Suicidology Online 2017; 8:19

Suicidology Online
open access journal
www.suicidology-online.com

ISSN 2078-5488

Original research

Effect of treatment on patients in preventive suicidal care in Denmark – a 20-year follow-up

B. D. Lind[1]; P. Wiberg-Larsen[2]; E. N. Stenager[3]

[1]Department of Psychiatry, Clinic of Suicide Prevention and Treatment for Adults, Region of Southern Denmark, Denmark;
[2] Aarhus University, Institute for Bioscience, Denmark;
[3]Research Unit og Mental Health, Institute og Regional Health Services, University of Southern Denmark, Odense, Denmark.

Submitted to SOL: November 3rd 2016; accepted: May 23rd 2017; published: August 13th, 2017

Abstract**:** Self-harming persons have a significantly increased risk of remitting themselves to death by suicide. Evidence derived from effective preventive efforts concerning deliberate self-harm is limited and contradictive, calling for alternative research designs for evaluating the provided treatment. The present study uses register data on treatment of self-harm to analyse characteristics of the patients, effect of treatment, compliance and reduction of deliberate self-harm episodes.

Method: We used a dataset from The Clinic of Suicide Prevention, Odense, consistently updated since 1992. A total of 3037 patients treated after an incident of deliberate self-harm were investigated targeting a subpopulation of patients (N = 377) with multiple treatments over a period of 20 years.

The methodological approach was mixed design.

From the subpopulation (377 multiple treatments), 56 treatment case records (3+ treatments) were reviewed using qualitative thematic analysis.

Principal Components Analysis (PCA) was used on a reduced dataset of 2122 patients, including 31 relevant patient characteristics, to identify main principal factors that might be important as triggers of self-harm.

Results: From the qualitative analyses two major themes were recognized: Patients social and psychological problems and their relation to psychotherapeutic treatment, as well as compliance. The PCA showed significant similarities between single and multiple users of treatment, indicating that conclusion from the qualitative analyses on the last group might be extrapolated to the former. Chronic illness with pain was shown to be the main factor with affiliation to increasing age and loneliness.

Discussion: The study demonstrates connection between social and psychological characteristics, compliance and profit of treatment. Psychotherapeutic treatment reduces number of deliberate self-harm episodes. Therapeutic treatment tools can be traced in improved relational skills. Patients use easy access to help as a way of handling life with suicidal ideation and deliberate self-harm.

Keywords: suicide, deliberate self-harm, triggers, co-morbidity, treatment, effect

✉Corresponding Author: MSc Bertel Dam Lind, Department of Psychiatry, Clinic of Suicide Prevention and Treatment for Adults, J. P. Winsløwsvej 18, bygn. 220, 5000 Odense C., Denmark. Email: berteldamlind@gmail.com

Deliberate self-harm (defined as an acute non-fatal act of self-harm carried out deliberately in the form of an acute episode of behaviour by an individual with variable motivation (Soomro & Kakhi, 2015)) occurs frequently although it is

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

difficult to estimate the exact numbers. Based on the "National Register of Patients and Register of Suicide Attempts" it is roughly estimated that at least 8-10,000 episodes of deliberate self-harm take place each year in Denmark (Morthorst et al, 2016). People who self-harm have up to a 60-fold higher risk of death by suicide noted during the first 5 years after an index episode of deliberate self-harm when compared to the general population in Denmark (Christiansen & Jensen, 2007).

Evidence of effective preventive efforts is limited and contradictive (Wilkinson, 1994; WHO, 2010). Prevention of suicidal behaviour remains challenging, although there are good results for cognitive behavioural therapy (Meerwijk et al., 2016). The main reasons are inadequate sample sizes of randomised, controlled studies, and too short follow-up periods (e.g. Gunnel & Frankel, 1994; Crawford et al., 2007; Gouldney, 2005). Danish studies, examining the effect of treatment on people at risk of suicide, have suffered from limitations due to sample size and methodological problems distinguishing experimental treatment ("new treatment") from standard treatment ("treatment as usual (TAU)") (Nordentoft, 2007). Randomised clinical trials have, furthermore, proven difficult to replicate in terms of effects (Hvid & Wang, 2009; Morthorst et al., 2012). An additional challenge is that randomised studies are expensive and complicated to carry out in a multifactorial environment as therapy.

Despite these limitations, new national research, including data from the present study, indicates that treatment reduces mortality rate as well as rate of suicide attempts (Erlangsen et al., 2014, Birkbak et al., 2016). However it is still not known exactly how treatment positively affects the individual patients. This may call for other types of research designs for evaluating the provided treatment (Hadlaczky et al., 2011). Naturalistic qualitative research into on-going treatment as well as research aiming at generating and testing hypotheses might bring new insight (Hjelmeland & Knizek, 2010).

The Clinic of Suicide Prevention (CSP) in Odense, Denmark, has offered psychosocial therapy for a large number of people with deliberate self-harm and risk of suicide since 1992 (Stenager, 1996). The therapy has been focused on acute suicide prevention, combining different therapeutic strategies including cognitive, problem-solving, crisis therapy, integrated care, psychodynamic, systemic, and psychoanalytic approaches, although it has not followed a strict uniform protocol. Different therapeutic measures were chosen in cooperation with the patient in question after an evaluation of the main issues. Treatment has consistently included up to ten sessions. This treatment scheme was implemented as a national standard in 2007 (Sundhedsstyrelsen, 2007).

Previous national research on suicidal behaviour has primarily been based on Danish national registers (Christiansen & Jensen, 2007), and only peripherally on the unique CSP dataset, although this is especially suitable to detect permanent effects of treatments over longer follow-up periods. Further, assessing patients who receive multiple treatments might contribute to the understanding of the effect of treatment by giving the opportunity to follow and compare several treatments of the same patient over longer time. Repetition of self-harm episodes can be compared within and across treatments in order to reveal elements of treatment that may reduce the rate of repetitive deliberate self-harm episodes. Finally social, psychological and demographic changes can be monitored over longer periods detecting effects of self-harm episodes.

