Predicting discharge from long-term forensic treatment: a study of patient characteristics, protective factors, needs, and treatment-related factors in Czechia

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Abstract

One of the challenges in forensic psychiatry is determining when an inpatient is ready to be discharged and return to the community. The comprehension of factors that predict extended treatment or discharge is relatively limited. We assessed the treatment progress of a cohort of forensic inpatients divided into two groups: discharged patients and patients who remain detained. We derived socio-demographic and clinical variables from each patient's medical records and scores on the HoNOS-Secure, GAF, and SAPROF scales. The dataset was subjected to logistic regression and Chi-square analysis to determine the relevant factors. We gained insights into illness as a strong predictor of discharge, which is also associated with the patient's general compliance with the facility program and participation in occupational therapy. The majority of our sample has moderate or severe functional impairment according to GAF. The instruments used can capture dynamic factors related to discharge or continuing hospitalization, namely the SAPROF total or external factors score, the HoNOS-Secure subscale, and significant items from the HCR-20 clinical and risk subscales.

Keywords: long-stay forensic patient, prolonged detention, SAPROF, HoNOS-Secure, GAF

Introduction

Many European countries are experiencing growth in the numbers of forensic inpatients as well as increased average lengths of stay (LoS) (Chow, 2016; Tomlin, 2021). The responsible factors are incompletely understood. While long-term treatment minimises the risk to society, it can result in the complete isolation of forensic inpatients from society and a deterioration in their functional capacity analogical to other types of prolonged psychiatric hospitalization (Bellus, 2000). Furthermore, if the patient is treated inappropriately or for longer than necessary, the restrictive nature of the forensic environment can potentially result in human rights violations (Hettema, 2019). There is evidence that an inadequate level of security is applied to a large proportion of patients in some service systems (Flynn, 2011; Hare Duke, 2018; Harty, 2004). Furthermore, long-term hospitalization raises resource issues (Gibbons, 2015), and a shortening is welcomed in every system as long as the danger to the public is sufficiently reduced (van Lier, 2018).

Multiple studies have explored the socio-demographic and treatment-related characteristics associated with LoS with the aim of identifying the factors that make more prolonged treatment necessary (Andreasson, 2014; Eckert, 2017; Ross, 2012; Shah, 2011; Völlm, 2018). Even if carried out under different legal systems or service provision conditions, they generally conclude that the socio-demographic predictors of LoS are: being male, an early manifestation of offending behaviour, and the committing of multiple offenses or an index offense (Huband, 2018; Völlm, 2018). In some studies, the seriousness of the offending behaviour is correlated with LoS (Davoren, 2013; Sedgwick, 2016), however this has not been consistently replicated (Huband, 2018; Shah, 2011). The clinical parameters associated with LoS are: diagnosis of schizophrenia, resistance to treatment or symptom persistence, cognitive impairment, the committing of a crime as a result of hallucinations or during drug treatment discontinuation, and the committing of crimes over an extended period of time

(Gosek, 2020; Huband, 2018; Sedgwick, 2016). When treatment is under way, a history of absconding, slow progress, complex mental health problems, and severe assaults on staff predict longer stays (Eckert, 2017; Völlm, 2018).

Treatment for the forensic population prioritises criminogenic needs. However, measuring treatment progress is equally necessary for decisions on terminating inpatient treatment (Davoren, 2013; Kennedy, 2019). Changes in the HCR-20 clinical or risk scales predicted shifts in security levels (Müller-Isberner, 2005) and discharge into the community (Penney, 2016). Higher HCR-20 histories and risk-item subscale scores predicted longer stays (Eckert, 2017; Webster, 2013). However, it is argued that risk assessment tools alone have limited sensitivity to change (Kennedy, 2019). Using SAPROF improves the predictive value of HCR-20 for future violence by combining risk and protective factors, and this combination shows incremental predictive validity for institutional misconduct over HCR-20 (de Vogel, 2011, 2014; Oziel, 2020).

Another approach to treatment progress and outcome evaluation is mapping patients' general needs, which can serve as an outcome measure in forensic treatment (Kennedy, 2019; Vos, 2016). If a need is defined in terms of a difficulty or impairment that requires intervention (Grosser, 1994), then the extent to which those needs are fulfilled reflects the success of the treatment itself.

