



Contents lists available at ScienceDirect

Safety and Health at Work

journal homepage: www.e-shaw.net

Original Article

Is Educational Level Linked to Unable to Work Due to Ill-health?

Jiyoun Jung¹, Jaesung Choi², Jun-Pyo Myong¹, Hyoung-Ryoul Kim¹, Mo-Yeol Kang^{1,*}

¹ Department of Occupational and Environmental Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea

² Department of Economics, Sungkyunkwan University, Seoul, Republic of Korea



ARTICLE INFO

Article history:

Received 23 April 2019

Received in revised form

27 November 2019

Accepted 26 December 2019

Available online 13 January 2020

Keywords:

Disability

Education

Health inequalities

Workplace

ABSTRACT

Background: This study aimed to examine the association between educational level and unable to work due to ill-health (UWdIH) among 30- to 79-year-old South Koreans.

Methods: A cross-sectional nationwide survey of the 2010–2016 Korea National Health and Nutritional Evaluation Survey was used for analyses. A total of 29,930 participants aged ≥ 30 and < 80 years, who do not have any disability in their daily life because of health problems, were included. Educational level and reason for nonworking are self-reported with multiple choices. Multivariate logistic regression was used to examine an association between education level and UWdIH by setting those who graduated college as their final education ($n = 6,997$) as a baseline while controlling for potential confounding factors.

Results: In the age-stratified result, the ratio of UWdIH was increased as age increases in 3 educational groups ($p < .0001$). There was a tendency that low-level educated [International Standard Classification of Education (0-2)] participants showed higher ratio of UWdIH than high-level educated [International Standard Classification of Education ($5 \leq$)] participants in both sexes (odds ratio: 2.54, 95% confidence interval: 2.12–3.05).

Conclusion: There is a clear link between educational level and UWdIH; the less the educated, the more likely to be UWdIH. Policy priority should be given to plans that can help this vulnerable social group to work and enjoy healthy lives.

© 2020 Occupational Safety and Health Research Institute, Published by Elsevier Korea LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Unable to work due to ill-health (UWdIH) is a shortcut for socially and medically vulnerable populations because UWdIH could lead to lower household income and increased social costs [1,2].

Recent evidence suggests that both health and employment status are closely linked to socioeconomic status, especially educational level. Studies of workers' health status have shown the importance of education as a strong predictor of health even when occupation and income are adjusted [3,4]. Moreover, previous studies have also remarkably shown that workers with higher education are generally less likely to experience ill-health-related labor market outcomes such as sickness absence or disability pension and functional limitation [5–8].

However, in these studies that show education is a key to one's health and unemployment status, a few limitations have been noted. First, the reasons for unemployment status have not been distinguished, which has made it difficult to determine strategy

implementation. Second, there have been no studies that show the age tendency of UWdIH by sex. Third, since most previous studies were based on Western populations and not Asian ones, it has been questioned whether their results can be reliably applied to Asian populations.

Given the known limitations and challenges of the broader body of evidence, the present study aimed to examine not crude unemployment due to various reasons but the specific UWdIH by educational level using nationally representative data of the South Korean population.

2. Methods

2.1. Study population

For this study, we used data from the Korea National Health and Nutritional Evaluation Survey (KNHANES), which are cross-sectional surveys that have been conducted annually since 1998

* Corresponding author. Department of Occupational and Environmental Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, 222, Banpo-daero, Seocho-gu, Seoul, 06591, Republic of Korea. Fax: +82 2 2258 6691.

E-mail address: snaptoon@naver.com (M.-Y. Kang).

by the Korea Centers for Disease Control and Prevention to assess the health and nutritional status of the Korean population. We merged data of the KNHANES from 2010 to 2016.

Of 56,632 participants identified from the KNHANES in 2010–2016, individuals younger than 30 years were excluded, considering the general college graduation age, and those older than 80 years were also excluded from the analysis. Participants experiencing disability in their daily lives because of health problems were also excluded to distinguish whose congenital disorder had influenced their educational level, and missing data for smoking, self-rated health, and household income were also excluded. Thus, we finally included 29,528 eligible participants in this study. After that, we further excluded nonworking population due to reasons other than health problem. The final analyzing sample size and exclusion criteria are presented in Fig. 1. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. This study was approved by the Institutional Review Board of the Korea Centers for Disease Control and Prevention (2010-02CON-21-C, 2011-02CON-06-C, 2012-01EXP-01-2C, 2013-07CON-03-4C, 2014-12EXP-03-5C, 2015-01-02-6C) and Seoul St. Mary's Hospital (ID: KC18ZESI0764) (Fig. 1).