The aim of the present study was to identify: (1) social, psychological and demographic differences between patients with one versus two or more treatments at the CSP after deliberate self-harm, (2) effects of treatment on remission by examining length of treatment and time between treatments among patients with two or more treatments, and 3) specific elements of treatment that might prevent repetition of self-harm behaviours.

In order to link results from the qualitative part of the study with the quantitative results, we hypothesize that underlying factors leading to self-harm are similar independently of whether the patients used the CSP treatment once or repeatedly. We furthermore hypothesize that evidence of effects of treatment on repeated users might be extrapolated to those that only receive a single treatment (and never returns).

Method

A mixed methods design was applied, using both quantitative and qualitative data and analyses (Creswell, 2009). Data consisted of responses from a clinical questionnaire that consistently has been applied to all patients receiving treatment in CSP since 1992. In this study, 3037 interviews (being equivalent to the same number of patients) and covering the period 1992 – 2011 have been used. The clinical questionnaire includes 72 variables that may be ordered into 46 key item characteristics. The questionnaire has been developed from "The European Parasuicide Study Interview Schedule" (EPSIS), a *WHO/EURO Multicentre Study on Parasuicide* standardised

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

questionnaire (Bille-Brahe et al, 1996). We selected 31 variables for the study (of the total 72 variables) regarded as not redundant, important and relevant. The variables are presented in Table 1.

The sample included people who had contact to CSP for adults in Odense after an episode of deliberate self-harm since 1992 (Stenager, 1996). From 2007 the clinic focused exclusively on adults aged 18 years or older as treatment of adolescents was moved to its own department. Younger patients (age 10-18) from 1992-2007 were only sparsely represented. Patients with serious mental illness as schizophrenia, severe depression and chronic drug addiction were, however, not offered treatment at CSP. Treatments were conducted by psychiatrists, psychiatric nurses and social workers, all with special education and training aimed at deliberate self-harm and suicide prevention. A "treatment" was defined as a series of psychotherapeutic sessions, typically up to ten. Each treatment was defined by a start and end date in the database. People who only attended treatment at the clinic once were thus considered as having had 'one treatment' while people who later returned for a second or subsequent treatment were considered as having had 'two or more treatments'.

The project was approved by the Danish Patient Review Board (3–3013–204), the Danish National Board of Health**5** (6–8011–834), and the Danish Data Protection Agency through Capital Region of Denmark (RHP-2012–01). In view of the obtained permission to use recorded data, informed consent from participants was not required.

Quantitative analyses

We used Principal Components Analysis (PCA) to identify overall relations between the selection of 31 variables (Table 1), aiming at identifying the most important triggers of deliberate self-harm. The main principle of the PCA is that variation of the originally selected variables is explained by a series of new constructed variables each representing axes in a multidimensional ordination. The number of axes is equivalent to the number of variables in a multiple regression. First axis (PCA1) represents the highest explanatory value, while the second axis (PCA2) represents the next highest explanatory value and so forth. Altogether the axes explain 100% of the variation of data. Typically, only PCA axes 1, 2 and 3 are presented as the outcome. For the PCA, a reduced dataset of 2,122 patients and 31 variables was used for whom complete information on all variables was available (Table 1). Most variables were binary while data on age and Pierce intention scale (Pierce 1977) was normalised to values between 0 and 1. Analyses were carried out using the software PCord (McClune &Mefford 2011). Further, correlations between single variables were calculated using SigmaPlot software (SYSTAT, 2017). Correlations with $p < 0.001$ and r-values (Pearson product moment values) ≥ 0.50 were regarded as statistically significant considering the high number of patients in the data set.

Differences between patients with one and two or more treatments with respect to age, gender and treatment characteristics were tested using Chi^2-test supplemented by Z-test using SigmaPlot software. Depending on the number of patients significance was accepted at $p < 0.05$ ($N < 100$), and $p < 0.001$ ($N > 100$) (Table 2).

Table 1
Variables with corresponding coding used in the PCA analysis.

Variables	Codes
Sex	SEX
Age	AGE
History of deliberate self-harm prior to index attempt	PATT
Suicidal behaviour family	ATFAM
Alcohol	ALC
Pierce (Pierce, 1977)	PIE
Self-reported problems leading to suicidal ideation/behaviour:	
-Problems with partner	PPa
-Problems with parents	PPr
-Problems with children	PCH
-Problems with friends	PFR
-Loneliness	LONE
-Lovers rejection	LRE
-Physical illness	PIL
-Mental illness	MIL
-Problems at work	PWO
-Unemployment	UNE
-Addiction	ADD
-Economic problems	ECP
-Crime	CRI
-Pain	PAI
-Bereavement	BER
Civil status:	
-Single	SIN
-Cohabit	COH
-Separated	SEP
Education	EDU
Illness diagnosed	ILL
Chronic illness diagnosed	CHR
Pain (general)	PAIg
Diagnosis (psychiatric)	DIA
Treatment ended prematurely	TIN
Group of patients	GROUP

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

Table 2
Differences related to gender and age group at first treatment contact between groups of patients with multiple and single treatments. Data derived from the Suicide Preventive clinic in Odense (Denmark) during 1992-2011. Level of significance: P < 0.05* for N < 100 and P < 0.001*** for N > 100.

