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Personal Characteristics Associated with Working after Disability Onset

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Abstract

Introduction: This study utilized data from the 2014 Survey of Disability and Employment (SDE) to examine personal characteristics that influenced employment after disability onset for people who are blind or have low vision.

Method: The selected sample from the SDE dataset included 131 individuals who are blind or have low vision, had disability onset after age 14 years, and worked before their disability onset. Logistic regression was used to examine working after disability onset associated with age at disability onset, years since disability onset, gender, race, education, receipt of government disability benefits, self-reported health, encouragement received to work, additional disabilities, and the interaction between age at disability onset and years since disability onset.

Results: Persons who were female, received government benefits, and had multiple disabilities were less likely to work after disability onset; persons who had more sources of encouragement were more likely to work after disability onset. Age at disability onset interacted with time since disability onset; as age increased, odds of working after disability onset increased but only for persons who had their disability for at least four years.

Discussion: Persons with newly acquired disabilities may need time to adjust to their disability and learn new skills that allow them to continue employment. Information about how employment may influence receipt of government benefits would be helpful to persons evaluating their options regarding continuing employment.

Implications for Practitioners: People who have not worked after recent disability onset may be adjusting to life with a disability and may return to work in the future. Encouragement to work from both service providers and family members made a meaningful difference in

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employment retention after disability onset, and this is an area that VR professionals can influence.

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Personal Characteristics Associated with Employment Retention after Disability Onset

Persons who are blind or have low vision continue to be employed at levels below their sighted peers (McDonnall & Sui, 2019). State-federal vocational rehabilitation (VR) programs assist persons with vision loss in obtaining, retaining, or regaining employment. Previous studies have found that almost one-third of persons with vision loss applying for VR services are employed (Crudden, Giesen, & Sui, 2018). It is generally regarded as better for the person with vision loss and easier for the VR provider to assist a person in retaining employment rather than helping them find or regain a job. Consequently, investigation into issues associated with promoting employment retention is important for both persons with vision loss and their service providers. Additionally, the passage of the Workforce Innovation and Opportunity Act (WIOA) contained language making job retention a priority, thus renewing attention to this important VR service. This study using secondary data from the 2014 Survey of Disability and Employment (SDE) is the first to examine how age at onset of disability and time since onset of disability influenced job retention of persons with vision loss.

The decision to stop working because of a disability can influence income, the potential of living in poverty (Wu & Hyde, 2019), and life satisfaction (Moore, et al., 2011). This makes employment retention after disability an important issue for investigation. Most of the research concerning age of disability onset and employment has focused on persons with various disabilities rather than targeting persons with vision loss. For example, Loprest and Maag (2003) used data from the 1994 and 1995 National Health Interview Survey – Disability Supplement to determine that persons with early onset of disability were more likely to be employed than persons with later disability onset even when controlling for receipt of disability benefits and other factors. However, an analysis of the Kessler Foundation National Employment and

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Disability Survey found that persons who acquired their disability as adults were more likely to be working than those who acquired their disability before age 18 years (Sundar, et al., 2018).

An Australian study found that education and vocational qualifications were more influential on employment than age at disability onset (Polidano & Vu, 2015). A study of 2,650 VR program participants at case closure found that older participants and those who had their disability for longer periods of time were more likely to be successfully rehabilitated, though disability type had more influence on employment outcomes (Xu & Martz, 2009). These studies indicate that we have much to learn about how age at onset of disability and length of time from disability onset may influence whether a person continues to work.

A few studies have examined age of vision loss and its association with employment. For example, in an electronic survey of volunteers, persons born blind or visually impaired or persons who acquired vision loss shortly after birth were more likely to be employed than persons who lost their vision after two years of age (Bell & Silverman, 2018). In a study of middle-aged adults who received vision rehabilitation services in New York and sustained vision loss after age 18 years, the participants reported difficulty retaining employment due to vision loss; those with more recent onset of visual disability expressed greater concern about managing activities of daily living, while persons with earlier onset of vision loss were more focused on other life goals, such as their careers (Popivker, Wang, & Boerner, 2010). Bruce & Baker (2005) conducted a study in the United Kingdom and found that among unemployed persons who were blind or partially sighted and who lost their vision less than two years ago, none were interested in working; however, if their vision loss occurred three or more years ago, 22% wanted to return to work. Additionally, most of the unemployed in that study who categorized themselves as retired regretted having done so (Bruce & Baker, 2005).

