Use of Welfare Technology to Increase Employment of Individuals with Intellectual Disabilities

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Abstract

Welfare technology can be applied to increase the involvement and independence of individuals with disabilities. While it is mainly applied for elderly, there are also initiatives for persons with intellectual disabilities, for different purposes. This group is currently marginalized in the labour market and there is a need to increase the support for employment. In this study, we provide an overview of previous literature reviews on intellectual disability and employment. Based on these findings, we discuss in which areas welfare technology could support employment of individuals with intellectual disabilities. The results show that employer attitudes, job coaches and support programs are important for employment. Drawing on prioritised areas within welfare technology, we recommend to study how technology can be supportive within these areas, focusing on social inclusion in working life, a structured working life and public service delivery.

Keywords:

Intellectual Disability, Employment, Technology.

Introduction

Welfare technology is seen as an important concept and innovation policy in the Scandinavian countries [1]. With an increasing need for welfare services, and with fewer people to provide those services, technology is viewed as an important step in managing that challenge. Welfare technology can be applied to maintain or increase involvement and/or independence of individuals with disabilities [2, 3]. It encompasses services for clients, healthcare professionals, relatives, industries and the society [2] and is seen as a heterogeneous group of technologies ranging from communication support, assistive technology, disease management, technology for everyday tasks, entertainment and social support [4, 5]. In Norway, welfare technology is often defined as *"...technological assistance that contributes to increased security, social participation, mobility and physical and cultural activity, and strengthens the individual's ability to manage himself in everyday life despite illness and social,* psychological or physical impairment. Welfare technology can also serve as support for next-of-kin and otherwise help improve accessibility, resource utilization and quality of service"* [3].

Welfare technology is mainly applied for elderly living at home, for instance as safety and fall alarms and different kind of sensors implemented in the home environment. Other examples include technology that provides medication reminders and the use of tablets and mobile phones to reduce social isolation and to increase efficiency [2, 3, 5]. However, there are also initiatives for applying welfare technology for persons with intellectual disabilities, both in Norway [3, 6] and in other Scandinavian countries [2]. These initiatives include sensors and alarms [2] but also technologies for localisation, communication, structure and time management and information exchange between different actors [7].

Today, a majority of Norwegian individuals with intellectual disabilities either have placements at day-centers (48%) or in workplaces provided by social care services (41%). In addition, almost all individuals receive social support at the age of 26 [8] and compared to other OECD countries there is a high rate of incapacity-related support [9]. A Norwegian report shows that individuals with disabilities are marginalized in both the traditional labor market and in segregated workplaces within the state labor market initiative [8]. A similar situation is also the case for other Scandinavian countries [10, 11]. This is a challenge as an active working life is described as one of the foundations for inclusion in society. Apart from earning livelihood, it has a positive impact on establishing a social network and identity, increasing self-esteem, providing structure and increasing health and well-being [10, 12-14]. Hence, we argue that there is a need to increase the support for employment of individuals with intellectual disabilities.

The work market is changing, it is becoming more unstable and complex, and also asks for flexibility of workers – and this makes it important to understand how individuals with intellectual disabilities can be supported in the work market [15]. The aim of this paper is to present an overview of previous literature reviews on intellectual disability and em-

ployment and to identify areas that are of importance for obtaining and maintaining employment. Based on these findings, we aim to discuss in which areas welfare technology could support the employment of individuals with intellectual disabilities.

Methods

The databases of Academic Search Complete, MedLine, PsycINFO, CINAHL and EMBASE were scanned for reviews focusing on intellectual disability and employment. The following keywords were used: intellectual disability AND employment AND review, and these were searched for in the abstract, with no restriction for included years. In total, 123 articles and book chapters were obtained. We included both systematic and scoping reviews, that investigated barriers and enablers for employment of individuals with intellectual disabilities. In addition, one review article was retrieved based on back tracking references, hence; we started with a total of 124 articles and book chapters.