Characteristics	Patients with multiple treatments, N = 377 (%)	Patients with one treatment N = 2,650 (%)
Gender		
Male	122 (32.4)	795 (30.0)
Female	255 (67.6)	1855 (70.0)
Age at first treatment contact		
10-19	56 (15.9)	319 (14.5)
20-29	102 (29)	654 (29.8)
30-39	86 (24.5)	449 (20.5)
40-49	75 (21.4)	410 (18.8)
50-59	15 (4.2)*	222 (10.1)***
60-69	9 (2.6)	84 (3.8)
70+	5 (1.4)	52 (2.5)

Qualitative analyses
Supplementary to the clinical questionnaire, case records on 56 patients with three or more treatments were used in the qualitative analysis. For reasons of feasibility and in order to focus exclusively on patients with a more chronic self-harm profile, those with two treatments were excluded for this analysis. An initial investigation into cases with only two treatments revealed that a major part of these were not related to separate incidents but were shortly aborted treatments on the same issue. A criterion of one years separation between treatments were therefore implemented to secure that developments of patients could be detected.
Individual case records were reviewed using thematic analyses (Braun & Clarke, 2006) in an iterative process where cases were examined one by one, coded and categorized in order to extract themes to compile a list. Subsequently, all cases were re-assessed to ensure that no themes had been overlooked. After 48 cases, point of saturation of themes was reached of the total 56. Finally, only themes with a general representation (presences in ≥ 14 of 56 patients; equalling 25%) were included.

Results

Quantitative study
During 1992-2011, a total of 3037 patients received treatment at the CSP in Odense after an incident of deliberate self-harm. In all, 377 patients received two or more treatments (N=848) while 2,650 were recorded with one treatment only. The first three axes in the PCA (Figure 1) explained 26.9% of the variation in data sample, axes 1, 2 and 3 explaining 13.9, 7.9, and 5.7 % of the variation, respectively (Table 3).
The variables mental illness, physical illness, chronic disease, pain, and bereavement were all positively correlated with PCA axis 1 (r = 0.69-0.79), implying that these factors were overall significant for self-harm episodes and long-time suicidality as well, while age was positively correlated to a lesser degree (r = 0.61), indicating that chronic disease, pain and bereavement bear significance through age groups. Being single was negatively correlated with axis 1 (r = -0.50). The variables mental illness, physical illness, chronic disease, pain, and bereavement were overall inter-correlated (r > 0.54, results not shown), implying that these factors were overall significant both as risk factors and as direct triggers for self-harm episodes.
Problems with parents, problems with friendships, lover's rejection, and being single were all positively correlated with PCA axis 2 (r = 0.50 - 0.56) (Table 3). None of the variables were, however, significantly inter-correlated (results not shown). Overall, the PCA axis 2 clearly expressed problems with social relations as triggers but probably less as background factors.
No variable was significantly correlated with PCA axis 3 (Table 3), although economic problems were relatively close to (r = -0.44). Economic problems seem to be an important background factor but not significant.
The PCA analyses further revealed that number of treatments (one or two/more) was not correlated to either of the first three axes, or to any of the other variables, showing a consistent picture of what might induce deliberate self-harm. This is

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

illustrated in Figure 1 showing a similar distribution of patient scores between the two groups (with one or two/more treatments).

Figure 1

Distribution of patients with 1 and 2+ treatments showing the significance of 31 different explaining variables (for explanation of coding see table 1).

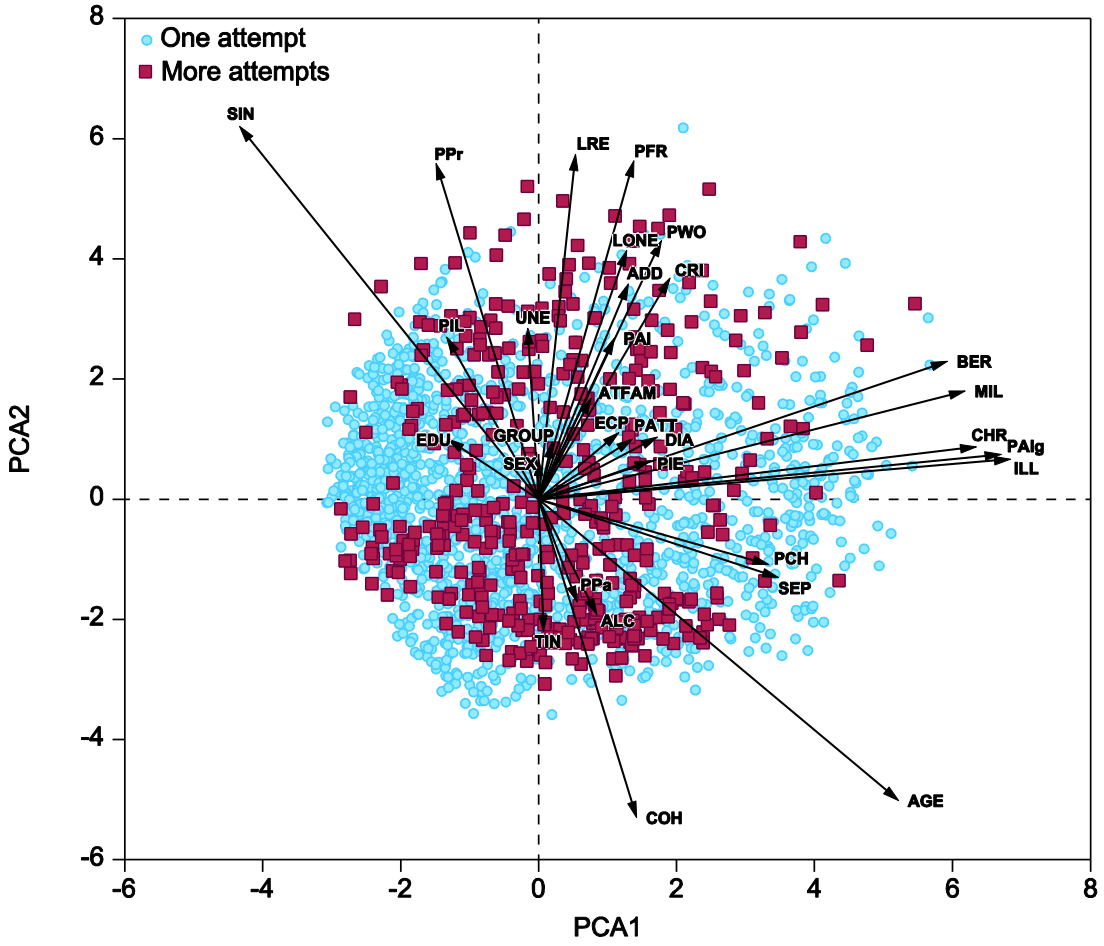


Table 3

Result of Principal Components Analysis (PCA) of 2,122 patients attending 1-7 treatments targeting the related variables that were significantly correlated (except one) with at least one of the first three PCA axes (Pearson's r). Significant values marked in bold. Significance level: r ≥ 0.50 /< -0.50 and P < 0,001.