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While not directly examining age at onset of disability, studies about the age at which a person seeks VR services found that odds of competitive employment decreased as age at application increased for consumers receiving Social Security Disability Insurance (SSDI) benefits, though persons applying for VR services in their mid-thirties or older were more likely to be employed if served by state VR agencies which serve visually impaired persons exclusively, rather than VR agencies which serve persons with various types of disabilities (Giesen & Lang, 2018). This corresponds to an analysis based on more recent data from the Rehabilitation Services Administration in the fiscal year 2015, which found that older applicants with vision impairments more likely to be employed than younger applicants (Crudden, Giesen, and Sui, 2018).

The lack of more extensive research concerning how age at onset of visual impairment and time since onset of disability impact employment is likely influenced by the absence of certain variables in datasets. For example, the Rehabilitation Services Administration case service dataset, which is widely used to explore disability and employment, does not include this information (RSA, 2013). Additionally, despite the notable differences in the service needs of persons with hearing and vision loss, researchers sometimes combine hearing and vision loss into one category as a “sensory impairment” (Chan, et al., 2014; Rosenthal, et al., 2005), making it difficult to discern how age of onset of vision loss impacts employment.

Purpose and Research Questions

Given the lack of research on job retention, particularly lack of research on the association among employment, age at disability onset, and years since disability onset, this study examined the following research questions:

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1. Regarding people who are blind or have low vision, how are personal characteristics associated with continued employment after disability onset?
2. How did age at disability onset and years since disability onset influence employment after disability for people who are blind or have low vision?

Method

Data source and study sample

Data for this study is from the 2014 Survey of Disability and Employment (SDE) conducted by Mathematica Policy Research. The SDE program targeted persons 25 to 60 years old who applied for VR services in three state agencies between August 15 and December 15, 2014 (Eckstein, Sevak, & Wright, 2017; Jaszczak et al., 2015). The New Jersey Division of Vocational Rehabilitation Services, the Mississippi Department of Rehabilitation Services, and Opportunities for Ohioans with Disabilities participated in the SDE with endorsement from the Rehabilitation Services Administration (RSA) and the Council of State Administrators of Vocational Rehabilitation (CSAVR). Survey design and preliminary findings of the SDE dataset can be found in a recent publication by Eckstein, Sevak, and Wright (2017).

We obtained the SDE dataset from the Kessler Foundation and the dataset included 2,804 individuals (Eckstein, Sevak, & Wright, 2017; Jaszczak et al., 2015). Our study sample was based on the following criteria: persons who (1) are blind or have low vision (B/LV), (2) worked before their disability onset, and (3) had disability onset at 15 years of age or older. The selected sample included 131 individuals. Sampling weights were assigned by the inverse of the probability of selection and adjusted by nonresponses (Jaszczak et al., 2015). The SDE dataset includes a weight variable for calculating statistics standardized to a pseudo-population, so the selected sample can be generalized to the national VR population to represent 322 VR

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applicants. All statistical analyses were based on the sample with weights applied. The sample includes 20% of respondents who are blind, and 80% who are visually impaired. The average age of the sample was 48.9 years ($SD = 9.1$) ranging from 26 to 60. Males accounted for 54.4% of the sample. The majority were White (51.3%), followed by 44.5% African American, 2.2% Asian, and 2.0% multiple races. More than half (58.1%) of the applicants had one or more disabilities in addition to blindness or low. Three quarters (75.8%) received encouragement to work from a friend, a spouse, a family member, and/or a professional. The average age at disability onset was 40 years ($SD = 11.8$) ranging from 15 to 60.

Variables

The dependent variable differentiated those who worked and those who did not work after disability onset. The dichotomous dependent variable was coded as 1 if the person worked after disability onset, and 0 if the person did not work after disability onset. Independent variables consisted of gender (0 = male; 1 = female), race (1 = White; 0 = other races), education, age at disability onset, years since disability onset, self-reported physical health, receipt of government benefits such as Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI), encouragement received to work, and additional disabilities. Education was categorized into three levels: (a) less than high school; (b) high school graduate, some post-secondary, associate degree or certificate/license (the reference category); and (c) Bachelor's degree or above. Age at disability onset and years since disability onset were both continuous variables. Self-reported physical health was coded as 1 if individuals responded "excellent", "very good", or "good" to the question "In general, would you say your physical health is...?", and coded as 0 if people responded "fair" or "poor". If individuals "currently received government disability benefits such as SSI or SSDI," the variable government benefits

