First Step Validation Study for Four Subtypes of Suicidality in Mental Health

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Abstract

Background

Based on clinical experience, a differentiation model for suicidality consisting of four subtypes of suicidality was developed. 1) perceptual disintegration (PD), 2) primary depressive cognition (PDC), 3) psychosocial "turmoil" (PT) and 4) inadequate communication/coping (IC). A study was carried out to examine the validity of the proposed subtypes in absolute/discrete, gradual way and with a self - developed gradual questionnaire.

Objective

A first step was to examine the model and questionnaire for feasibility, reliability and validity in clinical practice. The “real life”, practical application of the model was examined, as were the resulting suggestions for improvement.

Methods

Discharge letters to general practitioners of 25 cases of anonymized suicidal emergency patients were independently reviewed and coded/classified by three psychiatrists, and three nurses. The SUICIDI-2 questionnaire was created to be able to describe our proposed subtypes of suicidal behaviour and was used in this study to allocate cases to these subtypes. Intraclass Correlation Coefficients (ICC) for absolute/discrete and gradual scores were calculated to examine the model’s validity. The study was approved by an ethical board..

Results

All reviewers were able to assign subtypes, using the SUICIDI-2’s absolute and gradual scores, for all cases. We found an average measure of good reliability for absolute/discrete subtypes. For gradual scores, we found excellent average measures for the subtype PDC, and good for the subtypes PD, PT and IC. The reliability of gradual score for the SUICIDI-2 was relatively lower than an alternative gradual scoring, but had a good ICC value for all subtypes. The formulation for PD and IC was discussed with the reviewers and agreement was found about definitions.

Conclusions

The subtypes are validly delineated. After reviewing the results though, we found the interference of substance use was not consistently assessed by all raters. This was grounds to narrow down the criteria of the questionnaire and describe the model more clearly. The SUICIDI-2 questionnaire will be revised. A

follow-up study with more conclusions for validation will looked at in relation to clinical and demographic aspects. It is essential for psychologists and other professionals to be involved in the further development and follow-up of the model and validation.

1. Background

Suicidality includes suicidal ideation, plans, actual suicide attempts and completed suicide. Suicidality is considered a calamity in mental health care, general health care and society in general. In developed countries, the prevalence of suicidal ideation, plans and attempts in the adult population over 12 months is respectively 2.1%, 0.7%, 0.4% [1]. Suicidality is an erratic pattern of behaviour that serves as a precursor to suicide. Suicide is the leading cause of non-natural death worldwide and the second leading cause of mortality in individuals aged 15–29 years [2]. Suicide is widely considered the worst possible outcome within mental health care. The precursor of suicide -suicidality - is complex and multifactorial, and the result of a wide range of interacting psychological, psychiatric, genetic, social, economic, cultural, and other risk factors operating at multiple levels (societal, community, relationship, and individual) [1].

Suicidality is a heterogeneous, seemingly non-consistent phenomenon [3-6] and it is not a clearly well-defined psychiatric symptom. Officially, it only occurs as a symptom in two psychiatric classifications: major depressive disorder and borderline personality disorder [7, 8]. For a number of psychiatric diagnoses though, suicidality is a frequently occurring symptom as is the case for PTSD, sleep disorders and adjustment disorders [9, 10]. Despite the great complexity involved in the assessment and risk taxation of suicidality, there is little empirical research on the differentiation or subtypes of this phenomenon [11, 12].

From a clinical mental health care perspective, several forms of suicidality can be distinguished, while availability of a demarcated description is lacking in scientific literature [4].

To what extent (mental) health workers, the suicidal patient or society are able to take responsibility for safety of a patient during the recovery from a suicidal condition, is something improved differentiation may be able to distinguish ([6] and figure 1).

Guidelines pay much attention to general aspects of the diagnosis and treatment of suicidality, but, apart from making a distinction between an acute and chronic type, they lack a clear differentiation of suicidality [13, 14].

Clinical differentiation of somatic disorders and/or symptoms is important as it contributes to the development and improvement of general medicine and somatic care. Examples are the differentiation and classification of diabetes [15], breast cancer [16] and dementia [17]. More specific subdivisions of somatic symptomatology also exist, like the subcategories of diarrhoea: watery, fatty or inflammatory [18]. Differentiation of disorders has resulted in improved diagnosis, more effective treatment and targeted counselling strategies. Along this line we Extending the concept of differentiation to suicidality: we believe differentiation of suicidality will support improved clinical practice, better risk assessment,

prognosis, etiological knowledge, more accurate scientific research and more effective treatment. Formulation of different levels of responsibility for (mental) health workers will be improved with differentiation of suicidality [19-22].

The experience of entrapment seems to play a crucial role for the aetiology of suicidality as described in the Integrated model of stress vulnerability [23] and the integrated[24] stress-entrapment model developed for the Dutch suicide prevention guideline [25]

So far, we have developed a differentiation model for suicidality, based on both clinical practice [4, 6] and on a theoretical dimensional approach of psychopathology and personality [26]. We discussed the model extensively, tested it with colleagues and patient experts at several conventions, including with a discussion forum in which 50 psychiatrists took part [27], and revised the model accordingly. To be able to research the model, the SUICIdality DIfferentiation(SUICIDI-2) [6]) questionnaire was developed and updated over the recent years into version 2 with a 0, 1 and 2 score, see: https://suicidaliteit.nl/SUICIDI/SUICIDI%20translation.pdf

The differentiation model of suicidalitydifferentiates 4 subtypes of suicidality (figure 1) [4, 6]:

1*) perceptual disintegration (PD);* originated from the context of disturbed perceptions and/or behaviours,

2) primary depressive cognition (PDC); in the context of (a) depressive cognition(s),

3) psychosocial turmoil/"entrapment" (PT); in the context of acute reactivity to a (deemed or actual) loss, offence, adversity or doom,

4) inadequate communication/coping (IC) (Emphasizing Emotional Pain); in the context of communicating about intense suffering.