2.2. Measurement

2.2.1. Educational level

Educational level was coded into three categories according to the Korean education system and compared with the 2011 International Standard Classification of Education (ISCED-2011); (i) low (Level 0-2 of ISCED-2011, middle school graduates or less educated in Korean educational program), (ii) intermediate (Level 3, high school graduates), and (iii) high (Level 5A, 5B, 6, college graduates or more educated). ISCED Level 4 was not included because there is no corresponding educational level in Korea because this level represents vocational school.

2.2.2. Unable to work due to ill-health

To assess the cause of unemployed status, 'UWdIH' was operationally defined for our study. While previous literature set outcomes as 'ill-health retirement', 'dismissal on ill-health grounds' or 'disability pension' [5,11,17,19,22], the term UWdIH is distinguishable with those

terms because UWdIH does not guarantee of pension from resigning and sometimes voluntary exit from work. Regarding employment status, interviewees were asked the following question: 'Did you work for more than one hour last week or work for more than 18 hours as an unpaid family worker? A temporary leave of absence is considered to be working'. If the answer was 'No', participants had to move to the next question which asked about the cause of nonworking. This question included seven alternative responses: (i) no need to work, (ii) going to school, (iii) retired, (iv) unable to work due to ill-health, (v) looking for a job, (vi) taking care of the house or family, (vii) and so on. Participants whose response was '(iv) unable to work due to ill-health' were classified as UWdIH, which is the interest group of this study.

2.3. Health-related variables

Participants' smoking status was obtained using one question and was categorized into three groups: nonsmoker, ex-smoker, and current smoker. Self-rated health was measured using a 5-point scale and the following question: 'How is your health in general?' 'Very bad' or 'bad' were regarded as self-rated poor health, whereas 'very good', 'good', or 'fair' were regarded as good health. Other sociodemographic factors including sex and age were also obtained. To account for economic position among the total population, total household income was expressed in quartiles of all KNHANES responders, which were divided into quartiles. Hence, the numbers of each quartile are different in the final analytic sample after applying exclusion criteria.

2.4. Statistical analysis

The sample weights were used in all analyses to produce estimates that were representative of the noninstitutionalized civilian population of Korea. The general and clinical characteristics of the study population were summarized by sex. The proportion of the UWdIH group was presented for each of those characteristics. To investigate the relationship between educational level and UWdIH, we performed multiple logistic regression analysis with the high-level education group as the reference, after excluding nonworking population because of other reasons. For the initial selection of potential variables to be included in the multivariate models, univariate associations were examined, and variables with a significance level of $p < 0.05$ were selected. In multivariate logistic

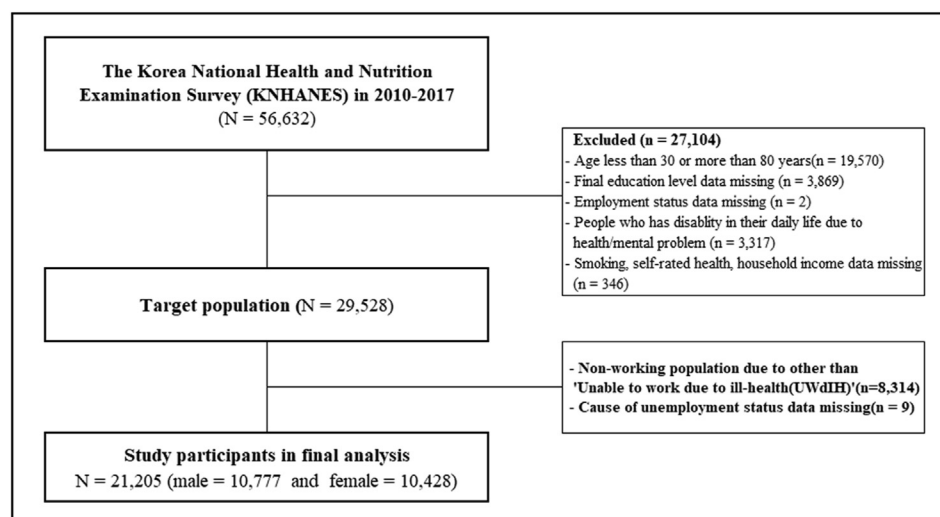


Fig. 1. Schematic diagram of the study participants.