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was coded 1; otherwise, it was coded 0. Three quarters (75.8%) received encouragement to work from (a) a friend, (b) a spouse, (c) a family member, and (d) a professional (such as a counselor or care provider). Encouragement to work was recoded as a continuous variable. A few individuals who reported “not applicable” to all the above four sources of encouragement to work were coded as 0. Additional disability was also coded as a continuous variable indicating the number of additional disabilities that the person had other than blindness or low vision, including 68.8% with physical problems, 42.8% with mobility limitations, 18.2% with psychiatric issues, and 18.2% with deafness or hearing impairment. The values of both continuous variables “encouragement received to work” and “additional disabilities” ranged from 0 to 4.

Data analysis

Data analyses were conducted using SAS 9.4 to address the research questions. Descriptive statistics were used to examine the characteristics between persons who worked after disability onset and persons who did not work after disability onset. Logistic regression was utilized to evaluate differences between the two groups based on personal characteristics. Multicollinearity (two or more explanatory variables that are highly linearly related) was screened by running variance inflation factors (VIFs) for each of the explanatory variables. No difficulties regarding multicollinearity were found. Due to our interest in the effect of age at disability onset, our intermediate logistic regression models tested a set of interaction terms between age at disability onset and other independent variables. Among these intermediate models, three interactions (age at disability onset by gender, education, and years since onset) were significant, but models showed lack of fit based on the Hosmer and Lemeshow test if age at disability onset by gender and age at disability onset by education were included. Therefore, the final model only

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included the interaction between age at disability onset and years since disability onset. Sampling weights were applied in all the statistical analyses.

Results

Descriptive Statistics

Our weighted sample represented 322 VR applicants who had a work history before disability occurred. After disability onset, three-quarters (74.8%, $n = 241$) continued to work and a quarter (25.2%, $n = 81$) did not. For the overall sample, nearly 10% had less than a high school education; almost one-fifth had a Bachelor's or above degree. Educational levels were similar for those who continued working and those who stopped working after disability onset. Lower percentages of females, non-Whites, and recipients of government disability benefits worked after disability onset compared with male, White race, and those who did not receive government disability benefits. A higher percentage of individuals who reported their health as being good, very good, or excellent worked after disability onset. Individuals who worked after disability onset had more sources of encouragement to work and fewer additional disabilities. Among those who continued working, 50.1% had additional disabilities; among those who stopped working, 81.6% had additional disabilities. Descriptive statistics for the overall sample for both employment groups are in Table 1.

Logistic Regression Model

Logistic regression with sampling weights was utilized to evaluate differences between the individuals who continued to work and who did not work after disability onset. The Hosmer and Lemeshow test was not significant, $\chi^2(8, N = 322) = 6.44, p = 0.60$, indicating that predicted and observed event rates were well calibrated. The likelihood ratio test was significant, $\chi^2(11, N$

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$= 322) = 173.01, p < .001$ and the model explained 78.2% (Nagelkerke R^2) of the total variance of the dependent variable.

Table 2 displays the estimates, standard errors, degrees of freedom, Wald χ^2 , odds ratios (OR), observed significance level (p), and 95% confidence intervals of odds ratios from the logistic regression model. If a significant independent variable had a positive estimate and $OR > 1$, the variable had a significant positive association with working after disability onset. If a significant variable had a negative estimate and $OR < 1$, the variable had a significant negative association with working after disability onset. For females, the odds of continuing employment after disability onset were about 69% lower than for males, which equates to odds more than 3 times greater for males to work after disability onset. Persons who received a government benefit, such as SSI or SSDI, had 98% lower odds of continuing to work than those who did not receive the benefit, which equates to odds of working after disability onset more than 52 times higher for those who do not receive government benefits. For each additional disability reported, the odds of retaining employment decreased by 50%. The odds of working increased by 97% if a person received encouragement to work from an additional source. For a person who had one source of encouragement to work, their odds of working were 2 times greater than for those without any encouragement; these odds increased to 15 times greater for someone with four sources of encouragement. In summary, being female, receiving government disability benefits, and having additional disabilities were associated with lack of employment after disability onset; however, receiving more encouragement to work was associated with continuing to work after disability onset.