After removing duplicates (n=76) and book chapters (n=4), the abstracts of 44 articles were read to determine an inclusion or not. This resulted in the exclusion of 39 articles due to a focus on the situation of individuals with disabilities in specific countries (n=5), specific approaches or interventions (n=8), cost analysis (n=4), quality of life or social inclusion (n=7), not providing a review of existing literature or lacking a description of the search strategy (n=11), other focus (n=4) or not being accessible (n=3). In total, 5 review articles were included for further analysis (Figure 1).
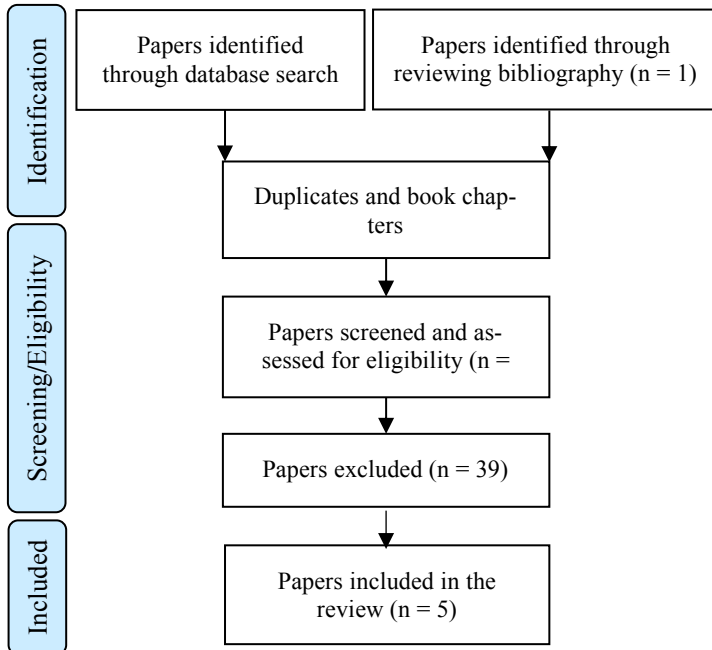

Figure - Flow diagram of the search process.

As a second step, the articles were read in detail. The cited studies, included in the reviews, that reported barriers and enablers for employment were classified in four main themes; the workplace context, the individual context, the societal context and the use of technology or techniques. The cited studies were assessed to determine the outcome of the investigated enablers/barriers. For example, in the review by Cheng, Oakman [16], a study by McInnes et al. [2010] reported that "*following job coaching, participants are three times more likely to be employed*". Hence, a positive impact was coded for the area individual context – job coaches. Studies that stated that employment of individuals with disabilities was low, but with no further explanation were not included in the analysis. Table 1 shows an overview of how the barriers and enablers were classified into different areas (a detailed overview can be obtained from the lead author).

Table 1: Areas that influence the employment of individuals with intellectual disabilities.

Area Study	[17]	[16]	[18]	[19]	[20]
Total number of studies	27	20	50	28	55
Workplace context = 35 articles					
Co-workers' support	10	4	4	-	6
Employer attitudes	4	-	-	7	-
Individual context = 51 articles					
Job training & Job search assistance	5	6	14	1	3
Job matching	1	1	2	3	7
Job coaches	3	4	1	-	-
Societal context = 8 articles					
Welfare benefits	1	-	-	3	4
Welfare technology & techniques = 18 articles					
Technology	-	3	9	-	-
Techniques	3	2	1	-	-
Studies not focusing on factors for employment	0	0	19	14	35

Results

The workplace context

The workplace context included issues connected to support from co-workers and opinions of employers regarding individuals with intellectual disabilities. The largest number of studies relating to the workplace context was included in the review by Ellenkamp, Brouwers [17] (n=14). While it was found that support from co-workers was important for integration and interaction in the workplace (n=10), it seems unclear how it affects the possibilities of obtaining or main-

taining employment. Only two studies found support for maintaining work. The results in the review by Cheng, Oakman [16] were varied, one of the studies cited found that support from co-workers can increase job placement rates while the other three studies found no support for such rates. Similar findings were indicated in the review by Hedley, Uljarevic [18] in which one study identified that a supportive workplace fosters the success of individuals with autism spectrum disorder. In two other studies, employees with intellectual disabilities stressed the importance of support and understanding in the workplace but the effect on the quality of the employment was unclear. Six studies in the review by Lövgren, Markström [20] suggested that peer support improves the opportunities to obtain and keep an employment but with no ascertained evidence. Two of the studies did stress that simply providing support is not enough, there is also need for some form of education, for instance mentoring, and for financial support. This was explored in another study. The study showed that while education in mentoring for staff members who work with job training for individuals with intellectual disabilities improved the feedback provided by staff members, the behavior of the individuals with disabilities remained unchanged [18].