Variables	PCA1	PCA2	PCA3
Age	**0.605**	-0.450	-0.206
Problems with parents	-0.173	**0.501**	0.093
Problems with friendship	0.162	**0.505**	-0.221
Lovers rejection	0.062	**0.514**	-0.170
Mental illness	**0.717**	0.161	0.302
Economic problems	0.135	0.099	-0.441
Bereavement	**0.687**	0.206	0.209
Single	**-0.503**	**0.556**	0.374
Illness diagnosed	**0.793**	0.060	0.315
Chronic disease	**0.735**	0.078	0.309
Pain in general	**0.777**	0.067	0.312
Variation explained (%)	13.7	7.9	5.7

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

A supplementary univariate analysis of the two groups showed no significant differences in relation to gender (Chi^2-test, $p > 0.001$), but significant overall differences in age at admission to treatment (Chi^2-test, $p < 0.001$) (Table 2). However, according to Z-tests on the different age-groups, only the age group 50-59 showed a significant difference between groups of patients with multiple and single treatments, respectively ($p < 0.001$), patients with only a single treatment having a higher representation.

Review of cases

For 56 patients with three or more treatments, case records were reviewed to identify persistent themes. In all, 40 different themes emerged, which were condensed into eight meta-themes: treatment characteristics, consequences of treatment, history of deliberate self-harm, risk factors, education and social status, childhood, reasons for deliberate self-harm, and feelings (Table 4).

Table 4

Themes from the case record analysis of patients with three or more treatment contacts.

History of suicidal behaviour	Admission with deliberate self-harm	Admission with suicidal ideation	Previous deliberate self-harm	Suicide in family	Suicide among friends
Risk factors	Alcohol/ drug misuse	Violence and trauma	Mental illness	Cohabitation breakup	Relationship breakup
Education and social status	Unskilled	Unemployed	Social pension	Marital status	Sick leave
Childhood	Neglect and abuse	Alcohol/drug misuse in family	Violence and trauma	Parental divorce	Childcare/ Foster home
Reasons for deliberate self-harm	Problems related to lover or partner	Problems related to offspring	Loss by death	Bullying	Physical illness
Feelings	Hopelessness/ Sadness	Anxiety	Jealousy	Guilt/shame	Loneliness/ rejection
Treatment characteristics	Number of treatments	Timespan between treatments	Total of treatment years	Number of sessions	Referral site
Consequences for treatment	Easy access to treatment important	Discontinuity of treatment	Focus on specific tools	Short but repeated treatment	Lifelong

Patients with three or more treatments could be divided into two distinct categories based on treatment characteristics: Category 1 included patients who had attended two or more treatments at the clinic within less than one year and where contacts seemed to be related to the same event, i.e. one continuous treatment (N = 6, 10.7%). Category 2 consisted of patients with several treatments spread over longer time intervals and related to separate events (N = 50, 89.3%). The majority of patients returned for a subsequent treatment after longer intervals (range: 1 – 16 years).

Length of treatment was significantly reduced inversely proportional to distance to index (i.e. first admission), following a power function ($r^2 = 0.90$, $P < 0.001$) (Figure 2). Thus, duration of treatment for category 2 patients with multiple but separated treatments was markedly shorter than for category 1 patients with continuous treatment contact and shorter than the mean treatment length for the entire investigated population (N=3,037).

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

Figure 2
Number of sessions plotted in relation to time between repeated treatment contacts for patients with three or more treatments (dots represent average number of sessions within a treatment for the first five repeated contacts).

