

# 4510 - PREDICTORS OF WORK PRODUCTIVITY AMONG INDIVIDUALS SCHIZOPHRENIA: A SCOPING REVIEW

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# PREDICTORS OF WORK PRODUCTIVITY AMONG INDIVIDUALS WITH SCHIZOPHRENIA: A SCOPING REVIEW

*Prediktor Produktivitas Kerja Pada Klien Skizofrenia: a scoping review*

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## 5 ABSTRACT

Schizophrenia is a chronic mental disorder that substantially impairs social functioning and work productivity, leading to high unemployment rates and significant economic burdens for individuals, families, and society. Despite the importance of employment for recovery and quality of life, evidence regarding the predictors of work productivity among individuals with schizophrenia remains fragmented. This scoping review aimed to identify and map key factors associated with work productivity in individuals with schizophrenia. The review was conducted following the PRISMA-ScR guidelines. Inclusion criteria encompassed full-text articles written in English or Indonesian that examined predictors of work productivity among individuals with schizophrenia. After systematic screening and eligibility assessment, ten studies were included in the final analysis, comprising various research designs such as cross-sectional, longitudinal, cohort, randomized controlled trials, and case reports. The findings indicated that work productivity in individuals with schizophrenia is influenced by four main domains: cognitive function, motivation and psychological factors, family and social support, and work rehabilitation interventions. Cognitive abilities, particularly social cognition and executive function, along with negative and depressive symptoms, were consistently associated with vocational outcomes. Motivation positively affected work productivity but was often moderated by internalized stigma. Family support and supportive work environments enhanced productivity, while vocational rehabilitation, cognitive-based occupational therapy, and Theory of Mind training showed beneficial effects on work functioning. In conclusion, work productivity among individuals with schizophrenia is determined by multidimensional and interrelated factors, highlighting the need for integrated interventions to support sustainable employment and functional recovery.

**Keywords:** Schizophrenia, Schizophrenia Patient, Work Productivity, Predictors, Vocational

## 5 ABSTRAK

Skizofrenia adalah gangguan mental kronis yang secara substansial mengganggu fungsi sosial dan produktivitas kerja, yang mengakibatkan tingkat pengangguran yang tinggi dan beban ekonomi yang signifikan bagi individu, keluarga, dan masyarakat. Meskipun pentingnya pekerjaan untuk pemulihan dan kualitas hidup, bukti mengenai prediktor produktivitas kerja di antara individu dengan skizofrenia tetap terfragmentasi. Tinjauan skoping ini bertujuan untuk mengidentifikasi dan memetakan faktor-faktor kunci yang terkait dengan produktivitas kerja pada individu dengan skizofrenia. Tinjauan ini dilakukan mengikuti pedoman PRISMA-ScR. Kriteria inklusi mencakup artikel teks lengkap yang ditulis dalam bahasa Inggris atau Indonesia yang meneliti prediktor produktivitas kerja di antara individu dengan skizofrenia. Setelah penyaringan sistematis dan penilaian kelayakan, sepuluh studi dimasukkan dalam analisis akhir, yang terdiri dari

berbagai desain penelitian seperti cross-sectional, longitudinal, kohort, uji coba terkontrol acak, dan laporan kasus. Temuan menunjukkan bahwa produktivitas kerja pada individu dengan skizofrenia dipengaruhi oleh empat domain utama: fungsi kognitif, motivasi dan faktor psikologis, dukungan keluarga dan sosial, serta intervensi rehabilitasi kerja. Kemampuan kognitif, terutama kognisi sosial dan fungsi eksekutif, bersama dengan gejala negatif dan depresi, secara konsisten dikaitkan dengan hasil vokasional. Motivasi berdampak positif pada produktivitas kerja tetapi sering dimoderasi oleh stigma internal. Dukungan keluarga dan lingkungan kerja yang mendukung meningkatkan produktivitas, sementara rehabilitasi vokasional, terapi okupasi berbasis kognitif, dan pelatihan Teori Pikiran menunjukkan efek yang bermanfaat pada fungsi kerja. Kesimpulannya, produktivitas kerja pada individu dengan skizofrenia ditentukan oleh faktor-faktor multidimensional dan saling terkait, yang menyoroti perlunya intervensi terintegrasi untuk mendukung pekerjaan yang berkelanjutan dan pemulihan fungsional.

