimming, badminton, table tennis, etc) for at least 30 minutes at one cession and at least 5 days a week; or walking for at least 30 minutes at one cession and at least 5 days a week.

The number of experienced, chronic, and current patients in Korean adults were estimated using surveyfreq procedure of the SAS statistical package. Population-based adjusted odds ratio (OR) estimates for being experienced, chronic, and current patient according to demographic, socioeconomic, and lifestyle factors were calculated using surveylogistic procedure8).

**RESULTS**

After analyzing the data from the fourth K-NHANES, it was estimated that there were 5,554,256 (proportion, 15.4%; 95% CI, 4,809,466-6,299,046) experienced patients among 36,107,225 Korean adults aged 20-89 years in 2007. The proportion of experienced patients in females (18.4%) was significantly higher than that in males (12.2%) (p < 0.01). As age increased, the proportion of experienced patients increased (p < 0.01). As education level increased, the proportion of experienced patients reduced (p < 0.01).

Regarding occupation, the proportion of experienced patients was highest in manual workers (19.6%) and lowest in clerks (6.9%). The proportion of experienced patients in non-smokers (16.4%) was higher than ex-smokers (16.2%) and current smokers (12.5%), but statistically insignificant. The proportion of experienced patients in those who never drank or drank less than one time per month (19.6%) was significantly higher than that in those who drank more frequently (p < 0.01). The proportion of experienced patients in those who did not practice regular exercise (16.3%) was higher than that in those who practiced regular exercise.
It was estimated that there were 2,060,829 (5.7%; 1,557,413 - 2,564,246) chronic patients among 36,107,225 Korean adults aged 20-89 years in 2007. The proportion of chronic patients in females (7.3%) was significantly higher than that in males (4.1%) \((p < 0.01)\). As age increased, the proportion of chronic patients increased \((p < 0.01)\). As education level increased, the proportion of chronic patients reduced \((p < 0.01)\). Regarding occupation, the proportion of chronic patients was highest in the unemployed (8.4%) and lowest in clerks (0.1%). The proportion of chronic patients in ex-smokers (6.7%) was higher than non-smokers (5.7%) and current smokers (4.9%), but statistically insignificant. The proportion of chronic patients in those who never drank or drank less than one time per month (7.7%) was significantly higher than that in those who drank more frequently \((p < 0.01)\). The proportion of chronic patients in those who did not practice regular exercise (7.0%) was signi-

### Table 1. Estimated number of Korean adults who experienced back pain based on the data from the fourth Korea National Health and Nutrition Examination Survey (K-NHANES IV)