Czech psychiatric services are undergoing a transformation and a shift from institutionally-based to recovery-oriented care. These changes are significantly affecting forensic services (Páv, 2020b). Implementing recovery principles in the forensic field is one of the most challenging tasks within the service transformation process (Páv, 2017; Walravens, 2019). Nonetheless, strengths-based approaches to offender rehabilitation such as the "Good lives model" are increasingly vital (Ward, 2002). To facilitate the transformation

process within the forensic psychiatry field, we have translated the HCR-20^{V3}, SAPROF, and SVR-20 V2 structured professional assessment tools (Halouzková, 2020; Páv, 2020a; Páv, 2020b; Vňuková, 2020). The measurement of treatment intervention effectiveness and the use of outcome measures have also been introduced (Broulíková, 2019; Gibbons, 2015; Winkler, 2018). For this reason, systematic needs mapping and quality-of-life assessment are routinely used in Czechia (Kalisova, 2018; Páv, 2017). Nonetheless, there is still limited evidence on how risk or protective factors relate to the general needs of the forensic inpatient population, and how needs fulfilment affects the patients' readiness for discharge.

Aims and hypotheses

This study aimed to identify critical factors that differentiate between prolonged forensic hospitalization and discharge into the community. The second aim was to pilot the use of structured assessment tools and assess their ability to measure dynamic factors, the risk of violence, protective factors, and general and safety needs in inpatient treatment to produce data concerning relevant outcome measures in forensic care. The third aim was to obtain the first descriptive analysis of the characteristics of the long-term inpatient forensic population in Czechia.

Methods

Study setting and design

The study was conducted at Bohnice Psychiatric Hospital, Prague. The Bohnice hospital provides protective treatment (PT) in a catchment area with a population of 1 200 000 (the population of Czechia was 10 699 142 (data from the Czech Statistical Office as of July 30th 2020). The hospital provides forensic care in three wards (36 medium-security beds, 35 low-security beds, and 18 beds in a low-security unit with a sexology treatment program).

Decisions on transfers between wards with different security levels are the responsibility of the therapeutic team and require no court approval.

We compared two cohorts. The first included only PT male inpatients hospitalized for longer than two years (n = 40); the second included only discharged PT males with hospitalization also exceeding two years (n = 42) and discharged between January 1st 2015 and March 31st 2020. We are aware that there is no consensual definition of 'long-stay'. Some studies use five years as the definition of 'long-stay' in a medium-security setting (Völlm, 2018), while two years is typical at our level of security (medium or low) (Huband, 2018). Another reason for using the two-year interval is that this is the maximum inpatient treatment placement period determined by Czech law. We excluded three patients who died and five who were transferred to a different forensic facility. We assessed protective factors and patients' needs, and collected a set of socio-demographic and treatment-related characteristics for both cohorts. The Bohnice Psychiatric Hospital Ethics Committee fully approved the study.

Data collection took place between April 1st and July 30th, 2020. We used all the available information sources, including hospital records, expert opinions in medical records, and other healthcare services documentation. All the assessments were performed only by trained evaluators. We obtained specific data from large-scale evaluations conducted as part of the reform of Czech psychiatric care (all SMI patients hospitalized for longer than six months have regular HoNOS and GAF screening).

Instruments and measures

Sociodemographic, crime, and treatment-related data

We created a list of variables, including personal information, clinical assessment data, forensic history, insights, and legal and crime-related data. In creating the set, we were

inspired by reports (Ross, 2012; Völlm, 2018, 2017). We used HCR-20^{v3} item definitions for scoring insights, ward regime, and participation in therapeutic activities (Douglas, 2013) translated into Czech (Vňuková, 2020).

We assessed patients' needs using the HoNOS-Secure scale – a forensic version of the Health of the Nation Outcome Scale (Sugarman, 2009). This scale allows the tracking of clinical progress within a secure setting against a range of mental health needs (Shinkfield, 2016). The rating is based on the current need for a safe care environment, taking into account past behaviour, attitudes, treatment progress, and prospects (Lovaglio, 2012).

SAPROF (Structured Assessment of Protective Factors for violence risk) measures protective factors in three main domains (internal, motivational, and external). Two factors are static while the rest are dynamic (de Vries Robbé, 2011). To establish inter-rating reliability, 16 randomly selected cases from the discharged patient cohort and all patients from the hospitalized cohort were coded independently by two different evaluators.

Lastly, we implemented GAF – a rating scale reflecting the global impression of an individual's functioning, reflecting occupational, social, and psychological function ranging from 0 to 100 (Jones, 1995).