**Kata kunci:** Skizofrenia, Pasien Skizofrenia, Produktivitas Kerja, Prediktor, Vokasional

## INTRODUCTION

Schizophrenia is associated with a substantially increased risk of premature mortality [1]. According to the World Health Organization WHO (2022) schizophrenia ranks as the fourth most prevalent chronic mental disorder globally, affecting approximately 24 million individuals, or about 1 in 300 people (0.32%) worldwide. Globally according to the World Health Organization (2016) estimates that mental disorders affect approximately 35 million people with depression, 60 million with bipolar disorder, and 21 million with schizophrenia. In Indonesia, data from the 2023 Indonesian Health Survey (2023) indicate that the prevalence of households with at least one member diagnosed with schizophrenia or psychosis is 4.0 per 1,000 households, meaning that four out of every 1,000 households have a member exhibiting signs and symptoms of schizophrenia or psychosis. In West Java Province, the prevalence of household members with psychotic symptoms is reported at 3.0 per 1,000 households, with an overall prevalence of mental disorders reaching 3.8 per 1,000 population [5]. These findings highlight that mental disorders, including schizophrenia, remain a serious public health concern in Indonesia, with a persistently high and clinically significant prevalence.

Clients with schizophrenia face various challenges after being discharged from inpatient care. Based on research on 2046 schizophrenia respondents, 56% of them experienced rehospitalization. Additionally, clients with schizophrenia experience problems with social functioning. Research by Farizah et al., (2019) on 38 respondents with schizophrenia found that 85.7% experienced problems with social functioning. In addition, schizophrenia can also lead to a decrease in work productivity for those who experience it. Research by Nova et al., (2023) on 107 respondents with mental disorders in Malang found that 35.5% of respondents had low work productivity, 32.7% had moderate work productivity, and 31.8% had high work productivity.

Clients with schizophrenia often do not have jobs after being in the community. The unemployment rate among individuals with schizophrenia is very high, ranging from 80% to 90% [7]. In the United States, unemployment among individuals with schizophrenia is 69% [8]. Other countries, such as Sweden, have experienced a decrease in work productivity of approximately 10% [9]. Previous studies conducted by Waghorn (2015) in Western countries found that only about 12 – 39% of schizophrenia clients have stable employment, while the rest rely solely on family support and social services.

Unemployment among schizophrenia patients is associated with financial burden. The financial burden caused by schizophrenia in developed countries like the UK is estimated to have reached 6.7 billion pounds in 2004–2005 [11]. Half of this cost is related to unemployment, work absenteeism, and premature deaths, totaling 3.4 billion pounds [12]. Meanwhile, the total burden of mental health issues in Canada is estimated at 4.4 billion, with \$8.1 billion for lost productivity and \$6.3 billion for treatment [13]. In Indonesia in 2020, the financial burden of mental health patients for treatment was 87.5 trillion rupiah, or approximately USD 6.2 billion [14]. Work productivity in clients with schizophrenia is related to stigma. Research by Hampson et al Hampson et al (2020) on 137 respondents with psychosis found several impacts of stigma in the workplace. These impacts include a tendency to avoid work, unwillingness to disclose mental health conditions, work-related stress, and reduced working hours.

Work productivity is recognized as being very important, with various benefits as outlined in the background above. However, there is still no research that summarizes and analyzes predictors related to work productivity in people with schizophrenia. Previous reviews only discussed interventions, therefore this scoping review aims to identify predictors related to work productivity in people with schizophrenia in order to provide a general overview that can inform future research, clinical practice, and development. The ultimate goal is to increase work productivity by addressing the complex interactions of predictors that contribute to work productivity.