Employers' attitudes towards employing individuals with disabilities were identified as an important enabler in two of the reviews [17, 19]. Two studies found that safety, productivity, attendance, availability of supportive services, no behavioral problems and punctuality are of importance to employers [17]. In addition, employers with previous experiences of staff with intellectual disability are more likely to employ individuals with disabilities compared to those without previous experiences [17]. The review by Cavanagh, Bartram [19] focused on human resource management and identified seven studies which reported that employer attitudes are a barrier towards employment of individuals with intellectual disability.

The individual context

A large number of articles focused on support for the individual. This included job training, job search assistance, job matching and job coaches. The review by Hedley, Uljarevic [18] found 14 studies which explored the importance of employment support programs and services, such as job search assistance and on-the-job training. The impact of such support was reported to have a positive effect on obtaining employment in all fourteen studies and one of the studies reported positive influence on increased working hours and wages. Four out of five studies in the review by Ellenkamp, Brouwers [17] found that job training was an important enabler for obtaining employment. The review by Cheng, Oakman [16] included six articles that focused on different kind of job support in which job search assistance and on-the-job training were found to be helpful in gaining and retaining an open employment. A small case study found support for the combination of off-the-job training and on-the-job training for individuals with autism for quicker skill uptake and gaining experience of a work context. While it made the participants work ready it is unclear if it had any effect on employment [19]. Alternatives to early placement

for on-the-job training were presented in one review (n=3) [20]. This included short periods at different workplaces for individuals with autism in order to foster an understanding of work. However; the connection to obtaining or maintaining employment was not reported.

The importance of matching the interests of the individual with the employment was mentioned in all the reviews [16-20]. One study found positive support for the use of person-centered planning to determine employment preferences [16] and another study found that matching interests and abilities increased the possibility to maintain employment [17]. Two studies recommended that matches should be more strategic and focus on occupations where individuals with intellectual disabilities are well-represented [20]. Ten additional studies recommended matching of interests and work, still it seems unclear how it affects the possibilities of obtaining or maintaining employment.

Four studies in the review by Cheng, Oakman [16] focused on job coaches. Three of them showed that coaches have a positive effect on obtaining and retaining an employment. This was also indicated by four other studies which found that job coaches were important for employers' decision to hire individuals with intellectual disabilities and for maintaining employment [17, 18]. However, one study showed that a decrease of job coach support can have positive outcomes on work productivity for individuals with severe intellectual disability [16].

The societal context

One study related to welfare benefits showed that subsidies for employers as well as individually placed persons increased the salary of individuals with intellectual disabilities [17]. The role of welfare programs was also mentioned in the review by Cavanagh, in which three studies reported on the need for increased support from such programs. A call for more coordinated work around welfare programs was mentioned in four other studies [20]. However, the negative impact on employment due to current programs was not described.

Welfare technology and techniques

Concerning completion of work tasks, three of the reviews included studies that focused on the use of instructional approaches (n=6) and welfare technologies (n=12) [16-18]. Different kind of non-technological approaches included training for work tasks with the use of specific words, career development tasks [17] and checklists [16] which all showed to increase the work performance of individuals. One study discussed an assessment instrument [17] and two articles explored behavior techniques including incidental teaching, discrete-trail teaching and social stories [16, 18]. These results seemed promising but due to limited research, the effects on employment outcomes had not been identified.