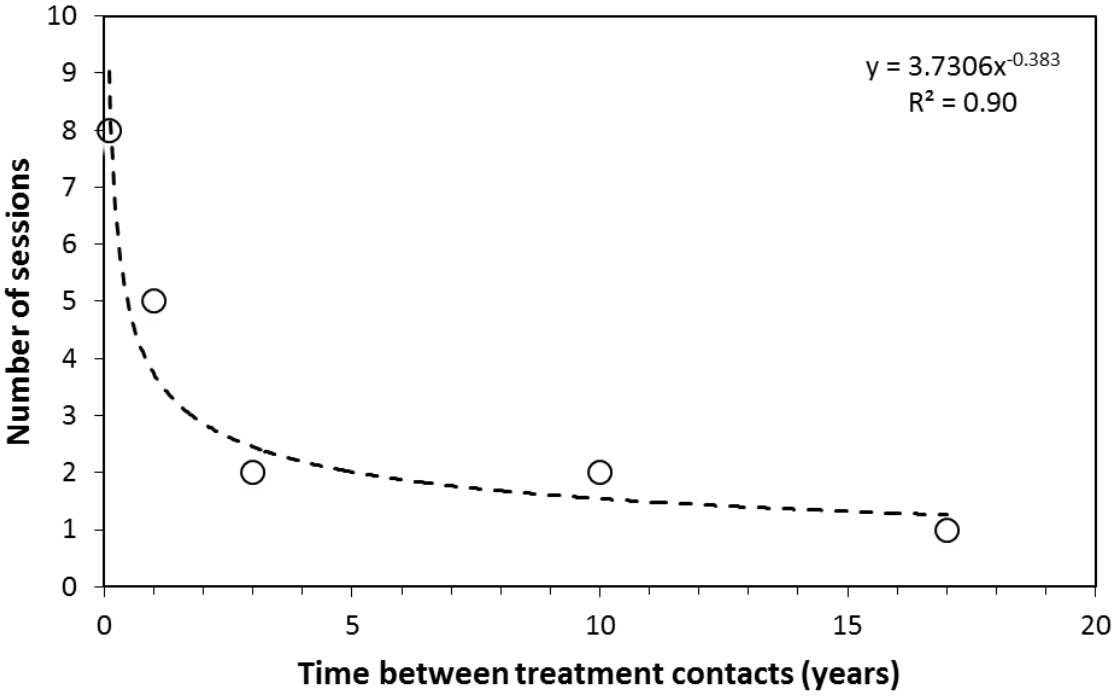
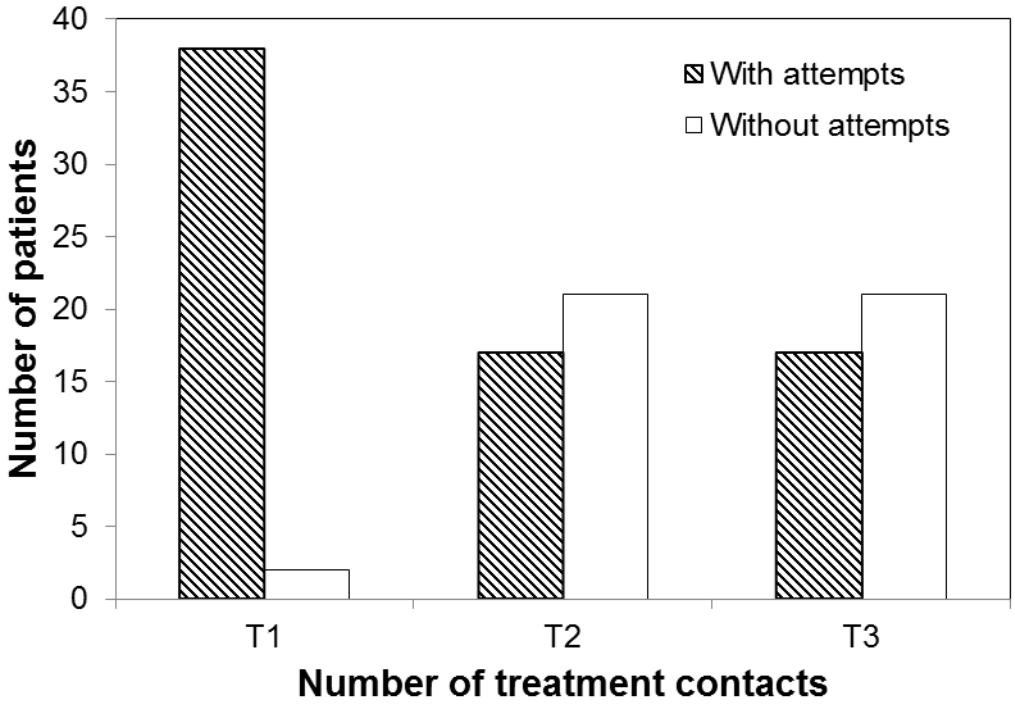


Figure 3
Distribution of cause for treatment for patients at the Suicide Preventive Clinic for adults, Odense (n=40). Only the first three treatment contacts (T1 – T3) are used, as only very few received 4 or more treatments.



Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

Generally, the initial treatment was longer than following treatments (data not shown). Further, treatments were often interrupted by patients after a few contacts (Figure 2). In addition we saw a markedly lower number of repeated self-harm episodes following the index attempt (Figure 3).

Patient records reported progress over time. Suicidal thoughts did not result in severe self-harm but in renewed contact to treatment. They also provided insight into the lives of patients between treatments especially with respect to key behavioural problems, and it seemed evident that patients actively use techniques and insights obtained through treatment. Patients used the therapeutic tools for management of impulsivity that they learned through treatment. They enhanced their ability to monitor early signs of renewed self-harm tendencies and thereby reduced the impulsive character of their behaviour. Even the ability to reflect was strengthened in some patients and they improved their ability to turn a downward spiral of rumination and tested their thoughts realistically in relation to the actual situation, using problem-solving and cognitive tools.

The long and longer periods between treatments were seen as signs of improved ability to handle the relational conflicts, which patients themselves pointed out as outcomes of treatment. Their personal relations tended to become of longer duration and were calmer. Break up of relations forthwith made suicide thoughts arise anew, which lead to renewed contact.

The detailed study of the subset of 56 patients (cases) revealed interesting social and psychological similarities among the patients. Most of them (N = 41) were unskilled and were or became unemployed within few years after the index attempt and many ended out on social benefit or social pension (N = 33). Thus, the index attempt not only seemed to be an indicator of repetitious behaviour but also of social decline.

Violence in childhood was reported in 16 cases and partner violence in 25 cases with a strong link to alcohol intake. In 64 contacts (out of 206) alcohol or drugs were reported as a contributing factor to suicide attempt or ideation. The majority of the patients reported neglect, violence, alcohol problems and a general lack of predictability in their family history. In 16 cases, children of the patients were under supervision of the authorities or placed in foster care/institution.

Most patients were diagnosed with personality disorders as dependent or passive/aggressive disorder, few with emotional instable personality disorder - borderline type, while the majority of patients from time to time were diagnosed moderately depressed (according to ICD 10, WHO). Diagnoses of the individual patient often changed from treatment to treatment, probably as a result of the difficulty of diagnostics with patients in crisis. Compliance with medical treatment with SSRI (Selective Serotonin Reuptake Inhibitor) could not be determined with any certainty as it was uncertain whether patients followed medical instructions over time. Often patients stopped and reengaged in medical treatment on their own without consulting medical help.

Patients did not follow treatments of longer duration in psychodynamic and cognitive settings, either because they did not meet diagnostic criteria for inclusion (i.e. emotional unstable personality disorder, borderline type, affective disorder) or due to instability in their contact when admitted (i.e. longer periods of non-attendance that lead to exclusion).