Figure 1 Hypothetical model for 4 suicidal subtypes.

<Figure 1 somewhere here>

Outreaching psychiatric emergency services often become involved in assessment of suicidality when it is recognized -or suspected- as a critical event by society, patient himself, significant other and/or healthcare professionals . Acute emergency services are required to set up policies around suicidality, appropriate treatment and safety planning [28]. In the Netherlands, the employees of these services are almost exclusively medical doctors or specialized consultant psychiatrists and (specialised) nurses. Psychologists are rarely present within these services [29].

An independent, consultant psychiatrist decides which policy to follow, based on the assessment of the crisis service, for example whether or not to move a person will be voluntarily or involuntarily to a psychiatric emergency facility [30]. Crisis services and acute admission wards are frequently confronted with serious suicidal behaviour and make a significant contribution to the prevention of suicide [31, 32].

These services though do not differentiate between different types of suicidality [28]. In a former position paper we described the study protocol [6].

Aim

In this first study we examine the feasibility and validity of a clinical differentiation model of suicidality[6]. We aim to answer the following questions:

1) Is the differentiation model workable for a selection of mental health care workers?

2) Can conclusions of patient records of suicidal high risk patients assessed by the outreach psychiatric emergency services, be rated in an absolute/discrete and gradual way?

3) Can clinicians allocate validly most/all cases to the proposed subtypes (PD, PDC, PT and IC)?

4) How are subtypes distributed?

5) Are these subtypes gradual delineated by using two different modes of gradual scoring (according SUICIDI questionnaire and an alternative 0-4 score per subtype), and is there consensus when different clinicians/investigators independently score them? What is de reliability of the different modes of scoring?

6) Which choice can be made in which form of gradual scoring? And is there any way to improve the SUICIDI-II questionnaire?

7) Can we perform a qualitative analysis after getting the results? When performing a qualitative analysis of scoring for the model can we provide feedback to the raters if there is any indication that incorrect scoring may have occurred?

2. Methods

Design

As described before [6], in this study expert mental health workers were asked to classify anonymised case descriptions of suicidal patients, to validate three methods of classifying four types of suicidality. Under supervision of RdW a detailed report of every assessment was jointly produced by a medical doctor and a mental health nurse, and the reports were supervised and discussed by consultant psychiatrist RdW. All assessments were discussed and evaluated in the morning hand-over by a team of at least 5 mental health workers from the outreaching psychiatric emergency service. Of every case an anonymized conclusion was prepared for the raters (see also table 2). A total of 503 cases were included in a database. Only patients who gave permission for the letter to be sent to the general practitioner were included. We collected the first 25 cases included between January 2018 - March 2018.

Participants

Patients were entered into the database after the first assessment. If a person was assessed for a second (or third) time during the period of data collection, the number of recurrence(s) was recorded as a variable (no duplication). Only patients who gave permission and informed consent for the discharge letters signed by RdW to be sent to the general practitioner and for the exchange of information bound by medical professional secrecy, were included for the anonymized database and conclusions.

The identity of all patients was protected by de-identifying and coding the cases. Gender, age, marital status, and cultural background of patients were recorded for every case. The DSM 5 classification (7) was used to establish the primary diagnosis. Referrers were noted and treatment policy was recorded. The following definition of suicidality was used: “behaviours including suicidal thoughts, suicide plans, suicide attempts and completed suicide”. The definition used for attempted suicide was: “Any non-fatal suicidal behaviour, such as intentional self-poisoning, self-injury or self-harm which may or may not have a fatal intent or outcome” [33] (p. 12).

Raters

The profession of the raters was matched as closely as possible with the professionals represented in the outreaching psychiatric emergency service. The characteristics of the raters are described in table 1. The raters (CM, AvdB, JE, NK, MG, MdG) were not selected at random but were found in the collegial and scientific network of RdW over four mental Health institutes, 3 in The Netherlands and 1 in England. There were 3 zoom sessions planned with RdW and the 6 raters (February, March and June 2021) in which the model was explained and instructions on details for correct scoring were given. Scoring forms and summarized details of cases needing to be scored for this study were sent on June the 30th 2021 and the deadline for submitting scores was September 1st 2021.

<Table 1 somewhere here>

Procedure

All raters received 25 anonymized conclusions (Table 3) and were asked to investigate the conclusions and to record the scores in a prepared Excel document which could be loaded onto SPSS. They were asked to make an absolute /discrete choice for a discrete subtype (PD, PDC, PT or IC) for each different case and even when in doubt, to still choose only one option.

In addition, the SUICIDI-2 questionnaire had to be scored as a dimensional value per subtype. In this questionnaire it is possible to score all subtypes with a zero, a 1 or a 2. Theoretically, multiple subtypes can be scored and there is no minimum or maximum and the total score per case can theoretically add up to totals between 1 and more than 5. see table 1:

https://suicidaliteit.nl/SUICIDI/SUICIDI%20translation.pdf

As an alternative way of gradual scoring, raters could score a total of 4 points for the “type agreement” (TA) for each case, and divide these 4 points between the 4 subtypes. In theory, it was possible to award

each subtype between 1-4 points, in the latter case leaving no remaining points to be scored for the other subtypes.

In September and October 2021 a ZOOM feedback meeting for the first study and follow-up was planned. In this meeting the findings were presented, a qualitative feedback was formulated and explanations for improvement and optimizing the SUICIDI-2 was given.

Ethical Considerations

All experimental protocols before starting the study were approved by the research committee of the Mental Health Institute Parnassia Group. The study adhered to relevant guidelines and regulations throughout the research process.

