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# Challenges of Smoking Cessation Among very Socially Vulnerable

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## Abstract

**Objectives:** Socially vulnerable individuals often face unique social barriers hindering their participation in smoking cessation interventions. This study aims to explore the experience of using of a tailored smoking cessation intervention for very socially vulnerable individuals in Denmark.

**Methods:** An optimized smoking cessation intervention for very socially vulnerable individuals were implemented in Denmark. Recruitment was primarily through referrals from the social sector including healthcare houses, support persons, job centers, healthcare coordinators, and psychiatric community centers. The program integrated interdisciplinary competencies to address social anxiety and provide comprehensive support. The smoking cessation program was based on an evidence-based standardized intensive smoking cessation intervention (I-SCI) used in primary care.

**Results:** The very socially vulnerable intervention included 37 participants. Participants in the very socially vulnerable group were heavier smokers and had lower compliance compared to the standardized I-SCI. The successful quit rate at the end of the intervention was 29% for very socially vulnerable, compared to 51% for the general population of smokers being older of age, mainly women without heavy very social vulnerability. For the 6-month follow-up, 5 (14%) participants of the very socially vulnerable participants remained continued abstinent.

**Conclusion:** It is noteworthy that this very socially vulnerable group participated in smoking cessation interventions and that some successfully quitted, even if temporarily. Further strategies are needed to enhance their engagement to entering the programs and improve the benefits they receive from these programs.

**Keywords:** Disadvantaged Smokers; Gold Standard Program; Intensive Smoking Cessation Intervention; National Database; Social Vulnerabilities.

## Introduction

Smoking cessation programs are widely intended implemented worldwide to control the disproportionately high prevalence of smoking. However, even where such programs exist, they often provide little attention to the social barriers faced by very socially vulnerable individuals [1]. The evidence for the effectiveness of smoking cessation interventions in enhancing the entering and successful quitting among homeless, indigenous populations and other disadvantaged groups as prisoners is spare [2-4]. The literature has documented the relationship between smoking and various social determinants of health, including education, income, concurrent substance use, and comorbidity [5-11]. Very socially vulnerable populations exhibit higher rates of smoking and are characterized by earlier initiation, heavier smoking patterns, and lower success rates in quitting compared to more privileged counterparts [12]. Numerous social and behavioural factors interfere with the process of effectively planning to quit smoking and maintaining abstinence [1,4,11,12,13].

Some common barriers to smoking cessation experienced by very socially vulnerable individuals include both individual and social factors [4,13]. Individual barriers are related to lifestyle factors such as physical addiction, low confidence, behavioural habits, motivation levels, previous unsuccessful attempts, coping with relaxation, stress, mood management, and limited health-related knowledge [4,14]. Social barriers often stem from insufficient support from healthcare professionals, environments conducive to smoking, lack of social support, stressful living and working circumstances, lack of daily structure, and social and geographic isolation [4,13]. Addressing these barriers is crucial to avoiding further widening of social inequalities in health [12,13].

Since its inception in 1995, the Golden Standard Program has emerged as a cornerstone of smoking cessation efforts, particularly within primary healthcare settings [15-17]. This comprehensive intervention consists of a series of at least 5 meetings over 6 weeks, delivered by specially trained therapists. The program, which includes manual-based patient education, is provided free of charge, and the opportunity to receive free nicotine replacement therapy [15]. Extensive research has demonstrated the high effectiveness and cost-effectiveness of the Golden Standard Program in facilitating smoking cessation [15,18-20].

While conventional smoking cessation methods have shown efficacy, there remains a need for innovative approaches to enhance effectiveness and address the diverse needs of very socially vulnerable individuals attempting to quit smoking. Awareness of social and behavioural challenges may enhance and assist the effectiveness of smoking cessation interventions. In Denmark, four municipalities have joined in a health community to optimize and implement smoking cessation interventions for this group. These interventions integrate interdisciplinary competencies for very socially vulnerable individuals and are based on evidence-based intensive smoking cessation programs (I-SCI). The objective of this study was to explore the experience of using an intervention specifically designed and structured for very socially vulnerable individuals, considering their social and behavioural needs and report the successful quit rate at the end of intervention and 6-month follow-up.

## Case Presentation

Due to social and behavioural challenges, and to prevent very socially vulnerable individuals from abstaining from participating in a smoking cessation intervention, four municipalities in Denmark aimed to tailor, optimize, and implement a smoking cessation program for participants facing social challenges. The municipalities implemented smoking cessation interventions integrating interdisciplinary competencies for very socially vulnerable individuals.

For patient recruitment, the smoking cessation program primarily recruits participants through referrals from healthcare houses and support persons. Additionally, patients may be referred by job centers, healthcare coordinators, and psychiatric community centers. Therapists facilitate enrolment, with programs alternating between the healthcare communities of the four municipalities.