The use of welfare technology to assist individuals with disabilities included teaching of tasks through e.g. video instructions and audio coaching [16] which both showed to improve work performance. Hedley, Uljarevic [18] also reported on positive outcomes of implementing a personal digital assis-

tant which increased working time and using virtual jobs which improved interviewing skills. The use of an iPad at work was also shown to increase independence, confidence, time management and organizational skills. However, the effects of video self-modelling to learn work tasks [16] and the impact of other applications could not be ascertained [18]. In total, half of the studies did not report a positive impact on improved work performance while the other half did.

Discussion

The reviews included in our study focused on barriers and enablers for employment of individuals with intellectual disability. The reviews showed limited support for positive outcomes on employment for areas such as co-workers' support and job matching. While these areas were stressed as important in several studies, few studies reported on actual impact on either obtaining or maintaining employment. On the other hand, the support from co-workers did however increase the integration of individuals with intellectual disabilities and their interaction with colleagues. A few studies discussed welfare benefits and criticized current initiatives but lacked support for its' negative impact on employment.

The reviews and the cited studies focusing on employer attitudes showed that their attitudes towards individuals with disabilities are important for obtaining and maintaining an employment. While there were few studies focusing on job coaches, seven out of eight studies supported the positive influence of job coaches. In addition, the majority of the studies on support programs (22/27) reported positive evidence related to employment. The studies of applications of different approaches and technologies to support employment of individuals with intellectual disabilities, reported mixed results, showing either positive effects on work performance or the need of more research. To summarize, the following areas seem to be important for the ability to obtain and maintain an employment: (1) employer attitudes, (2) job coaches and (3) support programs.

It appears that the employment of individuals with intellectual disabilities depends on several initiatives and that there is a need to work within several areas. In view of the current discussion on the potential of welfare technology [21] it is of vital importance to explore if and how welfare technology can be applied within these areas. In Norway, an influential white paper argued to focus on three main technology areas: safety alarms, technology that increases social inclusion and technology that supports an active and structured everyday life [3]. For individuals with intellectual disabilities, the last two areas are of interest due to the current exclusion from working life [8, 9, 15] and due to the individuals' disability, limiting their actions that are performed within a societal environment [22, 23]. Drawing on these recommendations and the results in our study, we recommend to explore the potential of welfare technologies in the following areas:

- Technologies that support social inclusion in working life, targeting employer attitudes, activities provided by job coaches and activities performed in support programs.

- Technologies that support a structured working life, targeting activities provided by job coaches and activities within support programs.

Apart from the three main areas, there is a need to invest in technologies that support the delivery of public services and the exchange of information between all involved actors in the welfare system [3]. This is similar to what is described as back-office technologies for public e-services, i.e. the parts of the service process which is not visible to citizens but connected to the technology in the supplying organization [24]. With the wide range of actors involved in the use of public e-services and its complexity, it is important that information can be communicated and shared without disruption [25]. We therefore propose to study technologies that support the internal components of public services that are offered to individuals with intellectual disabilities. This includes technologies used by other users, for instance those who are employed in social services, schools and healthcare services, who are in contact with individuals with intellectual disabilities.

Limitations

This study included English language reviews published in peer-reviewed outlets, which neglects findings presented in white papers and in other languages. Further, only a small number of reviews were identified, however; we believe that the included reviews cover many studies and that our study presents a synthesis of the literature.

Conclusions

Our synthesis of the reviews and the included articles presents a number of areas that are of importance for employment of individuals with intellectual disabilities. Employer attitudes, job coaches, support programs and, to some extent, technology appear to play an important role for the possibility to obtain and maintain employment. With this background, it should be further explored how welfare technologies can be applied within these areas, focusing on social inclusion, a structured working life and public service delivery.

References

[1] Brynn R. Universal Design and Welfare Technology. Studies in health technology and informatics 2016: 229: 335-44.

[2] Socialstyrelsen. E-hälsa och välfärdsteknik i kommunerna 2017.

[3] Norges offentlige utredninger. Innovasjon i omsorg. 2011.

[4] Hofmann B. Ethical Challenges with Welfare Technology: A Review of the Literature. Sci Eng Ethics. 2013: 19 (2): 389-406.

[5] Stowe S, Harding S. Telecare, telehealth and telemedicine. Eur Geriatr Med. 2010: 1 (3): 193-7.