For this study, we utilized assessment letters addressed to the general practitioner (GP) and patient data that fell under the treatment responsibility of the primary author RdW. Data collection was contingent upon obtaining verbal consent from each patient, allowing for the sharing of assessment information with the GP and the exchange of medical data. If a patient declined permission, no information was used or collected for the study.
Explicit informed consent was not specifically obtained from the patients for this study. However, to ensure ethical considerations, we sought the review of the Medical Research Ethics Committee Leiden-The Hague-Delft. The committee assessed the permissibility of using and anonymizing the data in a manner that prevented the identification of individual cases.
The Medical Research Ethics Committee Leiden-The Hague-Delft, in accordance with the Involving Human Subjects Act (WMO), approved the study and waived the requirement for written informed consent (G21.021/PV/pv).

Analytic strategy

Intraclass correlation coefficient (ICC) estimates and 95% confidential intervals were calculated using SPSS statistical package version 27 (SPSS Inc. Chicago, IL) based on mean rating (K = 6). For absolute/discrete agreement we used a 2-way mixed-effects model according to the guideline for selecting and reporting ICC from Koo and Li [34]. The average measures from 6 raters are presented.

As described before ICC values less than 0.5, between 0.5 and 0.75, between 0.75 and 0.9, and greater than 0.90 are, respectively, indicative of poor, moderate, good, and excellent reliability [34].

3. Results

All raters were able to use the written conclusions as provided to score the subtypes in a dimensional and discrete manner, using the SUICIDI-2 model. Table 2 describes the absolute/discrete scores for the 25 cases for all raters. For 8 cases (32%) there was 100% consensus, for 21 cases (84%) there was more than 66.6 % consensus. As the absolute choice of one specific subtype, PD was chosen in 8.7% of the

cases by all raters, PDC was chosen in 33% of the cases by the raters, PT was chosen in 22.7% by the raters and finally IC was chosen in 35.3% of the cases by the raters.

<Table 2 somewhere here>

Table 3 gives examples of a selection of 4 conclusions of cases investigated by the raters with 100% consensus for each of the subtypes. For example: for case 20 every rater chose PD, for case 2, every rater chose PDC, for case 9 every rater PT and for case 23 every rater chose IC.

The only 4 cases (case 6, 8,11 and 12) with less than 66.7% consensus are presented as non-perfect cases in table 4.

<Table 3 and 4 somewhere here>

Table 5 gives the ICC for all the subtypes. Generally, reliability for every subtype was good (95% CI: between moderate –excellent). Regarding absolute scores: PT showed good reliability (95% CI: between moderate –excellent) on average . Absolute PDC showed an average of excellent reliability (95% CI: between good-excellent). Absolute PT showed an average reliability (95% CI: between moderate-excellent) and finally absolute IC showed good reliability (95% CI: between moderate –excellent) on average.

For the dimensional scores 0-4 (TA); PT showed an average of good reliability (95% CI: between moderate –excellent). PDC showed an average of excellent reliability (95% CI: between good-excellent). PT showed an average of good reliability (95% CI: between good-excellent). Finally IC showed an average of good reliability (95% CI: between moderate –excellent). The reliability of the SUICIDI-2 score was relatively lower but gave only a lower reliability for IC (95% CI: between moderate –good). In general the ICC scores for the SUICIDI-2 questionnaire were lower than for the (TA) 0-4 score.

<Table 5 somewhere here>

Table 6 describes the primary diagnosis. Depressive disorder and substance use was most common among the suicidal patients.

<Table 6 somewhere here>

Table 7 describes some characteristics of the suicidal patients.

<Table 7 somewhere here>

During the course of the evaluation, it was noticed one of the raters had scored PD relatively often. The underlying reason for the scoring was explained by the rater when results were evaluated and discussed. According this rater alcohol and substance abuse distort perception and assessment of the situation a person finds himself in and may affect the suicidal process/ suicidality. This was discussed with the raters during a follow-up session. Nevertheless, the underlying etiological basis of suicidality always prevails. It is important to look at the most common undifferentiated etiological basis causing a

deregulation of the process, leading to a suicidal crisis or suicidality in general. It is explained in the model that the underlying etiological basis of the suicidality should always be found.

There was some discussion about IC, which according to two of the raters was a semantic discussion about communication and the underlying process. It was explained that in case of affective disregulation, PDC should be scored more frequently.

4. Discussion

The current study found the subtypes of the differentiation model of suicidality to be supported by ICC reliability research.

Development of the concept of " subtypes of suicidality" was clinically motivated, in order to get a better grip on a more rationalised diagnostic formulation of suicidality (36). Many professionals already distinguish between subtypes of suicidality, but there is a lack of literature of validated differentiation of suicidality (10).

As far as we know, this is the first attempt to improve the subdivision/subdifferentiation of (entrapment of) suicidality using heterogenous clinical information as a starting point, and to validate the findings.

Because of the current and most up to date results, and better results with a scoring system of 0–4 rather than 0–2, combined with a better TA, the SUICIDI-2 questionnaire was re-written to fit with a 0–4 scoring system and 0–2 scoring was abolished, also for future research. Rewriting criteria for the SUICIDI-2 questionnaire are, by virtue of these results, combined with the better TA score and will reformulated in a 0–4 score. The 0–2 score will be no longer used in future research. A revised SUICIDI-3 questionnaire (version 3.1) is yet made and can be found on https:suicidaliteit.nl.

https://www.suicidaliteit.nl/2022/SUICIDIenglish3.1/EnglishSUICIDI-3.2.pdf

Clinical and research implications

This study contributes to the development of improved insight in suicidality and more specific tools to set up a treatment plan for the complexities of suicidal ideation and suicidal behaviour. Differentiating different types of suicidality is important for efficient information sharing when patients are transferred between practitioners; it is a tool to better inform family and carers and will allow a more precise indication for systemic interventions.