## METHODS

This research is a scoping review. As one of the purposes of conducting a scoping review is to summarize and disseminate research findings in a specific field, this is also in line with one of the indications for using this scoping review approach, according to Munn et al, (2018), which is to identify the type of evidence available in a specific field that is similar to evidence mapping activities. The scoping review method began with identifying research questions using PCC. Next, a study selection was conducted by establishing inclusion and exclusion criteria, compiling and summarizing the results, and reporting them. These results were then consulted with a competent.

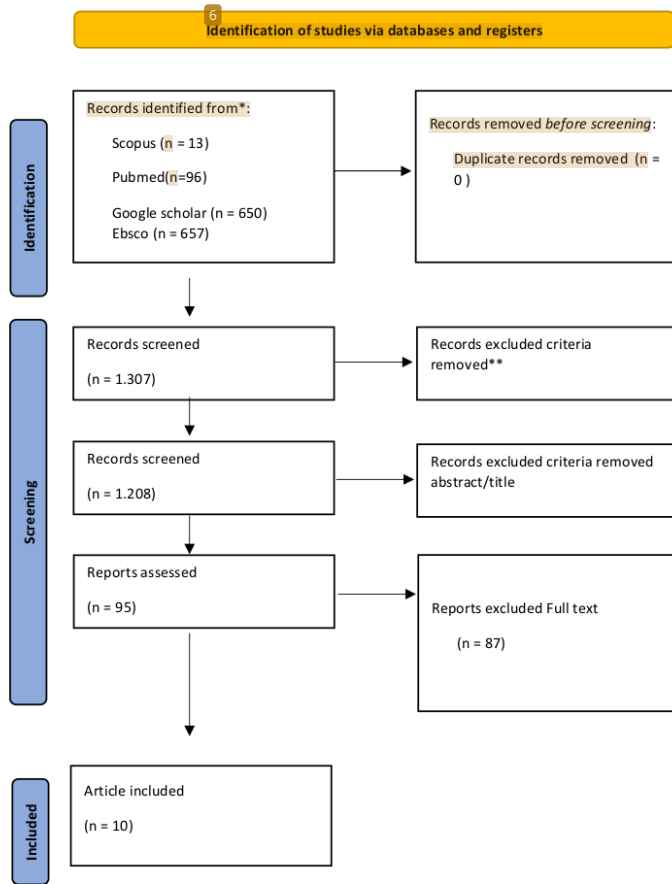
P (Population) : *Schizophrenia*

C (Concept) : *Productivity*

C (Context) : *Predictors of Productivity*

Select duplicate files by looking at article titles. (2) Skrining tahap I with elimination based on inclusion criteria, which are publications from 2015 to 2025. (3) Skrining tahap II by eliminating based on abstrak and judul (4). Examining the third-phase skrining results in a comprehensive manner yields ten articles (5). Using ten previously analyzed articles, create an evidence-based practice table. Analysis of the article is done in three stages. The first step is to read all of the articles carefully and comprehend their contents. Tahap kedua extracts the bacaan and diringkas results in a table format. Figure 1 presents information on the study, its location, its purpose, its type, its sample, its data collection method, and its range of results.

Figure 2. PRISMA



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**Search Strategy and Eligibility Criteria**

A comprehensive literature search was conducted across various databases, including PubMed, EBSCO, Google Scholar and SCOPUS focusing on articles published within the last 10 years (2015-2025). Keywords included are (Schizophrenia OR "schizophrenic patients" OR "severe mental disorder") AND ("work productivity" OR "occupational functioning") AND ("predictors of productivity" OR "factors influencing employment" OR "vocational rehabilitation"). Articles were managed in Mendeley Desktop, with duplicates removed. Inclusion criteria were: a) articles published in the last 10 years; b) written in English or Indonesian; c) full-text availability; d)

examining the predictors of work productivity schizophrenia and exclusion criteria were: a) studies without schizophrenia b) studies without output work productivity.