regression analysis, age, smoking history, self-rated health, and total household income were adjusted. Statistical Analysis System (SAS), version 9.4, (SAS Institute, Cary, NC, USA) was used to analyze the data.

3. Results

3.1. Characteristics of study participants

Table 1 presents the sociodemographic characteristics of final participants stratified by sex. Categorical values are presented with the number of participants followed by percentage in brackets. Among the total 10,777 men and 10,428 women, 4.91% of men and 18.63% of women were UWdIH. The mean age of the total participants and the UWdIH group is presented with standard deviation following the ± mark. The proportion of UWdIH decreased as educational level increased; the less educated showed more UWdIH (*p* for trend < .0001). Household income quartile also presented a negative correlation with UWdIH (*p* for trend < .0001). Smoking status was statistically significantly associated with UWdIH in men (*p* < .0001), showing that current smokers formed the largest proportion among UWdIH in men (57.66%).

Fig. 2 provides the percentage of UWdIH by educational level of individuals aged from 30 to 79 years. Overall, we found that the percentage of UWdIH increased with age in all educational level groups. It is clear that the low-level education group showed the highest percentage of UWdIH even in their 30s, followed by intermediate and high-level education group. This tendency is also observed in sex-stratified graphs although the data are noisier because of small sample size of some groups (supplementary Table 1). In addition, the gap between high-level education group and other groups increased by age, while the highly educated group showed a low percentage of UWdIH, even with an increase in age. However, among female participants older than 65 years, intermediate education group indicates the highest percentage of

UWdIH. This is because of the small number of intermediate education group in old female participants while majority of them are in low-level education group. In addition, the high education level of women shows the lowest percentage in the 70–74 age group because there was no UWdIH in this group. Supplementary Table 1 shows a detailed number and percentage of UWdIH by age group (Fig. 2).

The results of the logistic regression analysis are summarized in Table 2. In Model 1, adjusting for age, the odds ratios (ORs) for intermediate education group and low-level education group were 2.52 (95% [confidence interval (CI): 2.07-3.06] and 5.89 (95% CI: 4.89-7.10) for both sexes, respectively. In Model 2, age and smoking habits were adjusted, while age, smoking habit, and self-rated health were adjusted in Model 3. In Model 4, total household income was also adjusted. Statistical significance was observed in each model, although this association between educational level and UWdIH was attenuated after adjustment. The ORs for the low-level education group were 2.68 (95% CI: 2.19-3.28) for both sexes, 2.11 (95% CI: 1.43-3.13 for men, and 1.55 (95% CI: 1.22-1.98) for women. The intermediate education group showed ORs of 1.68 (95% CI: 1.13-2.51) for both sexes, 1.68 (95% CI: 1.13-2.51) and 1.45 (95% CI: 1.12-1.86) for men and women, respectively.

4. Discussion

Taken together, these results suggest that there is a negative association between UWdIH and educational level; the less the educational level, the more likely to be UWdIH. This study aimed to examine the association between educational level and UWdIH among 30- to 79-year-old South Koreans. The main finding of this study was a clear educational gradient in UWdIH risk throughout all age groups. In addition, we found that the high-level education group showed a low rate of UWdIH, even in old ages (Fig. 2). We also observed that the gap between all educational level groups increased by age. The result of this study is consistent with previous

Table 1
Demographic characteristics of participants.