However, subtypes are not dichotomies and there is significant overlap between subtypes, making it unclear how the overlap is distributed [4]. It may well be possible for certain subtypes to be composed of several mixtures. Perhaps subtypes themselves may allow further subdivision. Future research with larger numbers will look into the overlap between subtypes and investigate if there is room for further subdivisions, or whether there is a need for additional subtypes. It is also important to investigate which clinical and demographic features are associated with certain subdivisions, and to assess if the subtypes

are consistent over time, or whether they change. Furthermore, By doing the research, we realized the importance of clearly explaining the role of the underlying aetiology or “entrapment” of the suicidal process to the assessors. This importance is evident infor example the case of a person with large gambling debts leading to unemployment, and their partner not being aware of it. Should this person get drunk, the underlying stress will exacerbate the suicidal process and -because of the intoxication- may be perceived by a rater as perceptual disintegration.However, in this case psychosocial turmoil (PT), luxated by alcohol abuse is the actual underlying trigger [35] and we are aware of the risk of scoring becoming inconsistent if the system is not properly explained.

This does not take away the fact that certain substances may be primarily responsible for the suicidal process. Despite this, there is no clear/ unambiguous evidence for psychedelics to be linked to suicidal behaviour. As clinicians we see substance abuse being primarily responsible for suicidal behaviour at an individual level, however we cannot draw conclusions about the group in general[36]. This is something to be investigated through future research.

Inadequate coping may lead to “white noise”. We believe that IC needs to be considered a serious form of suicidality and the practitioner has to take a deep and hard look at underlying motivation of the suicidal process and suffering, being aware of counter transference playing a role in the assessment. Inadequate coping should never be a reason to justify “doing nothing” (withholding care). It may indicate we have reached the last boundaries of care we can deliver and it would be better for practitioners to translate their perceived impotence into a more targeted search for alternatives, in joint cooperation with other parties.

We also need to take into consideration that some people may not be suicidal, yet pretend to be so in order to use the threat of suicide as blackmail, when they are not actually not suffering with underlying suicidality [37], and to distinguish this from “blackmail” as inadequate suicidal coping mechanism [38]. Perhaps this group overlaps -unjustified- with IC? Maybe we need to find criteria to -even when it is communicated as such- refrain from labelling some behaviour as suicidal. In any doubt it should always be taken seriously and be very careful to use the term blackmail with suicidality.

The study hopefully contributes to the fine-tuning of biological-psychiatric research into suicidality, by way of improving differentiation of groups, which could mean a manifestation of different types of biological disregulation or underlying biological/genetic vulnerabilities [39].

Subtypes may allow better clinical descriptions of a phenotype [40]. The same can be said for underlying vulnerabilities within the range of dimensions of personality ([41]. Which form of treatment has the best results (Collaborative Assessment and Management of Suicidality, Dialectical Behavior Therapy, Cognitive Behavioral Therapy, etc) should also be investigated [4, 42, 43].

Limitations

Several limitations of this study have to be considered as well. Seriously suicidal patients requiring assessment by emergency services were included and subdivided in subgroups. We are aware this group differs from patients being referred to -or presenting to- outpatient/ community services; this group also differs from the group of patients being admitted to a mental health ward. Some forms of suicidality stand out more, and require a more rapid response from the services. We also need to consider the fact that the majority of suicides happens without intervention of mental health services. Research into these groups seems more difficult, however it may be possible to do in follow-up studies. It might be useful if the model is used for psychological autopsies of people who did not access specialised care and look at whether there is a difference between subdivisions/differentiation of suicides within services and suicides outside mental health services.

We are aware the sample size is small, however, there are a number of plans for follow-up research.

It is important for psychologists and other mental health workers -other than psychiatrists and nurses- to gain experience with the model and contribute to validation studies of the model. A multi-disciplinary team (psychologists, GP's, and other related disciplines) ideally needs to be included in future research .

Because the conclusions and summaries of the patients were written by a nurse and a junior doctor and supervised by a psychiatrist (RdW), it is possible that the subjective clinical opinion of the clinicians was expressed in the conclusion.

5. Conclusions

With this first study and the start of this research project, we hope to contribute to the development of better tools, allowing more grip on understanding different forms of suicidality and consequently we hope to develop a better tailored policy and treatment of suicidality. Ultimately, by making a distinction between different types of suicidality, we hope to contribute to a reduction in the number of suicides. The results of this study are encouraging enough for a follow-up study with more cases and an extended study is planned [6].

Declarations

Ethics approval and consent to participate

All experimental protocols before starting the study were approved by the research committee of the Mental Health Institute Parnassia Group. The study adhered to relevant guidelines and regulations throughout the research process.

For this study, we utilized assessment letters addressed to the general practitioner (GP) and patient data that fell under the treatment responsibility of the primary author RdW. Data collection was contingent upon obtaining verbal consent from each patient, allowing for the sharing of assessment information with the GP and the exchange of medical data. If a patient declined permission, no information was used

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Consent for publication

Not applicable.

Availability of data and materials

The datasets used and analysed during the current study is available from the corresponding author on reasonable request..

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Competing interests

None. The authors declare that they have no competing interests.

Author Contributions

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All authors made substantial contributions in drafting and critically revising the content of the paper. RdW, MdG, DdB, CM, MH contributed in conceptualizing and designing the study, and in data acquisition, analysis and interpretation. CN and DS contributed as experience expert or peer supporter and in conceptualizing, in the study. GvS contributed in the data interpretation. CM, AvdB, JE, NK and MG contributed as evaluators and as rater in the study. All authors approved the manuscript as submitted and agreed to be accountable for all aspects of the work.