The smoking cessation program was based on the evidence-based standardized I-SCI). The program features a unique approach, combining specialized social pedagogy and psychologically hazardous cessation therapists with therapists from the pharmacy. This innovative collaboration aims to address barriers related to social anxiety and provide comprehensive support. Pharmacists play a crucial role in educating participants about medication interactions, supporting medication, and the physiological responses associated with cessation. The program's focus on addressing smoking in conjunction with mental illness aims to facilitate participant engagement and success.

Participants who successfully complete the program receive intensified follow-up to support their cessation efforts. Those who discontinue the program prematurely are contacted by social pedagogical staff or therapists for approximately 6-months afterward. However, it is important to note that existing relapse prevention strategies are currently not implemented in the program.

The program is free of charge and offer nicotine replacement therapy without charge. By offering an approach that combines specialized counselling, pharmacist expertise, and intensified

follow-up, the program holds promise for improving patient outcomes and reducing the burden of smoking-related diseases in this vulnerable population. The program is based on the I-SCI a Golden Standard Program, providing patient education about smoking cessation by specially trained staff. Similarities and differences between the program for very socially vulnerable and the standardized I-SCI are presented in Figure 1.

The validated information on interventions for very socially vulnerable individuals included five programs with a total of 37 participants between 2021 and 2023. All participants in the very socially vulnerable intervention were included for 6-month follow-up, however contact was not achieved for one participant. Among the very socially vulnerable, participants were heavy smokers (84%), had a Fagerström score of 7-10 points (64%) and the majority used nicotine replacement therapy (81%), few completed the intervention (46%), the majority had low education levels (75%), and were unemployed (94%). The successful quit rate for smoking at the end of the intervention was 29%. For 6-month follow-up, 36 participants (97%) were successful contacted on follow-up and five (14%) participants in the very socially vulnerable intervention was continuously quitted. One participant was not quitted at the 6-month follow-up but later continuously quitted. The intervention for very socially vulnerable individuals had an overall compliance of 46%, while 65% reported high satisfaction. For participants who complied with ≥75% meeting adherence of the intervention, a higher proportion successfully quitted at the end of the intervention (53%).

| **Standardized intensive smoking cessation intervention** | **Intervention for very socially vulnerable** |
|---|---|
| Free of charge | Free of charge |
| Single municipalities | Collaboration of 4 municipalities |
| 5 meetings in 6 weeks | 8 meetings in 8-9 weeks |
| No contact between meetings | Contact between meetings and reminders of meetings |
| Relapse prevention is recommended 3 months after the quit date | Relapse prevention is recommended 3 months after the quit date |
| Group or individual sessions | Group or individual sessions |
| Structured manual-based patient education | Extended structured manual-based patient education |
| Trained SCI therapist | Trained SCI therapist, specialized social pedagogical and psychologically therapists from the social psychiatry and therapists from the pharmacy introducing social pedagogic “frames” |
| Heterogeneous group | Homogenous group addressing barriers related to social anxiety and provide comprehensive support |
| Self-referral or from healthcare personnel | Referrals from health houses and support persons, job centers, care coordinators, and psychiatric community centers |
| Nicotine replacement therapy consult | Nicotine replacement therapy consult and educating of medication interactions and the physiological responses.<br>Opportunity for buying and delivery of nicotine replacement therapy on location (no need for the individual to go to the pharmacy). |
| Information and education about smoking and smoking cessation interventions | Information and education about smoking in conjunction with mental illness and smoking cessation interventions |
| Follow up at six months | Intensified follow-up to support cessation efforts |

| | |
|---|---|
| No contact to participants who discontinue the program during the 6 weeks intervention | Participants who prematurely discontinue the program are contacted by social pedagogical staff or therapists during the 6 weeks intervention |
| Offering re-intervention at 6-month follow-up for those who still smoke | Offering re-intervention at 6-month follow-up for those who still smoke |

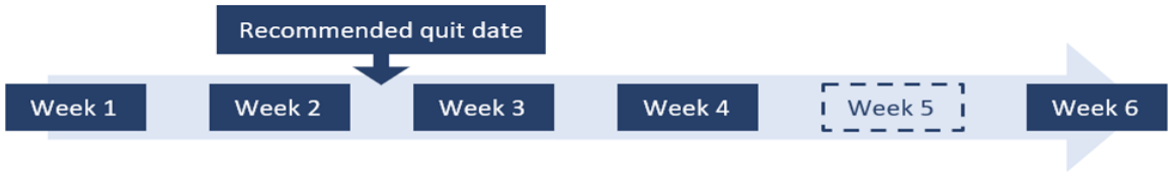


**Figure 1:** Intensive standard program by very socially vulnerable and standardized intensive smoking cessation intervention in Denmark.

## Materials and Methods

This study utilized data from the STOPbase for tobacco and nicotine, a comprehensive database containing information on cessation interventions across Denmark [17]. The STOPbase contains information from 94 out of 98 municipalities in Denmark, providing a robust source of information on tobacco and nicotine cessation efforts [17,21].