Statistical analyses

The first step in the data analysis was comparing participants' socio-demographic, crime, and treatment-related variables. Due to the restricted sample size and non-binary group composition of the socio-demographic variables, we performed logistic regression with the status (hospitalized versus discharged) as the outcome variable. Furthermore, the use of logistic regression allowed the investigation of more than one variable at once. In order to ensure the robustness of the test, the coefficients were bootstrapped 5000 times for 95% based

on 5000 samples[1], to provide an assessment of the effects highlighted by the analyses (Efron, 1993). As the next step of the analysis, we tested crime-related historical factors as predictors of being released or staying hospitalized via separate logistic regressions. Afterwards, we examined the patients' clinical factors, using a Chi-Square analysis to highlight the variables that are likely to be associated with the participants' current status. Lastly, we utilized logistic regression analysis with variables in which two groups differ to establish their association with the participants' current status as an outcome. The variables predictive of participants' current status were grouped and entered into a multiple logistic regression to identify the most relevant factors.

SPSS statistics software, version 23, produced by IBM Inc was used.

Results

Socio-demographic data

We found that a patient's diagnosis is unlikely to affect whether they are discharged or not (Table 1). Given the number of tests performed, we consider the results obtained as indicators of the difference between the groups rather than identifying predictors for discharge. Older patients were more likely to be discharged than younger ones. Patients who were widowed were significantly more likely to be discharged than singles. Those detained under high security before PT were significantly more likely to be discharged than those imprisoned. However, self-employed patients were significantly less likely to be discharged than those who were unemployed. Similarly, patients who lived in sheltered housing were significantly less likely to be discharged than those who owned a flat.

Table 1. Demographic data

	Hospitalized	Discharged	Total	Beta	Lower	Upper

[1] Unless otherwise specified.

				values	95% CI	95% CI
Age. Model $\chi^2(1) = 76.61$, $p < .001$						
age	40.9	45.76	43.39	.03	-0.1	.06
Length of stay. Model $\chi^2(1) = 76.61$, $p < .001$						
length of stay	2294.37	1649.33	1963.99	.00	-.001	.000
Marital status. Model $\chi^2(1) = 3.56$, $p > .05$, CI based on 3074 samples						
1. engaged	2%	2%	5%	.10	-21.33[b]	21.49[b]
2. in a relationship	5%	6%	11%	.33	-1.42[b]	2.14[b]
3. divorced	4%	7%	11%	.80	-.78[b]	21.30[b]
4. widower	0%	1%	1%	**21.31*** **	**20.80[b]**	**21.83[b]**
5. single	38%	34%	72%	Reference category		
Education. Model $\chi^2(2) = 2.89$, $p > .05$,						
1. elementary school	21%	21%	41%	reference		
2. high school with graduation	7%	15%	22%	-.69	-.49	2.18
3. high school without graduation	21%	15%	35%	-.35	-1.45	.66
Employment before treatment. Model $\chi^2(4) = 6.78$, $p < .05$, CI based on 3156 samples						
1. unemployed	22%	24%	46%	Reference		
2. full-time employment	4%	1%	5%	-1.20	-21.83	20.82
3. part-time employment	1%	7%	9%	1.67	-.14	21.59
4. self-employed	1%	0%	1%	**-21.31*** **	**-21.99**	**-20.64**

5. volunteer	0%	0%	0%			
6. other	21%	17%	38%	-1.1	-.56	.79
Was the patient ever employed (>10 hours per week) for at least six months? Model $\chi^2(3)$ =.83, p >.05, CI based on 3116 samples						
1. yes	13%	21%	34%	.53	-.62	1.83
2. no	13%	12%	26%	Reference		
3. unknown	22%	17%	39%	Treated as missing		
Housing before treatment. Model $\chi^2(6)$ =6.98, p>.05, CI based on 3141 samples						
1. own flat	7%	7%	15%	Reference		
2. living with family, relatives, a friend	15%	18%	33%	.22	-1.39	1.80
3. sheltered housing	1%	0%	1%	**-21.20*** **	**-22.59**	**-19.82**
4. lodging house	1%	6%	7%	1.61	-.79	22.18
5. without housing	10%	4%	13%	-.98	-21.34	.92
6. other	15%	15%	29%	.00	-1.65	1.61
Diagnosis. Model $\chi^2(4)$ =1.70, p>.05, CI based on 4969 samples						
Disorder due to substance abuse, (All F1 diagnoses)	78%	69%	73%	-.47	-1.69	.56
Psychotic disorders (MI), (All F2)	50%	55%	52%	-.17	-21.27	21.23
Personality disorders (PD), (All F6)	63%	52%	57%	-.60	-21.65	20.89