| Variable | K-NHANES IV | Population |
|----------|-------------|------------|
|          | \(N^a\) | \(n^a\) | \(N^p\) | \(n^p\) | \(\%\) | 95% CI | \(p\) |
| Gender   |            |           |            |            |       |        |       |
| Male     | 1,216 | 157 | 17,716,007 | 2,161,657 | 12.2 | 1,751,997 - 2,571,318 | < .0001 |
| Female   | 1,713 | 327 | 18,391,218 | 3,392,598 | 18.4 | 2,919,507 - 3,865,689 |           |
| Age (yr) |            |           |            |            |       |        |       |
| 20-29    | 310   | 27  | 7,258,092 | 669,718  | 9.2  | 395,965 - 943,472 | < .0001 |
| 30-39    | 621   | 76  | 8,149,850 | 962,072  | 11.8 | 701,557 - 1,222,588 |         |
| 40-49    | 562   | 80  | 8,272,765 | 1,201,538| 14.5 | 900,459 - 1,502,616 |         |
| 50-59    | 502   | 84  | 5,690,846 | 1,027,845| 18.1 | 754,304 - 1,301,387 |         |
| 60-69    | 489   | 110 | 3,725,278 | 916,124  | 24.6 | 710,359 - 1,121,889 |         |
| 70-89    | 445   | 107 | 3,010,395 | 776,958  | 25.8 | 578,560 - 975,355  |         |
| Education (yr) |       |       |            |            |       |        |       |
| \(\leq 6\) | 883  | 179 | 7,160,500 | 1,544,011| 21.6 | 1,219,507 - 1,868,515 | 0.0004 |
| 7-9      | 342   | 59  | 3,759,480 | 568,982  | 15.1 | 396,705 - 741,259  |         |
| 10-12    | 836   | 133 | 11,553,889| 1,735,369| 15.0 | 1,336,752 - 2,133,986|         |
| \(\geq 13\) | 868  | 113 | 13,633,357| 1,705,894| 12.5 | 1,315,169 - 2,096,619|         |
| Occupation |       |       |            |            |       |        |       |
| Professional, manager, and administrator | 332  | 33  | 4,913,419 | 511,582  | 10.4 | 275,736 - 747,429  | 0.0002 |
| Clerk    | 172   | 10  | 2,646,937 | 183,189  | 6.9  | 47,150 - 319,228   |         |
| Sales and service Worker | 311  | 50  | 4,683,306 | 748,763  | 16.0 | 485,387 - 1,012,140|         |
| Agricultural and fishery worker | 243  | 53  | 1,398,731 | 258,923  | 18.5 | 137,168 - 380,677  |         |
| Plant and machine operator | 247  | 30  | 4,266,559 | 478,439  | 11.2 | 294,428 - 662,451  |         |
| Manual worker | 218  | 39  | 2,652,057 | 519,246  | 19.6 | 302,897 - 735,596  |         |
| Unemployed | 1,406 | 269 | 15,546,217| 2,854,113| 18.4 | 2,367,688 - 3,340,537|         |
| Smoking  |       |       |            |            |       |        |       |
| Non-smoker | 1,730 | 303 | 19,310,574| 3,173,765| 16.4 | 2,706,983 - 3,640,546| 0.1269 |
| Ex-smoker | 604   | 101 | 7,574,347 | 1,224,644| 16.2 | 916,025 - 1,534,264|         |
| Current smoker | 595  | 80  | 9,222,303 | 1,155,846| 12.5 | 813,607 - 1,498,086|         |
| Drinking frequency |       |       |            |            |       |        |       |
| \(<1\) time per month | 1,471 | 296 | 15,684,921| 3,081,306| 19.6 | 2,590,294 - 3,572,317| < .0001 |
| \(1-4\) times per month | 880  | 112 | 12,748,475| 1,538,096| 12.1 | 1,177,508 - 1,899,684|         |
| \(\geq 2\) times per week | 578  | 76  | 7,673,829 | 934,854  | 12.2 | 657,683 - 1,212,024|         |
| Regular exercise |       |       |            |            |       |        | 0.3338 |
| Yes      | 1,560 | 242 | 19,367,610| 2,821,981| 14.6 | 2,339,676 - 3,304,285|         |
| No       | 1,369 | 242 | 16,739,615| 2,732,275| 16.3 | 2,174,067 - 3,290,483|         |

\(N^a\): number of the K-NHANES IV participants per individual category, \(n^a\): number of the Korean adults who experienced back pain among the K-NHANES IV participants per individual category, \(N^p\): estimated number of the Korean adults per individual category, \(n^p\): estimated number of the Korean adults per individual category who experienced back pain.
significantly higher than that in those who practiced regular exercise (4.6%) ($p < 0.01$) (Table 2).

It was estimated that there were 3,084,188 (8.5%; 2,600,197-3,568,179) current patients among 36,107,225 Korean adults aged 20-89 years in 2007. The proportion of current patients in females (11.2%) was significantly higher than that in males (5.7%) ($p < 0.01$). As age increased, the proportion of current patients increased ($p < 0.01$). As education level increased, the proportion of current patients reduced ($p < 0.01$). Regarding occupation, the proportion of current patients was highest in agricultural and fishery workers (11.6%) and lowest in clerks (1.9%). The proportion of current patients in non-smokers (9.1%) was higher than ex-smokers (8.7%) and current smokers (7.1%), but statistically insignificant. The proportion of current patients in those who never drank or drank less than one time per month (11.6%) was significantly higher than that in those who drank more frequently ($p < 0.01$).