Characteristics	Male (N = 10,777)		Female (N = 10,428)	
	n	UWdIH* n (%)	n	UWdIH* n (%)
Age [†]	50.62 ± 12.59 [†]	66.53 ± 10.04 [†]	52.61 ± 12.86 [†]	64.10 ± 10.82 [†]
30s	2,552	12 (2.27)	1,952	57 (2.93)
40s	2,772	28 (5.29)	2,505	156 (8.03)
50s	2,600	68 (12.85)	2,750	368 (18.94)
60s	1,903	173 (32.7)	1,877	601 (30.93)
70s	950	248 (46.88)	1,344	761 (39.17)
Final education level [‡]				
Middle school graduates or less	2,837	373 (70.51)	4,706	1519 (78.18)
High school graduates	3,524	120 (22.68)	3,141	323 (16.62)
College graduates or more	4,416	36 (6.81)	2,581	101 (5.2)
Smoking [§]				
Current smoker	4,373	305 (57.66)	435	89 (4.58)
Ex-smoker	4,499	159 (30.06)	517	95 (4.89)
Never smoker	1,905	65 (12.29)	9,476	1,759 (90.53)
Self-rated health status [‡]				
Good (very good-good-fair)	9,467	307 (58.03)	8,249	1,106 (56.92)
Poor (bad-very bad)	1,310	222 (41.97)	2,179	837 (43.08)
Household income [‡]				
Q1	1,231	289 (54.63)	2,090	889 (45.75)
Q2	2,686	141 (26.65)	2,695	533 (27.43)
Q3	3,289	61 (11.53)	2,787	317 (16.31)
Q4 (highest)	3,571	38 (7.18)	2,856	204 (10.51)
Total	10,777 (100)	529 (4.91)	10,428 (100)	1,943 (18.63)

UWdIH, unable to work due to ill-health.

* Unable to work due to ill-health.

† average (SD).

‡ *p* < .0001.

§ *p* for trend < .0001.

|| *p* < .0001 in male *p* = 0.411 in female.

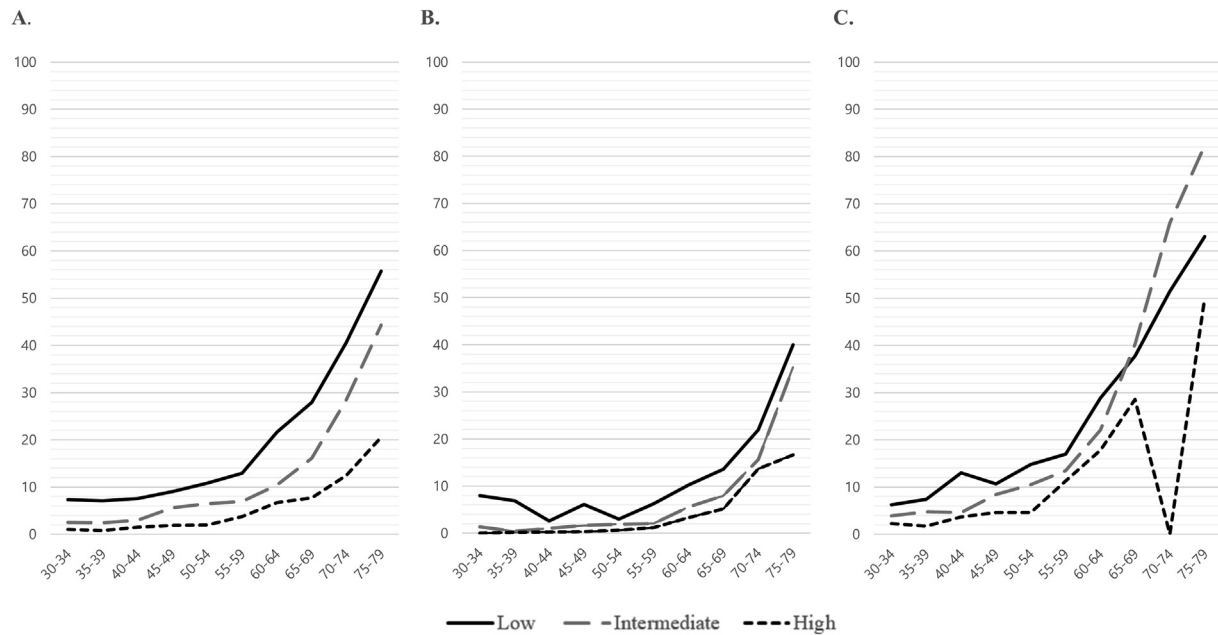


Fig. 2. Percent of unable to work due to ill-health (UWdIH) by age group.