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References

1. Borges G, Nock MK, Haro Abad JM, Hwang I, Sampson NA, Alonso J, Andrade LH, Angermeyer MC, Beautrais A, Bromet E, et al. Twelve-month prevalence of and risk factors for suicide attempts in the World Health Organization World Mental Health Surveys. J Clin Psychiatry. 2010;71(12):1617–28.
2. Platt S, Arensman E, Rezaeian M. National Suicide Prevention Strategies - Progress and Challenges. Crisis. 2019;40(2):75–82.
3. Blasco-Fontecilla H, Rodrigo-Yanguas M, Giner L, Lobato-Rodriguez MJ, de Leon J. Patterns of Comorbidity of Suicide Attempters: An Update. Curr psychiatry Rep. 2016;18(10):93.
4. de Winter RFP, Meijer C, Kool N, de Groot MH. Differentiation of Suicidal Behavior in Clinical Practice. In: *Suicide Risk Assessment and Prevention.* edn. Edited by Pompili M. Cham: Springer International Publishing; 2021: 1–19.
5. Allan NP, Gros DF, Lancaster CL, Saulnier KG, Stecker T. Heterogeneity in Short-Term Suicidal Ideation Trajectories: Predictors of and Projections to Suicidal Behavior. Suicide Life-Threat Behav. 2019;49(3):826–37.
6. de Winter RFP, Meijer CM, Enterman J, Kool-Goudzwaard N, van Gemen M, van den Bos AT, Steentjes D, van Son GE, Hazewinkel MC, de Beurs DP et al. Validation and Usability Strategy for a Clinical Model for Differentiation of Suicidality: Methods and Study Protocol. JMIR accepted 2023, 45438.
7. Fehling KB, Selby EA. Suicide in DSM-5: Current Evidence for the Proposed Suicide Behavior Disorder and Other Possible Improvements. Front Psychiatry. 2020;11:499980.
8. Association AP. Diagnostic and statistical manual of mental disorders: DSM-5. *Arlington, VA* 2013.
9. Brown LA, Bryan CJ, Butner JE, Tabares JV, Young-McCaughan S, Hale WJ, Fina BA, Foa EB, Resick PA, Taylor DJ, et al. Identifying suicidal subtypes and dynamic indicators of increasing and decreasing suicide risk in active duty military personnel: Study protocol. Contemp Clin trials Commun. 2021;21:100752.
10. Spuijbroek AT, Leezer YM, de Beurs DP, de Winter RF. [The proportion of suicides committed by patients with a mental health disorder for which treatment costs are now no longer reimbursed by health insurance]. Tijdschrift voor psychiatrie. 2016;58(11):803–8.
11. Martin J, LaCroix JM, Novak LA, Ghahramanlou-Holloway M. Typologies of Suicide: A Critical Literature Review. Archives of suicide research: official journal of the International Academy for Suicide Research. 2020;24(sup1):25–40.
12. Colpe LJ, Pringle BA. Data for building a national suicide prevention strategy: what we have and what we need. Am J Prev Med. 2014;47(3 Suppl 2):130–6.
13. Mokkenstorm J, Franx G, Gilissen R, Kerkhof A, Smit JH. Suicide Prevention Guideline Implementation in Specialist Mental Healthcare Institutions in The Netherlands. Int J Environ Res

Public Health 2018, 15(5).

14. Klonsky ED, Qiu T, Saffer BY. Recent advances in differentiating suicide attempters from suicide ideators. Curr Opin Psychiatry. 2017;30(1):15–20.
15. Diagnosis and classification of diabetes mellitus. Diabetes Care. 2005;28(Suppl 1):37–42.
16. Sotiriou C, Neo SY, McShane LM, Korn EL, Long PM, Jazaeri A, Martiat P, Fox SB, Harris AL, Liu ET. Breast cancer classification and prognosis based on gene expression profiles from a population-based study. Proc Natl Acad Sci USA. 2003;100(18):10393–8.
17. Joosten-Weyn Banningh L, Vernooij-Dassen M, Rikkert MO, Teunisse JP. Mild cognitive impairment: coping with an uncertain label. Int J Geriatr Psychiatry. 2008;23(2):148–54.
18. Burgers K, Lindberg B, Bevis ZJ. Chronic Diarrhea in Adults: Evaluation and Differential Diagnosis. Am Family Phys. 2020;101(8):472–80.
19. Dawson DF. Relationship management and the borderline patient. Can family physician Medecin de famille canadien. 1993;39:833–9.
20. Jobes DA, Gregorian MJ, Colborn VA. A stepped care approach to clinical suicide prevention. Psychol Serv. 2018;15(3):243–50.
21. de Groot MH, de Winter RF. De beoordeling van het suïciderisico. In: *Handboek suïcidaal gedrag.* edn. Edited by van Heeringen C PG, de Beurs D, Kerkhof A. Utrecht: de Tijdstroom 2019.
22. Stanley IH, Simpson S, Wortzel HS, Joiner TE. Documenting suicide risk assessments and proportionate clinical actions to improve patient safety and mitigate legal risk. Behav Sci Law. 2019;37(3):304–12.
23. Goldney D. Suicide Prevention: a practical approach. Oxford: Oxford University Press; 2008.
24. Williams J, Barnhoferj T, Duggan D. Psychology and suicidal behavior: elaborating the entrapment model. In: *revention and treatment of suicidal behavior From science to practice.* edn. Edited by Hawton K. Oxford: Oxford University Press; 2005.
25. Van Hemert A, Kerkhof A, de Keijser J, Verwey B, van Boven C, Hummelen J, de Groot M, Lucassen P, Meerdinkveldboom J, Steendam M, et al. Multidisciplinaire richtlijn voor diagnostiek en behandeling van suïcidaal gedrag. De Tijdstroom; 2012.
26. de Winter RFP. Towards an improvement of the differentiation of depressive disorders. A multidimensional approach. Leiden: Leiden University; 2009.
27. de Beurs D, de Winter R, Helbich M, Bockting C. Suicidal Behavior from a Complex System Perspective: Individual, Dynamical, and Contextual. In: *Suicide Risk Assessment and Prevention.* edn. Edited by Pompili M. Cham: Springer International Publishing; 2021: 1–13.
28. de Winter RF, de Groot MH, van Dassen M, Deen ML, de Beurs DP. [Suicidal behaviour and attempted suicide occurring during assessment by the outreach psychiatric emergency service]. Tijdschrift voor psychiatrie. 2017;59(3):140–9.
29. Novotney A. Guarding mental health in the emergency room. i>http://wwwapaorg/monitor/2018/06/mental-health-emergency 2018, 49(6).