### Table 2. Estimated number of Korean adults who experienced back pain lasting for three or more months during the past year based on the data from the fourth Korea National Health and Nutrition Examination Survey (K-NHANES IV)

| Variable                                      | K-NHANES IV Population | 95% CI         | $p$  |
|-----------------------------------------------|------------------------|----------------|-----|
|                                               | Na | na | Nb | nb | %  | Lower | Upper |
| Total                                         | 2,929 | 196 | 36,107,225 | 2,060,829 | 5.7 | 1,557,413 | 2,564,246 |
| Gender                                        | 0.0005 |
| Male                                          | 1,216 | 58 | 17,716,007 | 726,482 | 4.1 | 482,592 | 970,373 |
| Female                                        | 1,713 | 138 | 18,391,218 | 1,334,347 | 7.3 | 982,085 | 1,686,609 |
| Age (yr)                                      | < .0001 |
| 20-29                                         | 310 | 8 | 7,258,092 | 175,971 | 2.4 | 48,935 | 303,006 |
| 30-39                                         | 621 | 27 | 8,149,850 | 360,090 | 4.4 | 181,325 | 538,855 |
| 40-49                                         | 562 | 29 | 8,272,765 | 424,461 | 5.1 | 230,935 | 617,988 |
| 50-59                                         | 502 | 30 | 5,690,846 | 336,253 | 5.9 | 189,519 | 482,987 |
| 60-69                                         | 489 | 50 | 3,725,278 | 384,741 | 10.3 | 252,020 | 517,462 |
| 70-89                                         | 445 | 52 | 3,010,395 | 379,314 | 12.6 | 244,678 | 513,949 |
| Education (yr)                                | 0.0002 |
| ≤ 6                                          | 883 | 89 | 7,160,500 | 724,376 | 10.1 | 501,686 | 947,066 |
| 7-9                                          | 342 | 22 | 3,759,480 | 203,488 | 5.4 | 95,996 | 310,980 |
| 10-12                                         | 836 | 45 | 11,563,889 | 556,871 | 4.8 | 318,169 | 795,573 |
| ≥ 13                                         | 868 | 40 | 13,633,357 | 576,094 | 4.2 | 364,309 | 787,879 |
| Occupation                                    | < .0001 |
| Professional, manager, and administrator       | 332 | 9 | 4,913,419 | 154,719 | 3.1 | 39,985 | 269,453 |
| Clerk                                         | 172 | 1 | 2,646,937 | 2,843 | 0.1 | 0 | 8,514 |
| Sales and service Worker                      | 311 | 17 | 4,683,306 | 223,308 | 4.8 | 117,589 | 329,027 |
| Agricultural and fishery worker               | 243 | 21 | 1,398,731 | 81,174 | 5.8 | 23,557 | 138,791 |
| Plant and machine operator                    | 247 | 12 | 4,266,559 | 174,680 | 4.1 | 34,854 | 314,507 |
| Manual worker                                 | 218 | 9 | 2,652,057 | 110,992 | 4.2 | 22,119 | 199,866 |
| Unemployed                                    | 1,406 | 127 | 15,546,217 | 1,313,112 | 8.4 | 962,897 | 1,663,328 |
| Smoking                                       | 0.4746 |
| Non-smoker                                    | 1,730 | 121 | 19,310,574 | 1,104,833 | 5.7 | 800,495 | 1,409,170 |
| Ex-smoker                                     | 604 | 41 | 7,574,347 | 503,818 | 6.7 | 302,306 | 705,330 |
| Current smoker                                | 595 | 34 | 9,222,303 | 452,178 | 4.9 | 258,030 | 646,327 |
| Drinking frequency                            | 0.0008 |
| < 1 time per month                            | 1,471 | 125 | 15,684,921 | 1,208,963 | 7.7 | 879,264 | 1,538,662 |
| 1-4 times per month                           | 880 | 42 | 12,748,475 | 509,779 | 4.0 | 298,183 | 721,375 |
| ≥ 2 times per week                            | 578 | 29 | 7,673,829 | 342,087 | 4.5 | 182,203 | 501,971 |
| Regular exercise                              | 0.0071 |
| Yes                                           | 1,560 | 87 | 19,367,610 | 884,886 | 4.6 | 644,799 | 1,124,972 |
| No                                            | 1,369 | 109 | 16,739,615 | 1,175,944 | 7.0 | 804,298 | 1,547,589 |

**Note:** Na: number of the K-NHANES IV participants per individual category, na: number of the Korean adults who experienced back pain lasting for three or more months during the past year among the K-NHANES IV participants per individual category, Nb: estimated number of the Korean adults per individual category, nb: estimated number of the Korean adults per individual category who experienced back pain lasting for three or more months during the past year.
current patients in those who did not practice regular exercise (10.1%) was significantly higher than that in those who practiced regular exercise (7.2%) \((p < 0.05)\) (Table 3).