Table 2

Multivariate analysis for the association between education and unable to work due to ill-health (UWdIH).

Final education level	Model 1		Model 2		Model 3		Model 4		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	
Both sex									
High	1.00	ref	1.00	ref	1.00	ref	1.00	ref	
Intermediate	2.21	1.85-2.64	2.12	1.77-2.54	2.07	1.73-2.48	1.90	1.59-2.29	
Low	3.91	3.29-4.65	3.28	2.75-3.91	2.81	2.35-3.36	2.54	2.12-3.05	
Male									
High	1.00	Ref	1.00	Ref	1.00	Ref	1.00	Ref	
Intermediate	2.02	1.45-2.82	1.99	1.42-2.78	1.86	1.33-2.61	1.50	1.06-2.13	
Low	3.42	2.50-4.68	3.35	2.45-4.60	2.88	2.09-3.96	1.86	1.33-2.61	
Female									
High	1.00	ref	1.00	Ref	1.00	Ref	1.00	Ref	
Intermediate	1.68	1.35-2.09	1.67	1.34-2.07	1.67	1.34-2.08	1.55	1.25-1.94	
Low	2.00	1.60-2.49	1.98	1.59-2.47	1.77	1.42-2.22	1.48	1.18-1.87	

Model 1: age adjusted, Model 2: age, smoking adjusted, Model 3: age, smoking, self-rated health adjusted, Model 4: age, smoking, self-rated health, total household income adjusted.

CI, confidence interval; OR, odds ratio.

research, which showed that low educational level is associated with ill-health and occupational difficulties, including unemployment [6,8–19].

The educational gradient in UWdIH can be explained in several ways. One possible explanation is that a high educational level helps workers form and maintain healthy behaviors and make healthier choices as they develop their cognitive ability through education [20]. Moreover, they may have socioeconomic resources for a healthy lifestyle and a greater relative ability to live and work in environments for healthy living [20,21]. On the contrary, a low socioeconomic position and health problems during childhood and youth may follow lower level educational tracks, which, in turn, may influence health through the acquisition or nonacquisition of material and nonmaterial resources and lead to more physically and psychosocially demanding occupations [19].

Another important reason for the difference in UWdIH by educational level might be the weak social and economic safety net in Korea. As provided in Supplementary figure 1, highly educated

participants were more likely to be employed at a young age, while they were not employed after the age of 60 compared with less educated groups. Furthermore, the reason for high-level education groups' nonworking showed quite a different distribution compared with that for the low-level education group's nonworking (Supplementary Figure 2). These results indicate that highly educated participants were unemployed because of reasons other than health problems. In addition, less educated participants tend to stay in the workforce as long as their health status allows them to work. In general, highly educated people exit from the workforce when they have to retire because of age limit after their 60s, regardless of their health status, while less educated people need to work for a living as long as possible because of their poor socioeconomic safety net.

Moreover, it might be related matter of an individual's occupation selection. In addition, a higher rate of UWdIH among people who are less educated might probably be a result of selective forces acting before their entrance in the labor market [22]. Intellectual

ability, psychosocial functioning, and physical abilities manifested relatively early in life, emerging from genetic and social factors, have been shown to have considerable explanatory power regarding this association [23]. Bruusgaard et al. [5] stated that the more the people are educated, the less physically stressful and the more flexible are their jobs. Since education-based work selection leads the less educated to demanding work, people in demanding jobs develop health problems, regardless of the task correlation, and it might thus be challenging to keep working. Thus, people with different educational levels will have different opportunities for continuing to work, according to their working conditions, even if they have similar health status. The results of the present study also showed that even after adjusting for self-rated health status, total household income, and health behavior (smoking), workers with low educational level were more likely to be nonworking because of their health problems. This suggests that low educational level is a strong predictor of social vulnerability, and this socially vulnerable group could be exiled from the workplace, although they can live their daily lives without facing any significant health problems and they perceive their health to be good enough (Supplementary Figure 3). Among the participants reported themselves as in good health status, 8% were in the UWdIH group (not shown in this article). Stratified by education level, the percentage of UWdIH was different in each group. In low-level education group, 18.76% were UWdIH while 4.97%, 1.37% were UWdIH in intermediate-level, high-level education group respectively (supplementary table 2). This might be because education-based work selection leads the less educated to more demanding work and results that low-level education group can be exile from work even when workers think themselves good enough to live their daily life with subjective fair health status. Therefore, the high rate of UWdIH can be interpreted as there being a high health threshold to be economically active in the labor market in Korea. Thus, although people might have a strong motivation to be in the workforce, the high health threshold can be an obstacle.