30. de Winter RFP, Hazewinkel MC, van de Sande R, de Beurs DP, de Groot MH. Outreach Psychiatric Emergency Service Crisis. 2020;41(5):375–82.
31. Glick RL, Berlin JS, Fishkind A. Emergency psychiatry: Principles and practice. Lippincott Williams & Wilkins; 2008.
32. While D, Bickley H, Roscoe A, Windfuhr K, Rahman S, Shaw J, Appleby L, Kapur N. Implementation of mental health service recommendations in England and Wales and suicide rates, 1997–2006: a cross-sectional and before-and-after observational study. Lancet (London England). 2012;379(9820):1005–12.
33. Organization WH. Preventing suicide: A global imperative. World Health Organization; 2014.
34. Koo TK, Li MY. A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. J Chiropr Med. 2016;15(2):155–63.
35. Simoneau H, Ménard JM, Blanchette-Martin N. Addiction Severity and Suicidal Behaviors Among Persons Entering Treatment. Archives of suicide research: official journal of the International Academy for Suicide Research. 2017;21(2):341–53.
36. Johansen P, Krebs TS. Psychedelics not linked to mental health problems or suicidal behavior: a population study. J Psychopharmacol (Oxford England). 2015;29(3):270–9.
37. Abbas MJ, Mohanna MA, Diab TA, Chikoore M, Wang M. Why Suicide? The Analysis of Motives for Self-Harm. Behav Cogn Psychother. 2018;46(2):209–25.
38. Jobes DA. Suicidal blackmail: Ethical and risk management issues in contemporary clinical care. In: *Casebook on ethically challenging work settings in mental health and the behavioral sciences* edn. Edited by Johnson WBK, G. P. New York Oxford University Press; 2011.
39. Lengvenyte A, Conejero I, Courtet P, Olié E. Biological bases of suicidal behaviours: A narrative review. Eur J Neurosci. 2021;53(1):330–51.
40. DiBlasi E, Kang J, Docherty AR. Genetic contributions to suicidal thoughts and behaviors. Psychol Med. 2021;51(13):2148–55.
41. Rujescu D, Giegling I. Frontiers in Neuroscience. Intermediate Phenotypes in Suicidal Behavior Focus on Personality. In: *The Neurobiological Basis of Suicide.* edn. Edited by Dwivedi Y. Boca Raton (FL): Taylor & Francis Group, LLC.; 2012.
42. Kessler RC, Chalker SA, Luedtke AR, Sadikova E, Jobes DA. A Preliminary Precision Treatment Rule for Remission of Suicide Ideation. Suicide Life-Threat Behav. 2020;50(2):558–72.
43. Sobanski T, Josfeld S, Peikert G, Wagner G. Psychotherapeutic interventions for the prevention of suicide re-attempts: a systematic review. Psychol Med 2021:1–16.

Tables

Table 1 Characteristics of raters and scoring procedure

Rater	*profession*	*Experience (years)*	*Practising in mental health*	*Institute*
1	Nurse scientist Ph.D.	40	V	Lentis
2	Nurse scientist Ph.D.	35	X	Parnassia
3	Nurse BSc	45	V	Rivierduinen
4	Psychiatrist MD	38	V	Parnassia
5	Psychiatrist MD	36	V	NHS
6	Psychiatrist MD	20	V	Rivierduinen

all	Scoring	***Absolute/discrete score***	***Gradual SUICIDI***	***Gradual 0-4 score***
	Subtype			
	PD	Yes/no	0-2	0-4
	PDC	Yes/no	0-2	0-4
	PT	Yes/no	0-2	0-4
	IC	Yes/no	0-2	0-4
	Scoring	**Only one time yes**	**Score per subtype**	**Always 4 points**

Table 2: All absolute scores for all 6 raters.

Case	Perceptual	Depression	Turmoil	Coping		
1	1		4	1		6
2		**6**				**6**
3		1		5		6
4		5	1			6
5		**6**				**6**
6		2	1	3		6
7	1	1		4		6
8	1	1	2	2		6
9			**6**			**6**
10		5		1		6
11	1	1	1	3		6
12	2	2	2			6
13		**6**				**6**
14			2	4		6
15			4	2		6
16		**6**				**6**
17				**6**		**6**
18			2	4		6
19			5	1		6
20	**6**					**6**
21			4	2		6
22	1	1		4		6
23				**6**		**6**
24		2		4		6
25		5		1		6
Total	13 (8.7%)	50 (33%)	34 (22.7%)	53 (35.3%)		150

Table 3 perfect cases: gives examples of a selection of 4 of the 8 perfect cases. Between brackets the choice for the perfect cases: I=PD, II-PDC, III=PT and IV=IC)

Casus 20 (PD) (Home) assessment of suicide risk concerning a 20-24 year old, Muslim woman living with her parents. She presented for assessment after she threatened to cut herself, holding a knife. Mother stopped her from doing so and the police were called. Patient completed higher level education recently and had been working in the library for a week while at the same time a beloved uncle had died.