Table 4 shows population-based adjusted OR estimates for experiencing back pain (i.e., the risk for being experienced patient) according to demographic, socioeconomic, and lifestyle factors among Korean adults. Women had a 1.82 (95% CI, 1.35-2.46) times higher risk of being experienced patient than men. Adults aged \(\geq 40\) had a higher risk of being experienced patient than those in their 20s; the OR estimates for those in their 40s, 50s, 60s, or \(\geq 70s\) were 1.87 (1.09-3.20), 2.62 (1.53-4.49), 3.77 (2.19-6.51), and 3.94 (2.09-7.42), respectively. Adults with \(\leq 9\) yr of education had a lower risk of being experienced patient than those with \(\geq 13\) yr of education; the OR estimates for those with \(\leq 6\) or 7-9 yr of education were 0.56 (0.38-0.82) and 0.55 (0.36-0.83), respectively. Manual workers had a 1.92 (1.00-3.68) times higher risk of being experienced patient than those in the 40s, 50s, 60s, or \(\geq 70s\).
patient than professionals, managers, and administrators. Those who drank 1-4 times per month had a 0.74 (0.57-0.96) times lower risk of being experienced patient than those who never drank or drank less than one time per month.

Table 5 shows population-based adjusted OR estimates for experiencing back pain lasting for three or more months during the past year (i.e., the risk for being chronic patient) according to demographic, socioeconomic, and lifestyle factors among Korean adults. Women had a 2.37 (95% CI, 1.34-4.31) times higher risk of being chronic patient than men. Adults aged ≥ 40 had a higher risk of being chronic patient than those in their 20s; the OR estimates for those in their 40s, 50s, 60s, or ≥ 70s were 2.72 (1.25-5.90), 2.99 (1.30-6.92), 4.58 (2.08-10.08), and 4.46 (1.65-12.02), respectively. Clerks had a 0.03 (0.00-0.32) times lower risk of being chronic patient than professionals, managers, and administrators. Ex-smokers and current smokers had a higher risk of being chronic patient than non-smokers; OR estimates for ex-smokers or current smokers were 2.39 (1.33-4.31) and 2.18 (1.15-4.12), respectively. Those who did not involve regular exercise had a 1.52 (1.07-2.18) times higher risk of being chronic patient than those who practiced regular exercise.

Table 6 shows population-based adjusted OR estimates for current suffering from back pain (i.e., the risk for being current patient) according to demographic, socioeconomic, and lifestyle factors among Korean adults. Women had a...
2.94 (95% CI, 1.89-4.57) times higher risk of being current patient than men. Adults aged ≥ 30 had a higher risk of being current patient than those in their 20s; the OR estimates for those in their 30s, 40s, 50s, 60s, or ≥ 70s were 2.24 (1.12-4.49), 2.94 (1.37-6.31), 3.86 (1.95-7.67), 6.44 (3.28-12.65), and 5.79 (2.57-13.02), respectively. Adults with less than 13 year of education had a lower risk of being current patient than those with greater or equal to 13 year of education; the OR estimates for those with ≤ 6, 7-9, or 10-12 yr of education were 0.57 (0.34-0.98), 0.54 (0.32-0.92), and 0.57 (0.37-0.88), respectively. Ex-smokers and current smokers had a higher risk of being current patient than non-smokers; OR estimates for ex-smokers or current smokers were 2.01 (1.31-3.09) and 2.03 (1.21-3.41), respectively. Those who did not involve regular exercise had a 1.43 (1.04-1.96) times higher risk of being current patient than those who practiced regular exercise.

**DISCUSSION**

This study revealed useful information on epidemiology of back pain in Korean adults in 2007; over 5 million Korean adults have ever experienced back pain. Of them, over 2 million (37.1%) experienced their back pain progressed to chronic and over 3 million (55.5%) were suffering from back pain at a certain time period.

Caution must be exercised when comparing our results with those of the studies on epidemiology of back pain or back disorders in other countries. Lack of agreement on a clear and potentially acceptable definition of back pain should be considered. In addition, intercultural differences in perceiving or reporting back pain should also be considered. For example, Raspe et al. conducted a survey on national differences in back pain between the United Kingdom and Germany. Past and current back pain was more frequent among German participants and different between East and West Germany. The differences in back pain prevalence could not be explained by less favorable risk profiles among German participants. They concluded that intercultural differences in perceiving or reporting back pain can be hypothesized as the most likely explanation of the markedly different prevalence of the disorder in the United Kingdom and East and West Germany.