An important issue that stems from this discussion is the gender difference in the relationship between education and UWdIH. In the logistic regression model, female participants showed a smaller gap in ORs for UWdIH by educational level. This might be because women are more likely to exit from the labor market than men with low health thresholds, regardless of their educational level in Korea. In addition, the percentage of elderly women in the high-level education group is much smaller than that of male counterparts (Supplementary Figure 4).

The strength of this study is that we focused on UWdIH while previous studies have not specifically examined participants who exit the workforce because of health problems. This study confirms that low educational level is associated with participants' nonworking because of ill-health. Compared with the previous literature, another significant feature of this study is that it excluded participants who experienced disability in their daily lives due to health problems from the analysis. Thus, the UWdIH group of our study only included people who experienced ill-health-related nonworking, although they could live their daily lives without considerable health problems. The present study, however, has several limitations that need to be considered. First, owing to its cross-sectional design, we could not identify the direction of the causal relationship between educational level and UWdIH. To eliminate the effect of UWdIH on educational level, only participants who are older than 30 years were included in our study. In addition, age effect and cohort effect might be mixed because the educational level of the cohort was strongly influenced by the compulsory national education system (Supplementary Figure 4). Second, although we adjusted for age, smoking history, self-rated health, and total household income, other factors that were not

controlled in this study (such as residential area, occupational history, or change in social benefits over time) may have an effect on the associations. For example, those who live in a city or near industrial region may have much more opportunities to get a job than the others. Therefore, these unexplained parts remain to be investigated in future studies. Third, the findings of this study are based on samples from Korea. Because the association found in this study could depend on cultural aspects or the social welfare system in Korea, the generalizability of our findings to other countries remains to be confirmed.

5. Conclusion

The results of the present study showed a clear educational gradient in UWdIH risk throughout all age groups. That is, lower education groups are more likely to experience a higher UWdIH risk. A gender difference was also observed as women showed a smaller gap by educational level. Low educational level is closely associated with UWdIH, even for potential workers who can live their daily lives without any considerable health problems and who perceive their health as good enough. Therefore, a policy priority should be given to plans that can help this vulnerable social group to work and enjoy healthy lives.

Disclaimers

Not applicable.

Patient consent

Patient consent was obtained.

Ethics approval

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All study participants provided informed consent. This study was approved by the Institutional Review Board of the Korea Centers for Disease Control and Prevention (2010-02CON-21-C, 2011-02CON-06-C, 2012-01EXP-01-2C, 2013-07CON-03-4C, 2014-12EXP-03-5C, 2015-01-02-6C) and Seoul St. Mary's Hospital (ID: KC18ZESI0764).

Data sharing statement

Details of the Korea National Health and Nutritional Evaluation Survey are available on the survey's website (<https://knhanes.cdc.go.kr/knhanes/eng/index.do>).

Funding

This work by Jaesung Choi was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea [NRF-2016S1A3A2925085].

Conflicts of interest

None declared.

Acknowledgments

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2019.12.010>.