Data included in the STOPbase spanned from January 2006 to June 2023, with records beginning from the initiation of the database. Participants' CPR numbers were included for identification and tracking purposes. Follow-up data were collected for a duration of 6-months after the planned quit date or end of intervention to ensure adequate monitoring of participants' progress.

Validated information on interventions targeting very socially vulnerable individuals was obtained through collaboration with four municipalities in Denmark. Validated information on interventions for very socially vulnerable individuals in Denmark was available between 2021 and 2023.

## Outcome Measurement

The primary outcome of interest was the successful cessation of smoking. Successful quitting was defined as self-reported abstinence from smoking at the end of the intervention and continuous abstinence at the 6-month follow-up. Trained STOP-therapists conducted interviews with participants, according to their preferences, either through face-to-face meetings or phone calls. Participants were contacted a maximum of four times in 5-7 months after the planned quit date or the end of the intervention.

## Discussion

In total 37 individuals participated in an optimized smoking cessation program for very socially vulnerable individuals. By integrated interdisciplinary competencies to address social barriers and provide comprehensive support 1 out of 3 managed to successful quit smoking at the end of the intervention. For 6-month follow-up, 5 remained continuous abstinent.

The general STOP base population would not typically receive encouragement and support from social services but almost all of the general population participating in standardized I-SCI were encouraged by the healthcare system, exclusively.

For smoking cessation in Denmark, 26,039 participants attended a standardized I-SCI between 2021 and 2023. A minor proportion (5%) did not want the 6-month follow-up while only one participant was not reached for follow-up of very socially vulnerable (3%). Other differences were the successful quit rate for smoking at the end of the intervention at 51%, 65% for participants who complied with ≥75% meeting adherence and 38% at 6-month follow-up for the general population of smokers being older of age, mainly women without heavy social vulnerability.

The smoking cessation program for very socially vulnerable offers an approach, combining specialized counselling and pharmacist expertise to address smoking cessation in very socially vulnerable individuals. By combining specialized counselling and pharmacist expertise, the program goes beyond traditional cessation methods to provide personalized support that considers the unique challenges faced by these individuals [22,23]. Smoking cessation requires a nuanced understanding of the psychological, social, and pharmacological aspects of addiction [1,4,11,12,13]. The program was designed to embrace the special needs participants may have, understand, and enhance the standardized I-SCI to participants achieving continuously successful quitting of smoking. The intensified follow-up ensures ongoing support for participants, contributing to the program's overall effectiveness in promoting smoking. The handling of this challenge was evident in the high proportion of participants who accepted follow-up after 6-month (97%) and reflected the standardized intervention (95%). An

important addition to this was that the very socially vulnerable participants only wanted contact and were in general skeptical about sharing information and data with anyone other than their specific therapist. This continuous engagement plays a crucial role in sustaining motivation, addressing relapse triggers, and reinforcing positive behavioural changes. By maintaining regular contact with participants and providing access to resources and assistance, the program maximizes the likelihood of long-term success in smoking cessation. Further, a major challenge for this very socially vulnerable group included the dependency. However, this report on successful smoking cessation in very socially vulnerable shows ongoing challenges and that the proportion of successful quitting seems disproportionately low. Similar low quit rate was experienced in vulnerable participants of a community-based smoking cessation program in the Netherlands [24].

A systematic review and meta-analysis assessed the methodological quality and effectiveness of behavioural smoking cessation interventions targeting serval disadvantaged groups. Of the included studies 13 out of 32 were randomized controlled trials (RCT) examining the most effective smoking cessation strategies. While behavioural smoking cessation interventions appear promising for some very socially disadvantaged groups, the overall findings are inconsistent [2,3]. Additionally, another systematic review of peer support interventions, including all but one RCT's, revealed that interventions enhancing social support are particularly crucial for disadvantaged groups, due to the individuals often have limited access to informal support [3,14].

A limitation of a case report is the generalizability of the findings. The strength is that the intervention for very socially vulnerable was specifically designed to address the unique needs for these individuals and validated by the four municipalities, providing an insight into the tailored approaches for this population. The study provided a direct comparison between the intervention for very socially vulnerable and the standardized I-SCI.

Despite the program's strengths, achieving successful smoking cessation in very socially vulnerable populations remains a challenge and underscores the need for further research and innovation in this area. Future iterations of the program could explore additional strategies as peer support and relapse prevention for tailoring interventions to the specific needs of different subgroups within the very socially vulnerable population. This case shows the potential for further research e.g. a feasibility study within the very socially vulnerable group.

## Conclusion

In conclusion, the smoking cessation program for very socially vulnerable populations represents an important step towards addressing the complex barriers to entering and quitting smoking among individuals who is very socially disadvantaged. However, continued efforts are needed to overcome remaining challenges and further optimize the program's effectiveness in promoting successful smoking cessation.

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**Ethical Considerations:** Approval from ethics committee was not required according to Danish law. The study was approved by the Danish Data Protection Agency (P-2021-900).

**Conflict of Interest:** All authors report no conflict of interest.

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