Back pain is typically classified as being specific or nonspecific according to the presence of red flags such as spinal fracture, cancer, infection, and cauda equina syndrome. However, the probability that a particular case of back pain has a specific cause identified on back radiographs is known to be less than 1%18. Approximately, 90% cases of back pain have no radiologically identifiable cause and are designated as nonspecific.

Literatures witness that demographic, occupational, and lifestyle factors are associated with nonspecific back pain11. The occurrence of back pain is associated with several demographic factors such as sex, age, and education level16. Studies have shown the association between occupational factors and back pain. Workplace physical loads such as heavy physical work, lifting, bending, twisting, pulling, and pushing have often been associated with back pain9. In addition, psychosocial factors at work (perceived high pressure on time and workload, low job control, job dissatisfaction, monotonous work, and low support from coworkers and management) appear to independently increase the risk of back disorders5. Skillgate et al.14 suggested that smoking

| Variable                          | Estimate | 95% CI  |
|-----------------------------------|----------|---------|
| Gender                            |          |         |
| Male                              | 1.00     |         |
| Female                            | 2.94     | (1.89, 4.57) |
| Age (yr)                          |          |         |
| 20-29                             | 1.00     |         |
| 30-39                             | 2.24     | (1.12, 4.49) |
| 40-49                             | 2.94     | (1.37, 6.31) |
| 50-59                             | 3.86     | (1.95, 7.67) |
| 60-69                             | 6.44     | (3.28, 12.65) |
| 70-89                             | 5.79     | (2.57, 13.02) |
| Education (yr)                    |          |         |
| ≤ 6                               | 0.57     | (0.34, 0.98) |
| 7-9                               | 0.54     | (0.32, 0.92) |
| 10-12                             | 0.57     | (0.37, 0.88) |
| ≥ 13                              | 1.00     |         |
| Occupation                        |          |         |
| Professional, manager, and        | 1.00     |         |
| administrator                     |          |         |
| Clerk                             | 0.49     | (0.11, 2.16) |
| Sales and service worker          | 2.34     | (0.95, 5.75) |
| Agricultural and fishery worker   | 2.42     | (0.99, 5.89) |
| Plant and machine operator        | 1.90     | (0.69, 5.26) |
| Manual worker                     | 1.70     | (0.66, 4.38) |
| Unemployed                        | 2.14     | (0.94, 4.88) |
| Smoking                           |          |         |
| Non-smoker                        | 1.00     |         |
| Ex-smoker                         | 2.01     | (1.31, 3.09) |
| Current smoker                    | 2.03     | (1.21, 3.41) |
| Drinking frequency                |          |         |
| <1 time per month                 | 1.00     |         |
| 1-4 times per month               | 0.70     | (0.48, 1.01) |
| ≥ 2 times per week                | 0.89     | (0.60, 1.32) |
| Regular exercise                  |          |         |
| Yes                                | 1.00     |         |
| No                                | 1.43     | (1.04, 1.96) |
is a risk factor for long-term sick leave due to nonspecific back or neck pain and moderate alcohol consumption tends to have a protective effect. Regular exercise may prevent back pain: 1) it strengthens the back muscles and increases trunk flexibility; 2) increases blood supply to the spine muscles and joints and intervertebral discs; and 3) improves mood and thereby alter the perception of pain.\(^{10,17}\)

Results of this study for the association of demographic, occupational, and lifestyle factors with back pain were generally consistent to those of the previous studies. In this study, however, adults with short duration of education showed a lower risk of being experienced or current patient than those with \(\geq 13\) yr of education. It has been reported that subjects with a low educational level reported substantially more disabling back pain.\(^{13}\) However, inconsistencies remain in the literature over the relative contributions of risk factors to the occurrence of back pain and the causal processes linking education and health are not well known. Occupational exposure and lifestyle factors may intermediate for the causal pathways from education to back pain.\(^{9}\)

**CONCLUSION**

Investigation of the number of patients with concerned disease or illness enables to know the potential medical need in population. It also gives medical providers useful information such as medical facilities, fund, and manpower corresponding to the need. Therefore, further efforts to investigate epidemiology of back pain, to evaluate associated factors, and to improve treatment outcomes are needed.

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