## RESULT

A total of 1,307 articles were initially identified through database searches. After removing duplicates and screening titles and abstracts, 215 articles were selected for excluded, 10 articles were included in the final analysis. The selected studies were published between 2015 and 2025.

Table 1. Predictors of Work Productivity Among Individuals with Schizophrenia

Desain	Sampel	Predictors	Conclusion	References
Studi longitudinal	53 adults with schizophrenia	There was no significant difference in positive symptoms before and after work ( $p > 0.05$ ).	Pre-vocational programs are effective; remission and mild symptoms support work success.	[16]
Cross sectional	58 client schizophrenia	NSA-16 (Negative Symptom Assessment) : ( $\beta = -0.644, p < 0.001$ ) BACS (Brief Assessment of Cognition in Schizophrenia) : ( $\beta = 0.355, p = 0.006$ )	The relationship between BACS employment status and the NSA-16 subscore (communication + affect) is not significantly correlated.	[19]
Cross sectional	40 client of schizophrenia early psychosis	Motivasi : ( $\beta = 0.42, p < 0.001$ ) ISMI : ( $\beta = -0.30, p < 0.001$ )	This study shows that motivation plays an important role in improving role functioning, including the ability to work. However, the influence of this motivation can be hindered by internalized stigma, which reduces the chances of optimal functioning even with high motivation.	[20]

Cross sectional	107 Sampel	Significant correlation p = 0.028 Productivity results: 31.8% high productivity; 35.5% low	1 There is a significant relationship between family support and work productivity.	[21]
Cross sectional	143 schizophrenia	Quality of life (MANSA) was higher in the working group: p < 0.01	The research findings indicate that employment status influences quality of life thru self-esteem and reduced stigma.	[9]
Case Study	50 years schizophrenia	The assessment results using the COTE Scale showed a decrease in score from 65 before the intervention to 42 after the intervention, indicating an improvement in the client's communication and social interaction skills. Additionally, the Work Behavior Inventory (WBI) score also decreased from 38 to 25, indicating an improvement in work stress management and adaptive coping abilities for work pressure and failure.	CBT and occupational therapy show significant results in improving the financial skills of clients with mental disorders.	[22]
Cross sectional	37 schizophrenia	IQ (0.040) and verbal fluency (p = 0.019) cognitive functions. TOM (p = 0,005)	This study concludes that ToM ability is the strongest predictor of work competence in clients with schizophrenia.	[23]

Cohort study	153 schizophrenia	Work motivation (p = 0.003) and quality of life (p = 0.011), while depression symptoms (p = 0.044), self-efficacy (0.234), and work companions (p = 0.001).	Modifiable predictors of supported employment are cognitive function and negative symptoms. However, for depressive symptoms, there is a negative correlation with work success.	[24]
Case report	29 years schizophrenia	Work balance is 38.46%, daytime rest and sleep is 30.77%, IADL is 17.94%, work is 10.26%, BADL is 2.57%, and leisure time is 2.57%.	The conclusion of this study is that to address work-life imbalance in schizophrenia, it is necessary to understand the type of time use with occupation-based interventions for clients.	[25]
Randomized control trial	60 schizophrenia		The overall results indicate that chronic schizophrenia inpatients can be successfully rehabilitated if given the opportunity.	[26]

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A total of ten studies published between 2015 and 2025 were included in this scoping review. The included studies consisted of various research designs, namely longitudinal studies, cross-sectional studies, cohort studies, randomized controlled trials, and case reports, with sample sizes ranging from individual case reports to 153 participants with schizophrenia. The findings identified multiple predictors of work productivity among individuals with schizophrenia, which can be grouped into cognitive factors, motivational and psychological factors, family and social support, quality of life, and work rehabilitation interventions.