Moreover, the odds of employment after disability onset were significantly affected by the interaction between age of disability onset and years since disability. With increasing age at

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disability onset, greater years since disability onset was associated with higher odds of continuing to work. At earlier ages of onset, this relationship existed but was not as strong as later ages of disability onset. For example, the odds of retaining employment after disability onset increased 10.3% if the age of disability onset was at 20 years old, but the odds increased to 57.2% if the onset age was at 50 years old. Figure 1 presents the odds ratio of working based on the interaction between age at disability onset and years since disability onset. If the confidence interval of the odds ratio included 1, then the interaction was not significant. In other words, Figure 1 indicates that if the applicant had a disability onset of less than four years ago, age at disability onset was not significantly associated with continued work. In other words, for the first three years after disability onset, the age of disability onset is not associated with whether a person will continue working.

Discussion

This is the first study to evaluate the likelihood of continued employment among people who are blind or have low vision when considering their age at onset of a disability and the length of time since their disability was acquired. Approximately 58% of the total sample reported having one or more disabilities, in addition to their vision-related disability. When reporting age at onset of disability, the respondents with multiple disabilities may have been referring to their vision impairment or to another disability. Nevertheless, the relation of age at onset of disability and time since disability onset are essential factors to investigate when considering employment outcomes. Our sample includes only persons with a work history before disability and therefore excludes those who acquired their disability at a young age. It yields important information about employment status after disability concerning the age that disability was acquired and how long the person has had the disability.

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Age at disability onset was not associated with employment among VR applicants who had their disability less than four years. This means that if a person acquired a disability in recent years, age of onset was not a factor in whether or not a person retained employment. However, as the time from disability onset increased to four years or longer, the likelihood of employment retention increased as their age at onset increased. Less than half of the sample (41.3%) had a recent onset (less than four years), and almost three-quarters of those with recent onset (73.4%) worked after acquiring a disability. Almost one-third of the sample (29.8%) had a disability for over 10 years, and a higher percentage of those VR applicants were working (83.6%). When we compared those who did not work and those who did work after disability onset, the average time since acquiring a disability was 7.1 years and 9.5 years, respectively. Potentially, people who did not work after disability onset were adjusting to life with a disability and may return to work in the future. During that period, persons with more recent onset of disability may be learning new skills and coping with various emotional and practical changes associated with acquiring a disability. Persons who continued to work may have been in jobs where it was easier to make workplace accommodations or where the employers were more receptive to making such accommodations, although our data do not allow us to determine if the person continued in the same job they held before disability onset or obtained a different job later.

Receipt of government benefits (SSI or SSDI) was the strongest predictor of stopping work after disability. The odds of retaining employment for those receiving government benefits were reduced 98.1%. In other words, people who received government benefits were 52.6 times more likely to stop working after disability onset. The presence of multiple disabilities was also more prevalent among persons who received government benefits. The more disabilities a person had, the greater the likelihood of not working after disability onset. In this sample, among those

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who worked after disability onset, 18.3% received government benefits and 50.1% had additional disabilities, 17.8% with mobility limitations, 11.6% with psychiatric issues, and 9.7% with hearing impairment. Among those who did not work after disability onset, 70.5% received government benefits and 81.6% had additional disabilities—51.4% with physical problems, 44.6% with mobility limitations, 12.9% with hearing impairments, 10.0% with psychiatric issues, and 8.4% with intellectual disabilities. We do not know how the severity of the disabilities may have influenced the decision to receive government benefits. Several studies have found that receipt of government benefits and the presence of multiple disabilities have a negative impact on competitive employment among vocational rehabilitation participants with visual impairments (Lund & Cmar, 2019a). Persons who receive government benefits with additional disabilities may need more extensive services and supports to remain employed. These findings suggest the importance of providing benefits counseling to VR applicants who receive government disability benefits. Each individual must be informed about strategies to maximize their long and short-term earning capacity while accommodating their health concerns so that they can accurately assess employment options. However, when persons leave the labor market early and rely on government benefits, their long-term financial security and economic independence are jeopardized. Consequently, every effort should be made to support employment rather than reliance on government benefits.