Almost all patients (85%) reported relational problems as primary cause for their deliberate self-harm episode and suicide ideations. They experienced loss of girl or boy friend, separation from spouse or cohabitant and serious disagreements in their relations. Death of relatives or other close relations and loss of contact to children seemed to play an important role as well.

Discussion

Overall, the two groups of patients in the CSP treatment programme (those with only one entrance into treatment and those with multiple treatments) proved to be comparable in regard to demographic, social and psychological characteristics. The comparability of the two groups supports our hypotheses and the extrapolation of data on multiple users to those of single users.

Chronic disease, which involves pain, has previously been shown to be a significant trigger of suicidal behaviour (Stenager et al., 2013; Qin et al., 2014). Furthermore, the present study seems to support the hypothesis of Qin et al. (2014) that presence of psychiatric problems (i.e. suicidal behaviour/deliberate self-harm) prior to upstart of chronic disease is a moderator as to completed suicide. The present study contributes with important information on the relation between chronic illnesses and self-harm for patients in a long-term perspective. Getting the diagnose and the perspective of a chronic illness triggers self-harm behaviour and significantly rises the likelihood of suicide, but what is apparent from this study is that living with the chronic illness gives

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

a life with constant self-harm behaviour that treatment can minimize. It is worth mentioning that the importance of chronic disease combined with social problems are often missed in psychiatric therapy as well as in somatic treatment of patients with chronic disease that has a social element to it, such as COLD, diabetes and rheumatic illnesses (Stenager & Stenager, 2000). Our study further revealed the importance of relational problems as triggering factors (problems with parents, lost friendships, lowers rejection, and loneliness).

Overall the qualitative research into case records confirmed the results of the PCA (Table 3 and table 4), although the picture arises that patients with multiple treatments might belong to a socially exposed group (i.e. on social benefit, social pension etc.). Their upbringing had strong elements of violence, alcohol, abuse and broken homes, a picture that is sustained by other research into the relation between trauma and suicide ideation (Belik et al., 2007), and between physical and sexual abuse (Joiner et al., 2009) as well as investigation into familial background, i.e. correlation between childhood environmental conditions and present social status (Melhem et al, 2007). This apparent deviation from the results of the PCA showing little or no difference between the two groups probably constitutes a difference in depth and duration of problems rather than in character of problems, reflecting the importance of in depth research into the individual patient. From the long-term study of patients it was apparent how their individual risk factors developed and operated as triggers over time, and particularly how relational factors became a major triggering factor irrespective of background factors.

Problems tend to accumulate and achieve a character of inevitability or destiny in the mind of the patient. The concept of poly victimisation (Finkelhor et al., 2009) seems to frame their lives and explain their feeling of being trapped in a fatal destiny, perceived as a series of failures. Significant life events were more frequent and had graver consequences mainly due to the psychological profile of the patients as also noted in the study of Yen et al. (2012). But in spite of their difficult lives most cases revealed that patients eventually found a relatively calm and stabile level of life although on a lower social level. As this study probably is the first of long-term effects of treatment on patients with deliberate self-harm, we have not been able to pinpoint specific references. For patients with affective and anxiety disorders, our findings is, however, supported by other studies (e.g. Lopez-Castroman et al., 2011).

The study of patient records contributed with important information concerning characteristics and outcome of treatments. It supported the assumption that treatment reduces deliberate self-harm episodes for the majority of the patients (Figure 2), mainly because patients learn to return to treatment when suicide thoughts reappear, but before they repeat self-harm. Incidents of deliberate self-harm prior to treatment contact dropped to about half from first to second treatment, and this reduction was maintained over following treatments as well (Figure 2). Further, risk of death by suicide seemed reduced as only 2 of the 377 patients actually died by suicide during the 20-year period of study. These patients died late in the course of consecutive treatment (after 4 and 12 years, respectively). This finding is in accordance with the results from the Danish national research programme showing that treatment reduces suicide behaviour and provides help that bears over time (Erlangsen et al., 2014; Birkbak et al., 2016), probably reducing the social consequences of suicidal behaviour, social problems and psychiatric illness.

Treatment and its character of open access seems to function as a “significant other” who is available when life gets tough, and who listens and provides tools for handling life and relations. The patients tend to remember where to turn to even after longer time spans, and they seem to use the possibility for renewed contact as a way of handling suicidality. It is known from other studies that easy access to treatment plays a prominent roll (Leo & Sveticic, 2010; Shneidman, 1998; While et al., 2012). This was supported by our study where number of sessions per treatment was reduced and time span between treatments increased over years indicating that life steadied continuously and that less and less effort was needed to re-establish control. As patients usually reengaged in contact on their own initiative, it might indicate that they, despite interrupted contact, could establish a relation to treatment that lasted over time.

The markedly lower number of repeated self-harm episodes following the index episode seems to strengthen an assumption of treatment as a preventive measure lowering the proneness for repetition. The long and longer periods between treatments are signs of improved ability to handle the relational conflicts, which patients themselves pointed out as outcomes of treatment. Their personal relations tended to become of longer duration and were calmer.

Patients used the therapeutic tools for management of impulsivity that they learned through treatment. This is of utmost significance as

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

patients might live with severe thoughts for longer periods, and the actual deliberate self-harm episode may to be seen as an impulse by patients. Thus, the ability to monitor and stop such an impulse is preventive. Even the ability to reflect was strengthened in some patients and they improved their ability to turn a downward spiral of rumination and test their thoughts realistically in relation to the actual situation. These findings are well supported by Stellrecht et al. (2006).

Difficulties with treatment compliance appear to be crucial to a number of the chronically suicidal patients. When admitted into treatment they have a tendency to drop out of treatment before time, often without notion. It seems difficult for them to be admitted to and to meet demands of longer therapeutic treatment. This behaviour might be explained by studies of personality and cognitive processes (e.g. O´Connor et al., 2008), showing strong correlation between a tendency to ruminate in a downward negative spiral of thought (brooding) and suicidality, while reflectivity gives the opposite effect. The tendency to rumination can also indicate bad reflective ability (Williams, 2005) and thereby excludes patients from treatment that demands ability to reflect.