#### **Cognitive and Symptom-Related Predictors**

Cognitive function and symptom severity were consistently identified as important predictors of work productivity. A cross-sectional study involving 58 individuals with

schizophrenia reported that cognitive performance measured using the Brief Assessment of Cognition in Schizophrenia (BACS) was positively associated with employment status ( $\beta = 0.355$ ,  $p = 0.006$ ), while negative symptoms assessed using the Negative Symptom Assessment-16 (NSA-16) showed a strong negative association with work outcomes ( $\beta = -0.644$ ,  $p < 0.001$ ) [19]. However, the study also noted that the NSA-16 subscore related to communication and affect was not significantly correlated with employment status. Another cross-sectional study involving 37 individuals with schizophrenia demonstrated that specific cognitive domains, including intelligence quotient (IQ) ( $p = 0.040$ ), verbal fluency ( $p = 0.019$ ), and Theory of Mind (ToM) ability ( $p = 0.005$ ), were significantly associated with work competence [23]. Among these variables, ToM was identified as the strongest predictor of work competence, highlighting the importance of social-cognitive functioning in vocational outcomes.

A longitudinal study of 53 adults with schizophrenia reported no significant difference in positive symptoms before and after work participation ( $p > 0.05$ ). Nevertheless, the findings indicated that individuals in remission or with mild symptoms showed better work success, supporting the role of symptom stability in vocational functioning [16].

#### **Motivation, Stigma, and Psychological Factors**

Motivation was identified as a key predictor of work productivity and role functioning. A cross-sectional study involving 40 individuals with early psychosis found that motivation had a significant positive effect on role functioning, including work ability ( $\beta = 0.42$ ,  $p < 0.001$ ) [20]. However, this relationship was negatively influenced by internalized stigma, as measured by the Internalized Stigma of Mental Illness (ISMI) scale ( $\beta = -0.30$ ,  $p < 0.001$ ). These findings suggest that although high motivation enhances work functioning, internalized stigma may reduce the effectiveness of motivation in achieving optimal productivity.

In a cohort study involving 153 individuals with schizophrenia, work motivation was significantly associated with supported employment outcomes ( $p = 0.003$ ) [24]. In addition, quality of life ( $p = 0.011$ ) and the presence of work companions ( $p = 0.001$ ) were positively associated with work success, whereas depressive symptoms showed a negative association with employment outcomes ( $p = 0.044$ ). The study also identified cognitive function and negative symptoms as modifiable predictors of supported employment.

#### **Family Support and Social Factors**

Family support emerged as a significant social predictor of work productivity. A cross-sectional study involving 107 participants reported a statistically significant relationship between family support and work productivity ( $p = 0.028$ ) [21]. The study found that 31.8% of participants had high work productivity, while 35.5% demonstrated low productivity, indicating variability in outcomes depending on the level of family support received.

Employment status was also associated with broader social and psychological outcomes. A cross-sectional study involving 143 individuals with schizophrenia showed that participants who were employed had significantly higher quality of life scores measured using the Manchester Short Assessment of Quality of Life (MANSA) compared to those who were unemployed ( $p < 0.01$ ) [9]. The study further suggested that self-esteem and reduced stigma played mediating roles in the relationship between employment status and quality of life.

#### **Work Rehabilitation and Therapeutic Interventions**

Several studies highlighted the effectiveness of rehabilitation and therapeutic interventions in improving work productivity. A case study of a 50-year-old individual with schizophrenia demonstrated that cognitive behavioral therapy combined with occupational therapy resulted in improvements in communication, social interaction, and work behavior. This was evidenced by a reduction in the Comprehensive Occupational

Therapy Evaluation Scale (COTE) score from 65 before the intervention to 42 after the intervention, and a decrease in the Work Behavior Inventory (WBI) score from 38 to 25, indicating improved work stress management and adaptive coping skills [22].