Benefits counseling to assist persons in evaluating the advantages of continued work may be helpful to persons who leave the labor market or are considering leaving it. Persons can be employed and continue to receive SSDI if their earnings are below a specified threshold, and that threshold is higher for persons who are blind (\$2,040/month) than for those who have other disabilities (\$1,220/month) (Social Security, 2019). Additionally, resources and information are

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available to support employment for persons receiving SSI and SSDI (Social Security, 2019). For example, Medicare coverage can be extended for eligible persons receiving SSI and SSDI, expenses associated disability can be deducted from earned income calculations for SSI and SSDI, and SSI and SSDI payments can continue while participating in VR programs. Navigating the sometimes complex network of government support systems, including the VR program, may lead some persons to retire earlier than they planned, thus putting them at economic risk in subsequent years.

Receiving encouragement for work from others was also an important predictor of employment after disability onset. The four categories of people who potentially provided encouragement in this study were friends, spouse, family members, and professionals. Of those who continued to work, 61.1% received encouragement from a friend, 72.2% from a spouse or a family member, and 43.5% from a professional. The greater the number of members from these groups providing encouragement to work, the more likely that the person would be employed after disability onset. This finding is particularly important for VR professionals, as it is an area that they can directly influence. This study documents that providing support and encouragement for employment efforts can be beneficial. VR professionals can also urge family members to provide such encouragement. Combining this support with education about government programs that support employment, may provide the impetus for persons with disabilities to learn adaptive skills that can assist them in staying employed.

Gender was also associated with employment, with females being less likely to continue working after disability, consistent with previous research (Lund & Cmar, 2019a). Service providers should be aware that women are at greater risk of leaving the job market after disability onset and thus may benefit from additional services and supports. Since women

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typically live longer than men, early exit from the labor force puts them at even greater risk of living their senior years in poverty.

Two personal characteristics that have typically been associated with employment for this population were not significant predictors in this study – education level and health (Lund & Cmar, 2019b). Both approached but did not reach significance, perhaps overshadowed by the large effect of disability benefit receipt. This brings to attention one of the limitations of this study: sample size. The small sample size resulted in a low power to find small effects in the logistic regression model. Given the small sample size, these results should be confirmed with a larger sample. Other limitations include our inability, due to the available dataset, to determine age at onset of visual disability, how much vision remained, and the lack of details about individual work history. We could not determine how much or how long a person worked after disability onset, if a person attempted to work after disability and was unsuccessful in retaining their job or finding alternate employment, or if a person stopped working and then returned to employment in the future.

Conclusions

This study found that persons who were not working after disability onset tended to be female, received government benefits, and had multiple disabilities, while persons who worked after disability onset had more sources of encouragement to work. Older age at disability onset was associated with greater odds of working after disability onset for persons who had their disability at least four years. For those with onset less than four years ago, age at onset did not matter, suggesting that an adjustment period may be necessary regardless of age of disability onset. Interventions that provide information about the services to support continued employment appear indicated, particularly for persons receiving government benefits, those with

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additional disabilities, and women. Furthermore, encouragement to work from both service providers and others connected to the person with a disability appears to make a meaningful difference in employment after disability onset.

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Table 1

Descriptive statistics for predictors by group

Variables	Overall	Worked after disability onset	Did not work after disability onset
Age at disability onset (<i>M</i>)	40.0 (11.8)	39.9 (12.0)	40.1 (11.2)
Years since disability onset (<i>M</i>)	8.9 (9.5)	9.5 (10.0)	7.1 (7.6)
Female	45.6	39.5	63.5
White	52.5	54.4	46.8
Education			
Less than high school	10.9	10.8	11.3
High school graduate, post-secondary education, associate degree, vocational certificate	70.0	69.7	70.8
Bachelor's degree or above	19.1	19.5	17.9
Receipt of government disability benefit	31.4	18.3	70.5
Health			
Excellent/Very good/Good	59.1	63.9	44.6
Fair/Poor	40.9	36.1	55.4
Encouragement to work (<i>M</i>)	1.9 (1.4)	2.1 (1.4)	1.7 (1.0)
Number of additional disabilities (<i>M</i>)	0.9 (1.0)	0.8 (0.9)	1.4 (1.0)

Note. Values are percentages or means. Standard deviations (*SD*) presented in parenthesis adjacent to means (*M*) for age at disability onset, years since disability onset, encouragement to work, additional disabilities. Weighted sample total $N = 322$; individuals who worked after disability onset, $n = 241$; individuals who did not work after disability onset, $n = 81$. Data from the 2014 Survey of Disability and Employment.