Strengths and limitations of the present study

PCA was selected as it is frequently used in natural and social sciences to explain compliance between social/environmental factors (variables), but has to our knowledge not received attention in studies within suicide research. Taking the large number of variables into account the variation explained by the first three axes was high, and the results were therefore suitable to gain insight of the factors that might trigger deliberate self-harm/suicidal behaviour and ideation.

The long treatment period and the large number of patients are major strengths of this study. The different methodological approaches applied are an additional strength as they together provide a wider perspective.

There are, however, several limitations to acknowledge. The representativeness of study is limited by the exclusion of important groups, i.e. patients with psychosis, chronic alcohol and drug abuse. Furthermore, the retrospective design made it impossible to assess the uniformity of the provided treatments.

The reliability of the data from the case records might be questioned due to reporting bias. Nevertheless, it seems reasonable to use data as the events have been evaluated and recorded when they took place. The case record might be guided by the therapeutical setting, but in its attempt to establish an understanding of the deliberate self-harm episodes it shows similarities to a research interview by having the statements of the patients presented prior to interpretation. (Foucault, 1974; Hunter, 1991).

Perspective

The study contributes significantly to our knowledge about self-harm/suicide prevention treatment. It provides important information on chronic self-harm patients and their lives with self-harm and suicidality. Therefore, further research should focus on how to enhance compliance by adjusting treatment to different needs and capabilities of the patients. Improved diagnostics might be a key to this differentiation.

Based on the solid evidence of the strong link between physical illness and self-harm/suicidal behaviour from this and other studies, institutions carrying out therapeutic treatment should assess more systematically for self-harm/suicidality in patients with chronic illness that implies pain and screen for physical illness and pain in self-harm/suicide prevention.

Further we recommend that more attention should be given to patients with reluctance to seek treatment and reduced ability to meet the demands of therapy, and that therapy should be adapted to meet their needs and capabilities as well as recognize that treatment for some is not a cure but a lifelong support strategy.

References

Belik, Shay-Lee, Cox, Brian J., Stein, Murray, B., Asmundson, Gordon J.G, Sareen, Jitender (2007). Traumatic Events and Suicidal Behaviour, Results From a national Mental Health Survey. *The journal of Nervous and Mental Disease*, Volume 195, Number 4, April 2007.

Bille-Brahe, U., Kerkhof, A., De Leo, D., Schmidtke, A., Crepet, P., Lönquist, J., Michel, K., Salander-Renberg, E., Stiles, T.C., Wasserman, D. Egebo, H. (1996). A Repetition-Prediction Study on European Parasuicide Populations. *Crisis, 17/1 1996, Hogrefe & Huber Publishers*

Birkbak, J., Stuart, E. A., Lind, B. D., Qin, P., Stenager, E., Larsen, K. J., Wang, A. G., Nielsen, A.C., Pedersen, C.M., Winsløv, J.-H., Langhoff, C., Mühlmann, C., Nordentoft, M. and Erlangsen, A. (2016). Psychosocial therapy and causes of death after deliberate self-harm: a register-based, nationwide multicenter study using propensity score matching. Psychological

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

Medicine, Page 1 of 9. Cambridge University Press 2016.

Braun,V., Clarke,V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology 3*, 77-101

Christiansen, E. & Jensen, B. F. (2007). Risk of repetition of suicide attempt, suicide or all deaths after an episode of attempted suicide: a register-based survival analysis. *Australian and New Zealand Journal of Psychiatry* 41, 257-265

Crawford, Mike J., Thomas, Olivia, Khan, Nusrat, Kulinskaya, Elena (2007). Psychosocial interventions following self-harm. *British Journal of Psychiatry (2007)*, 190, 11-17. Doi: 10.1192/bjpbp.106.025437

Creswell, John W (2009). Research Design. *SAGE Publications Inc*.

Erlangsen, A., Lind, B. D.; Stuart, E. A., Qin, P, Stenager, E., Larsen, K. J., Wang, A., Hvid, M., Nielsen, A. C., Pedersen, C. M., Winsløv, J.-H., Langhoff, C., Mühlmann, C., Nordentoft, M.. (2014) Short and long term effects of psychosocial therapy provided to persons after deliberate self-harm: a register-based, nationwide multicentre study using propensity score matching. *The Lancet psychiatry 2014*.

Finkelhor, D., Omrod, R., Turner, H. and Holt, M. (2009). Pathways to Poly-Victimization. *Child Maltreatment Volume* 14 Number 4 November 2009 316-329

Foucault, M. (1974). The Archaeology of Knowledge. London: *Tavistock Publications*

Gouldney, R. D. (2005). Risk factors for suicidal behaviour: translating knowledge into practice. *Prevention and treatment of suicidal behaviour* (red, Keith Hawton 2005);10:161-182

Gunnell, D. & Frankel, S. (1994). Prevention of suicide: aspiration and evidence. *BMJ*, 308, 1227-1233.

Hadlaczky, G., Wasserman, D, Hoven, C. W., Mandell, D. J., and Wasserman, C. (2011). Suicide Prevention Strategies: Case Studies from across the Globe. *International Handbook of Suicide Prevention: Research, Policy and Practice, John Wiley & Sons, Ltd. 2011*

Hawton, K. (2005). Psychosocial treatments following attempted suicide: evidence to inform clinical practice. *Prevention and treatment of suicidal behaviour* 12:197-219

Hjelmeland and Knizek (2010). Why We Need Qualitative Research in Suicidology. *Suicide and Life-Threatening Behaviour* 40(1) February 2010

Hunter, K.M. (1991). Doctor's stories: the narrative structure of medical knowledge. Princeton, NJ: Princeton University Press 1991.