References

- [1] Artazcoz L, Benach J, Borrell C, Cortès I. Unemployment and mental health: understanding the interactions among gender, family roles, and social class. *Am J Public Health* 2004;94:82–8.
- [2] Farber HS. What do we know about job loss in the United States? Evidence from the Displaced Workers Survey, 1984–2004. *Econ Perspect* 2005;29:13–28.
- [3] Lahelma E. Health and social stratification. In: Cockerham WC, editor. *The blackwell companion to medical sociology*. Malden, MA: Blackwell Publishers; 2007. p. 64–93.
- [4] Ross CE, Wu C-I. The links between education and health. *Am Sociol Rev* 1995;60:719–45.
- [5] Bruusgaard D, Smeby L, Claussen B. Education and disability pension: a stronger association than previously found. *Scand J Public Health* 2010;38:686–90.
- [6] Christensen KB, Labriola M, Lund T, Kivimäki M. Explaining the social gradient in long-term sickness absence: a prospective study of Danish employees. *J Epidemiol Community Health* 2008;62:181–3.
- [7] Hansen H-T, Ingebrigtsen T. Social class and sickness absence in Norway. *Acta Sociol* 2008;51:309–27.
- [8] von dem Knesebeck O, Verde PE, Dragano N. Education and health in 22 European countries. *Soc Sci Med* 2006;63:1344–51.
- [9] Haukenes I, Mykletun A, Knudsen AK, Hansen HT, Maeland JG. Disability pension by occupational class—the impact of work-related factors: the Hordaland Health Study Cohort. *BMC Public Health* 2011;11:406.
- [10] Huisman M, Kunst AE, Bopp M, et al. Educational inequalities in cause-specific mortality in middle-aged and older men and women in eight western European populations. *Lancet* 2005;365:493–500.
- [11] Johansson E, Leijon O, Falkstedt D, Farah A, Hemmingsson T. Educational differences in disability pension among Swedish middle-aged men: role of factors in late adolescence and work characteristics in adulthood. *J Epidemiol Community Health* 2012;66:901–7.
- [12] Kaikkonen R, Härkänen T, Rahkonen O, Gould R, Koskinen S. Explaining educational differences in sickness absence: a population-based follow-up study. *Scand J Work Environ Health* 2015;41:338–46.
- [13] Kim JH, Noh J, Choi JW, Park EC. Association of education and smoking status on risk of diabetes mellitus: a population-based nationwide cross-sectional study. *Int J Environ Res Public Health* 2017;14:655.
- [14] Laaksonen M, Rantala J, Järnefelt N, Kannisto J. Educational differences in years of working life lost due to disability retirement. *Eur J Public Health* 2018;28:264–8.
- [15] Manor O, Eisenbach Z, Friedlander Y, Kark JD. Educational differentials in mortality from cardiovascular disease among men and women: the Israel Longitudinal Mortality Study. *Ann Epidemiol* 2004;14:453–60.
- [16] North F, Syme SL, Feeney A, Head J, Shipley MJ, Marmot MG. Explaining socioeconomic differences in sickness absence: the Whitehall II Study. *BMJ* 1993;306:361–6.
- [17] Polvinen A, Laaksonen M, Gould R, Lahelma E, Leinonen T, Martikainen P. Socioeconomic differences in cause-specific disability retirement in Finland, 1988 to 2009. *J Occup Environ Med* 2016;58:840–5.
- [18] Schuring M, Robroek SJ, Lingsma HF, Burdorf A. Educational differences in trajectories of self-rated health before, during, and after entering or leaving paid employment in the European workforce. *Scand J Work Environ Health* 2015;41:441–50.
- [19] Sumanen H, Rahkonen O, Pietiläinen O, Lahelma E, Roos E, Lahti J. Educational differences in disability retirement among young employees in Helsinki, Finland. *Eur J Public Health* 2016;26:318–22.
- [20] Cutler DM, Lleras-Muney A. Understanding differences in health behaviors by education. *J Health Econ* 2010;29:1–28.
- [21] Brownell KD, Kersh R, Ludwig DS, et al. Personal responsibility and obesity: a constructive approach to a controversial issue. *Health Aff (Millwood)* 2010;29:379–87.
- [22] Falkstedt D, Backhans M, Lundin A, Allebeck P, Hemmingsson T. Do working conditions explain the increased risks of disability pension among men and women with low education? A follow-up of Swedish cohorts. *Scand J Work Environ Health* 2014;40:483–92.
- [23] Gravseth HM, Bjerkedal T, Irgens LM, Aalen OO, Selmer R, Kristensen P. Influence of physical, mental and intellectual development on disability in young Norwegian men. *Eur J Public Health* 2008;18:650–5.