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Table 2

Logistic regression model results

Variable	<i>b</i>	<i>SE</i>	<i>df</i>	Wald χ^2	<i>p</i>	OR [95% CI]
Age at disability onset	0.01	0.02	1	0.05	0.82	
Years since disability onset	-0.14	0.08	1	3.36	0.07	
Age at disability onset X years since disability onset	0.01	0.003	1	17.37	<.001	^a
Female	-1.16	0.43	1	7.33	0.01	0.31 [0.14, 0.73]
White	-0.71	0.43	1	2.76	0.10	0.49 [0.21, 1.14]
Education (ref = HS, PS, AA, certificate)			2	5.13	0.08	
Less than high school	-1.23	0.62	1	3.90	0.05	0.29 [0.09, 0.99]
Bachelor's degree or above	-0.78	0.52	1	2.23	0.14	0.46 [0.17, 1.27]
Receipt of government disability benefit	-3.96	0.56	1	50.25	<.001	0.02 [0.01, 0.06]
Health	0.78	0.44	1	3.09	0.08	2.18 [0.91, 5.21]
Encouragement to work	0.68	0.16	1	18.51	<.001	1.97 [1.45, 2.68]
Number of additional disabilities	-0.68	0.24	1	8.43	0.004	0.50 [0.32, 0.80]

Note. *SE* = standard error. OR = odds ratio. *df* = degrees of freedom. CI = confidence interval. HS = high school education. PS = post-secondary education. AA = associate degree.

^a Follow up results of the interaction between age at disability onset and years since disability onset are presented in Figure 1.

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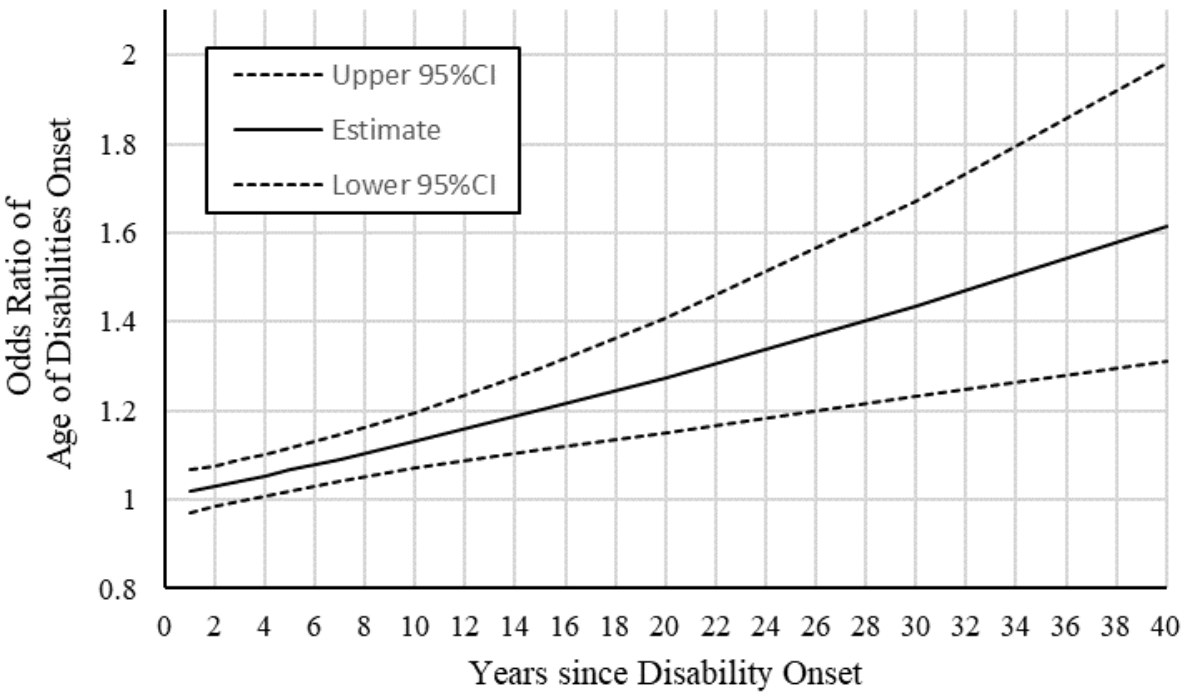


Figure 1. The trend of odds ratio of working based on age at disability onset associated with years since disability onset.