A randomized controlled trial involving 60 individuals with schizophrenia reported that chronic inpatients could be successfully rehabilitated when provided with appropriate vocational opportunities [26]. These findings support the role of structured work rehabilitation programs in enhancing vocational outcomes among individuals with schizophrenia.

Additionally, a case report involving a 29-year-old individual with schizophrenia examined patterns of time use and work-life balance. The results showed that work activities accounted for only 10.26% of daily time use, while the majority of time was spent on rest and sleep (30.77%) and work balance activities (38.46%). The study concluded that occupation-based interventions are necessary to address work-life imbalance and improve productive engagement in individuals with schizophrenia [25].

## DISCUSSION

Based on a review of ten international journals from 2015 to 2025, it was found that work productivity in schizophrenia clients is significantly influenced by a combination of cognitive, motivational, psychosocial factors, and family support. Research by McGurk et al. (2022) shows that cognitive function serves as a primary predictor of successful employment acquisition. Cognitive rehabilitation has been proven to reduce the negative impact of neurocognitive disorders on work performance and help clients maintain employment sustainably. This aligns with the findings of Lexen et al. (2016), who confirmed that problem-solving and attention skills are important factors supporting vocational rehabilitation success in clients with schizophrenia.

Beside cognitive factors, intrinsic and extrinsic motivational aspects are key determinants in increasing work productivity. A study by Reddy et al. (2016) found that individuals with high motivation showed better work performance and were more resistant to negative symptoms of schizophrenia. Research conducted by Saperstein et al. (2011) also confirms that intrinsic motivation is a key component of success in vocational rehabilitation, with internally motivated clients being more adaptable to work demands. This finding is supported by DeTore et al. (2022), who stated that motivation plays a significant role in improving social role functioning and work ability, but its effect can be hindered by internalized stigma, which reduces client engagement in productive activities.

Social and family support factors also contribute to the work productivity of schizophrenia clients. Based on research by Nova et al. (2023) a significant relationship was reported between family support and productivity levels, where clients with good emotional and social support were more capable of maintaining job stability. Meanwhile, research by Mahmood et al. (2019) highlights that modifiable factors such as work motivation and quality of life have a positive influence on work success, while symptoms of depression are a significant obstacle. Interventions that increase social engagement and work motivation can help clients achieve success in supported employment programs.

Some studies also highlight the important role cognitive and occupational rehabilitation as a primary intervention for improving work function. Based on the opinion of Bell et al. (2014), it was found that the combination of cognitive remediation and supported employment significantly improved social participation and productive abilities of clients with low community functioning. According to Bechi et al. (2019) theory of mind (ToM) is a strong predictor of work competence, surpassing IQ and clinical symptoms, making ToM-based training recommended for improving work performance. On the other hand, Park, (2022) emphasized the importance of occupational balance

with a client-centered occupational therapy approach to improve quality of life and work-life balance.

Overall, the literature from the past decade suggests that work productivity in clients with schizophrenia is the result of a complex interaction between cognitive function, intrinsic motivation, social stigma, and family support and vocational rehabilitation. Efforts to increase productivity require a multidimensional approach involving cognitive training, motivational reinforcement, work-based interventions, and ongoing social support to enable clients to achieve optimal economic independence and social recovery.

## CONCLUSION

This scoping review concludes that work productivity among individuals with schizophrenia is primarily influenced by cognitive function, motivation, family and social support, quality of life, and work rehabilitation interventions. Cognitive abilities, particularly social cognition and executive function, along with the presence of negative and depressive symptoms, are key determinants of vocational outcomes. Motivation positively affects work productivity but may be weakened by internalized stigma. Family support and supportive work environments enhance productivity and employment sustainability, while structured vocational rehabilitation and occupational-based interventions play a crucial role in improving work competence and adaptive functioning.

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