Hvid M., Wang A.G. (2009). Preventing repetition of attempted suicide – I. Feasibility (acceptability, adherence and effectiveness) of a Baerum-model like aftercare. *Nord J Psychiatry 2009*;63:148-153. Oslo

Joiner, T.E., Van Orden, K.A., Witte, T.K. & Rudd, M.D. (2009). The interpersonal theory of suicide: Guidance for working with suicidal clients. *Washington, DC: American Psychological Association.*

Leo, D. D., & Sveticic, J. (2010). Suicides in psychiatric in-patients: what are we doing wrong? *Epidemiologia e Psichiatria Sociale*, 19(01), 8-15.

Lopez-Castroman, J., Perez-Rodriguez, M. M. Jaussent, I., Alegria, A. A., Artes-Rodriguez, A., Freed, P. Guillaume, S., Jollant, F., Leiva-Murillo, J. M., Malafosse, A., Oquendo, M. A., Prado-Cumplido, M., Saiz-Ruiz, J., Baca-Garcia, E., Courtet, P. and European Research Consorium for Suicide (EURECA). Distinguishing the relevant features of frequent suicide attempters. *Journal of Psychiatric Research* 45 (2011) 619-625.

McCune, B. and Mefford, M. J. (2011). PC-ORD. Multivariate Analysis of Ecological Data. Version 6. *MjM Software, Gleneden Beach, Oregon, U.S.A*.

Melhem, N. M., Brent, D. A., Ziegler, M., Iyengar, S., Kolko, D., Oquendo, M., Birmaher, B., Burke, A., Zelasny, J., Stanley, B., Mann, J. J.. Familial Pathways to Early-Onset Suicidal Behavior: Familial and Individual Antecedents of Suicidal Behavior. *Am J Psychiatry* 164:9, September 2007.

Meerwijk, E. L., Parekh, A., Oquendo, M. A., Allen, I. E., Franck, L. S., Lee, K. A. (2016). Direct versus indirect psychosocial and behavioural interventions to prevent suicide and suicide attempts: a systematic review and metaanalysis. *The Lancet Psychiatry – March 2016*.

Morthorst et al (2012). Effect of assertive outreach after suicide attempt in the AID (assertive intervention for deliberate self harm) trial:

Suicidology Online
open access journal
www.suicidology-online.com
ISSN 2078-5488

randomised controlled trial. *BMJ 2012*;345:e4972 doi: 10.1136/bmj.e4972

Morthorst, B., Soegaard, B., Nordentoft, M., Erlangsen, A. (2016). Nationwide incidence rates of suicide attempt and probable suicide attempts in Denmark during 1994-2011. *Crisis 2016.*

Nordentoft, M. (2007). Prevention of suicide and attempted suicide in Denmark. *Dan Med Bull 2007*;54:306-69.

O´Connor, R. C., Noyce, R. (2008). Personality and cognitive processes: Self-criticism and different types of rumination as predictors of suicidal ideation. *Behaviour Research and Therapy* 46 (2008) 392–401.

Pierce, D. W. (1977). Suicidal intent in self-injury. *The British Journal of Psychiatry 1977*;130:377-385

Schneidman, E.S. (1998). The Suicidal Mind. *New York: Oxford University Press*

Soomro, G M, Kakhi, S (2015). Deliberate self-harm (and attempted suicide). *BMJ Clinical Evidence* 2015

Stellrecht, N. E., Joiner, T. E. & Rudd, M. D.. (2006). Responding to and Treating Negative Interpersonal Processes in Suicidal Depression. *Journal of clinical Psychology*, Vol. 62(9), 1129-1140 (2006)

Stenager, E. N. (1996). Attempted suicide: treatment and outcome. A clinical psychiatric study. *DANISH MEDICAL BULLETIN*, 43(2), 200-201.

Stenager, E. N., and Stenager, E. (2000) Physical Illness and Suicidal Behaviour. The International Handbook of Suicide and Attempted Suicide (eds K. Hawton and K. van Heeringen), *John Wiley & Sons, Ltd, West Sussex, England*. doi: 10.1002/9780470698976.ch22

Stenager E., Christiansen E., Handberg G., Jensen B., Zøllner L. (2013). Suicide and attempted suicide in chronic pain patients. A register study. *Scandinavian Journal of Pain. Epub ahead sept 2013.*

Sundhedsstyrelsen (2007). Vurdering og visitation af selvmordstruede. Sundhedsstyrelsen juni 2007.

SYSTAT (2017). SigmaPlot. Exact Graphs and data Analysis. SYSTAT Software.

Qin, P., Hawton, K., Mortensen, P. B. and Webb, R. (2014). Combined effects of physical illness and comorbid psychiatric disorder on risk of suicide in a national population study. *BJP 2014*, 204:430-435

While, D., Bickley, H., Roscoe, A., Windfuhr, K., Rahman, S., Shaw, J., Appleby, L., Kapur, N. (2012). Implementation of mental health service recommendations in England and Wales and suicide rates, 1997–2006: a cross-sectional and before-and-after observational study. *The Lancet*, 379(9820), 1005-1012.

World Health Organisation (2010). Towards evidence-based suicide prevention programmes. http://www.wpro.who.int/publications/PUB_9789290614623/en/

Wilkinson, G. (1994). Can suicide be prevented? *British Medical Journal*, 309, 860-862

Williams, J., Mark G. Crane, C., Barnhofer, T. and Duggan, D. (2005). Psychology and suicidal behaviour: elaborating the entrapment model. *Prevention and treatment of suicidal behaviour* (red, Keith Hawton 2005);5:71-89

Yen, S., Pagano, M. E., Shea, M. T., Grilo, C. M., Gunderson, J. G., Skodol, A. E., McGlahan, T. H., Sanislow, C. A., Bender, D. S. and Zanarini, M. C. (2012). Recent Life Events Preceding Suicide Attempts in a Personality Disorder Sample: Findings From the Collaborative Longitudinal Personality Disorder Study. *J Consult Clin Psychol*. 2012.