Patient seemed to have functioned normally up to a few days prior to presentation and had since become anxious and paranoid. There is no history of substance abuse and she refused to comply with somatic investigations with her GP. We saw a woman who was lying in bed underneath the covers in a darkened room, during the day, and hardly answered (open) questions. It was not clear if she would not or did not want to answer the questions. According to the information of the family, the presentation is suspect of a first psychotic episode with paranoia whilst it is not clear what the context would be. Additionally, we saw symptoms of catatonia with mutism, negativism, staring and evidence of reduced food & fluid intake. Patient was admitted involuntarily.

Casus 2) (PDC) Suicide risk assessment of a 45–49-year-old, married mother with 3 children who presented to her GP because she was concerned about not being able to resist longstanding suicidal ideation. Suicidal thoughts had been present for approximately 3 weeks and she was not aware of any triggers. In the past she was seen once by the community team for a moderate depression but refused treatment. We saw a restless, anxious woman who could not make a reliable safety plan. As a differential diagnosis we considered an anxiety disorder (GAD with symptoms of depression) or a depressive illness with secondary anxiety. Patient had not informed anyone close to her about her symptoms and initially did not want her husband to be called. In the end she agreed for him to be informed and after the arrival of her partner she had calmed down already and a reliable safety plan could be agreed. She agreed to be followed up by the community team (acute care) and admission was avoided.

Casus 9 (PT) Assessment of suicide risk of a 15–19-year-old, well kempt woman without a psychiatric history who presented trough the police, after she -under the influence of alcohol- jumped in front of a car after leaving a friend's party, resulting in her being hit though not wounded. We saw a calm, friendly girl, denying suicidality, and feeling sorry and embarrassed about what happened. Sexually explicit recordings of her with several men had been distributed. Behaviour was explained by the effects of alcohol and being informed about the recordings and consequent shock. Patient is able to agree to a safety plan and has plans for the future. There are no symptoms of any underlying depression, there is no history of suicide attempts or self-harm. She goes home with her mother. Suicide risk does not appear to be acutely increased. It was decided to refer patient to suicidality aftercare care project (SUNA).

Casus 23 (IC) Suicide assessment of a 60-64 year old male, with a previous diagnosis of schizophrenia and gambling addiction, being under the care of the community mental health team. On the day of assessment, he had been discharged from the supported living accommodation. The decision to discharge him had been agreed by the higher management and could not be reversed. Patient had not complied with agreements, and for some time already there had been problems with aggression and being a nuisance to his environment. There had been a number of warnings and meetings with the patient about his behaviour. Patient went to "sheltered housing" but did not want to share a room with others and went on to express suicidal ideas. When seen there was no evidence of psychosis, nor was there evidence of burnt-out schizophrenia affecting his behaviour. There is no history of suicide attempts, and suicidal behaviour seems to be a lever to get what he wants, this idea being supported by the information from staff of supported accommodation and his therapist. There is no indication for admission.

Table 4 non-perfect cases. Description of the the 4 (non-perfect) cases with less than 66.6% consensus. Between brackets the choice for the non-perfect cases (case 6 and 11 IC most common , for case 8 and 12 no choice could be made by equal weight)

Casus 6 (≤0.5) (IC) Assessment of a 40-44 year old Dutch woman with a diagnosis of PTSD, dependence on cocaine, borderline personality disorder, a history of prostitution and suicide attempts. Patient lives in sheltered accommodation and is followed up by the community mental health team. She presented at the A&E department after an overdose of 20 tablets of oxazepam 50 mg and cocaine (worth 390 euros). We assessed a desperate woman who states to be tired of life and wanting to end her horrible existence. There seems to be no end to her misery and she does not know how to proceed. She indicates she will do another suicide attempt with oxazepam if we let her go because everything is useless. She regrets the failed attempt. Ultimately, she agrees to a voluntary admission to a crisis unit to avert suicide.

Casus 8 (≤0.5) (?) Assessment of a 50-54 male, known to be alcohol dependent. Presentation is triggered by an argument with his wife and son, and he made suicidal statements under the influence of alcohol. The police were informed by the neighbours. We assessed a reasonably kempt man who states that his problems stem from financial and relationship problems. During assessment alcohol abuse seems to be paramount and it makes him impulsive, and there is no evidence of current suicidal ideation or plans. He feels his support system and people close to him do not understand him, though is feeling better now. Acute suicide risk is considered not to be increased anymore. Patient says not to want help anymore and wants to be discharged so he can work his shift in a restaurant.

Casus 11 (≤0.5) (IC) Assessment of suicide risk of a 30–35-year-old woman with previous diagnosis of PTSD and a dissociative disorder, known to different community teams though treatment seems to stagnate after a short period because of non-attendance to appointments. Patient was referred because of a suicide attempt by ingesting 30 tablets of peppermint oil and 30-40 tablets of diazepam 5 mg, after which she called her father to say goodbye; following this an ambulance was called. During the assessment patient states she is desperate because she has been suffering for 14 years with abdominal pain of unknown origin. Her abdominal pain dominates her life, and somatic delusions cannot be excluded. She makes a tired impression and appears desperate. Initially she says she will try to kill herself again but during the course of the assessment and involvement of her family, a safe situation is created. She also has plans for the coming week. Suicide risk is assessed as not acutely increased, and an urgent referral to the mental health community team is arranged.