[6] Knarvik U, Rotvold G-H, Bjørvig S, Bakkevoll P-A. Kunnskapsoppsummering: Velferdsteknologi. Tromsø: Nasjonalt senter for e-helseforskning, 2017; pp. 1-43.

[7] Trondsen MV, Knarvik U. Velferdsteknologi for barn og unge med funksjonsnedsettelser. Tromsø: Nasjonalt senter for e-helseforskning, 2017; pp. 1-34.

[8] Wendelborg C, Kittelsaa AM, Wik SE. Overgang skole arbeidsliv for elever med utviklingshemming. Trondheim, Norge: NTNU Samfunnsforskning AS, 2017.

[9] OECD. Investing in Youth: Norway Paris: OECD Publishing, 2018.

[10] Tideman M, Lövgren V, Szönyi K, Bergkvist C, Haghjo A. Intellektuell funktionsnedsättning och arbete. Stockholm, Sweden: Forte, 2017.

[11] Børne- og Socialministeriet. Modtagere af kontanthjælp med handicap. In: Afdeling for Analyse og Datastrateg, editor, 2018; pp. 1-12.

[12] Kober R, Eggleton IRC. The effect of different types of employment on quality of life. J Intell Disabil Res. 2005: 49 (10): 756-60.

[13] Law M, Steinwender S, Leclair L. Occupation, Health and Well-Being. Can J Occup Ther. 1998: 65 (2): 81-91.

[14] Beyer S, Brown T, Akandi R, Rapley M. A Comparison of Quality of Life Outcomes for People with Intellectual Disabilities in Supported Employment, Day Services and Employment Enterprises. J Appl Res Intellect. 2010: 23 (3): 290-5.

[15] Santilli S, Nota L, Ginevra MC, Soresi S. Career adaptability, hope and life satisfaction in workers with intellectual disability. J Vocat Behav. 2014: 85 (1): 67-74.

[16] Cheng C, Oakman J, Bigby C, Fossey E, Cavanagh J, Meacham H, et al. What constitutes effective support in obtaining and maintaining employment for individuals with intellectual disability? A scoping review. J Intellect Dev Dis. 2017: 1-11.

[17] Ellenkamp JJ, Brouwers EP, Embregts PJ, Joosen MC, van Weeghel J. Work Environment-Related Factors in Obtaining and Maintaining Work in a Competitive Employment Setting for Employees with Intellectual Disabilities: A Systematic Review. J Occup Rehabil. 2016: 26 (1): 56-69.

[18] Hedley D, Uljarevic M, Cameron L, Halder S, Richdale A, Dissanayake C. Employment programmes and interventions targeting adults with autism spectrum disorder: A systematic review of the literature. Autism. 2017: 21 (8): 929-41.

[19] Cavanagh J, Bartram T, Meacham H, Bigby C, Oakman J, Fossey E. Supporting workers with disabilities: a scoping review of the role of human resource management in contemporary organisations. Asia Pac J Hum Resou. 2017: 55 (1): 6-43.

[20] Lövgren V, Markström U, Sauer L. Towards Employment: What Research Says About Support-to-Work in Relation to Psychiatric and Intellectual Disabilities. J Soc Work Disabil Rehab. 2017: 16 (1): 14-37.

[21] Nordens välfärdscenter. Nordisk tankesmedja om välfärdsteknologi 2018 [Available from: https://nordicwelfare.org/projekt/nordisk-tankesmedja-om-valfardsteknologi/.

[22] ICD-10. Den internasjonale statistiske klassifikasjonen av sykdommer og beslektede helseproblemer Diktoratet for e-helse, 2018.

[23] Association AP. Diagnostic and statistical manual of mental disorders (DSM-5®): American Psychiatric Pub, 2013.

[24] Lindgren I, Jansson G. Electronic services in the public sector: A conceptual framework. Gov Inform Q. 2013: 30 (2): 163-72.

[25] Axelsson K, Melin U, Lindgren I. Public e-services for agency efficiency and citizen benefit — Findings from a stakeholder centered analysis. Gov Inform Q. 2013: 30 (1): 10-22.

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