Casus 12 (≤0.5) (?) Assessment of suicide risk at the A&E department of a 45-49 year old man with no previous psychiatric history. He apparently referred himself to a different mental health trust and had a first meeting with them already. Patient was found by his girlfriend at home after a suicide attempt by ingesting medication (25-29 tablets containing a benzodiazepine) and pulling a plastic bag over his head, after writing farewell letters. He was transported by ambulance to A&E. There have been several experiences of loss, and his daughter attempted suicide by jumping out of the window of the family home, later stating she did not regret the attempt. Patient appears to be suffering from a low mood and is preoccupied with his financial situation (differential diagnosis is delusion of poverty). Patient believes nothing will ever be right again and he is the culprit of all misery. He perceives himself to be rotten to the core hence his daughter not being able to do anything but die. He is persistent in his wish to die and a diagnosis of severe depression with psychotic symptoms is considered. Despite an involuntary admission being regarded, he agrees to a voluntary admission. Suicide risk is assessed as acutely increased.

Table 5 Intraclass correlation absolute agreement coefficient Values less than 0.5 are indicative as poor reliability, moderate reliability scores between 0.5 and 0.75, good reliability for scores between 0.75 and 0.9, and excellent reliability for scores greater than 0.90.

Average measure	*ICC*	*95% CI lower bound*	*95% CI upper bound*	*Value*	*Cronbach Alpha*
All types	,854	,743	,927	7,795	,872
Absolute Perceptual (PD)	.836	..713	.918	6.930	.844
Absolute Depressive (PDC)	.913	.848	.957	11.861	.916
Absolute Turmoil (PT)	.821	.683	.911	5.436	.816
Absolute Communication (IC)	.820	.586	.910	6.000	.823
Perceptual (PD) TA	,834	,710	,917	6,478	,846
Depressive (PDC) TA	,932	,880	,966	14,70	,932
Turmoil (PT) TA	,892	,809	,946	9,992	,932
Communication (IC) TA	,823	,690	,912	6,327	,842
Perceptual (PD) SUICIDI	,802	,654	,901	5,535	,819
Depressive (PDC) SUICIDI	,871	,774	,936	8,447	,882
Turmoil (PT) SUICIDI	,851	,740	,926	7,328	,864
Communication (IC) SUICIDI	,790	,634	,895	5,150	,806

Table 6 major primary diagnosis in all suicidal patients

Major diagnosis	n (percentage)
Depressive disorder	6 (24%)
Alcohol/substance abuse	6 (24%)
PTSD	4 (16%)
Psychotic disorder	2 (8%)
Bipolar disorder	2 (8%)
ADHD	2 (8%)
Borderline disorder	1 (4%)
ASS	1 (4%)
Eating disorder	1 (4%)
Total	*25 (100%)*

Table 7 description of selected characteristics of the suicidal patients

Topic	N (percentage) or mean (SD)
Actual in treatment	**10 (40%)**
Policy: IHT or admission	**10 (44%)**
Involuntary admission	**2 (8%)**
Female	**15 (60%)**
Out of office time	**11 (44%)**
Attempt	**16 (64%)**
Dutch ethnicity	**16 (64%)**
Age	**38.6 (14.6)**

Figures

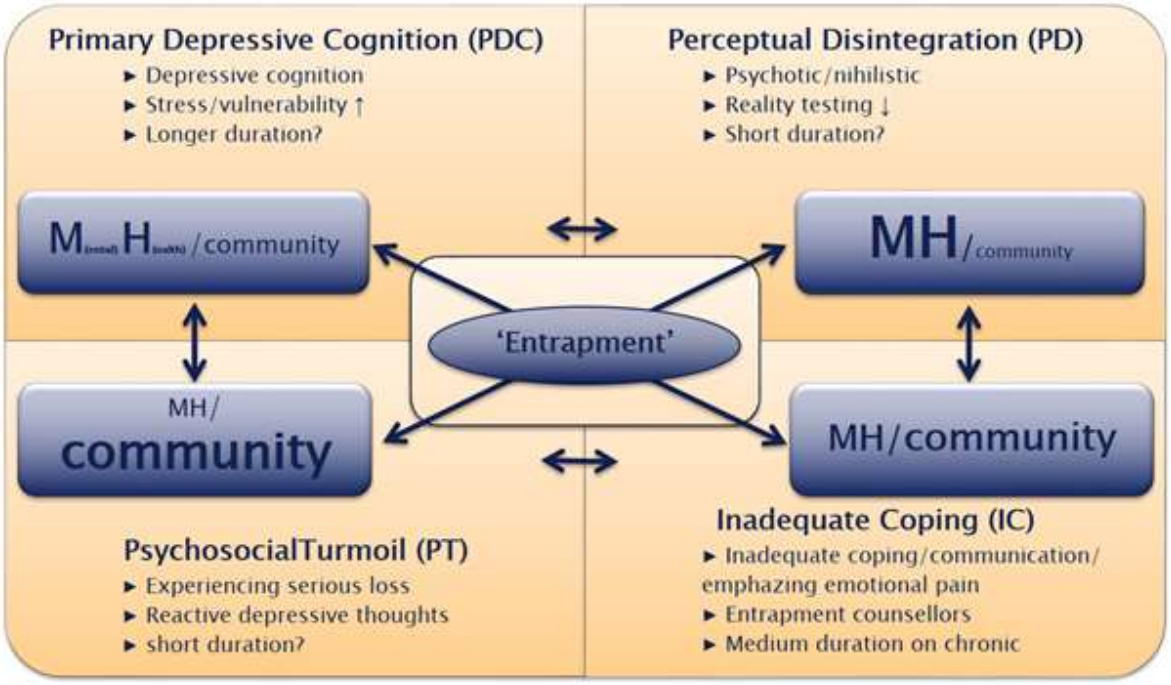

Figure 1

Hypothetical model for 4 suicidal subtypes. Degree of responsibility for (mental) health (MH) care or patient with society (community) [6]