Comorbid PD and MI, (those who have any F2 and any F6)	18%	14%	16%	.26	-21.13	21.68
Protective treatment type. Model $\chi^2(4)$ =.62, p>.05, CI based on 4771 samples						
1. psychiatric	28%	32%	60%	Reference		
2. sex offender treatment	12%	11%	23%	-.23	-1.40	.92
3. substance abuse treatment	2%	1%	4%	-.82	-21.76	21.27
4. combination of above	6%	0%	13%	.06	-1.39	1.83
What proceeded PT. Model $\chi^2(6)$ =4.72, p>.05, CI based on 3069 samples						
1. imprisonment	11%	11%	22%	Reference		
2. high security	0%	1%	1%	**21.20****	**20.17**	**22.21**
3. hospitalization in a psychiatric ward	6%	7%	13%	.18	-1.55	2.08
4. outpatient PT	9%	11%	20%	.25	-1.28	1.79
5. home stay	17%	20%	37%	.13	-1.12	1.41
6. other	6%	1%	7%	-1.61	-21.98	.50

* *p<.05*
**p<.01
***p<.001

Crime-related factors

We found no difference between hospitalized and discharged patients in terms of the severity of the index offence. The model looking at the number of violent crimes committed was significant overall, $\chi 2$ (2) = 9.55, $p < .01$. The committing of a single violent crime was not significantly associated with the current status, b = .377, [-.80, 1.80], OR = 1.46, $p > .05$. However, the committing of more than one violent crime was significantly associated with remaining hospitalized (b = -.21.34, [-21.88, -20.81][2], OR = <.001, p <.001). The model looking at violent crimes committed during adolescence did not have a good fit, χ^2 (1) = 1.04, $p > .05$ and the current status of patients was not differentiated based on the committing of crime during adolescence, b = .66, [-.60, 2.21], OR = 1.93, $p > .05$.

Likewise, we carried out regression with the current state as the outcome variable and the history of sex-related offenses. The model did not have a good fit overall, $\chi^2(2) = 2.64$, $p > .05$, and the individual variables were not significantly associated with the current state of the participants. The committing of either one or multiple sex-related offences was not associated with being discharged or remaining hospitalized, b = -.32, [-1.36, .68][3], OR = .73, $p > .05$ and b = -1.63, [-21.87, .55], OR = .20, $p > .05$, respectively.

Institutional behaviour and treatment-related variables

Chi-squared analysis showed no significant differences between hospitalized and discharged patients regarding medication use, aggressive behaviour, pharmaco-resistance, compliance with pharmacotherapy, use of restraints, or absconding (Table 2: Institutional behaviour and treatment).

[2] CI estimates for this model are based on 3141 bootstrapped samples
[3] CI estimates for this model are based on 3141 bootstrapped samples

Table 2: Institutional behaviour and treatment

	assault of staff	serious assault on others	serious self-harm	successful ascension	return under the influence of alcohol	return under the influence of psychoactive substances	threads	seclusion episode(s)	restraint use	involuntary medication	antipsychotic medication	olanzapine equivalent
hospitalized	1%	10%	9%	20%	15%	11%	6%	1%	0%	0%	35%	20.03
discharged	1%	13%	2%	11%	17%	12%	2%	1%	0%	0%	33%	19.98
total	2%	23%	11%	30%	32%	23%	9%	2%	0%	0%	68%	20.00
chi-square (1)	.001	.85	2.86	3.28	.41	.15	feb.67	.001	n/a	n/a	.02	

	antidepressant	anxiolytic	thymostabilizers	antiandrogens	pharmacoresistance	pharmacotherapy adherence	**ward regime compliance**	therapeutic activities compliance	group psychotherapy	**psychoeducation**	substance abuse program	sex offender treatment program
hospitalized	15%	1%	18%	12%	20%	41%	**30%**	45%	39%	**17%**	16%	16%
discharged	18%	2%	11%	7%	17%	43%	**45%**	51%	45%	**6%**	23%	15%
total	33%	4%	29%	20%	37%	84%	**76%**	96%	84%	**23%**	39%	30%
chi-square	.77	.40	1.75	1.01	.60	.96	**6.06***	2.96	.66	**5.05***	2.47	1.30

	ergotherapy	outside the ward therapy	cognitive training	psychogymnastics
hospitalized	35%	46%	17%	15%
discharged	44%	49%	12%	12%
total	79%	95%	29%	27%
chi-square (1)	1.57	.003	.69	.13

*p<.05

**p<.01

***p<.001

We detected a significant intergroup difference for compliance with the ward's regime. Consequently, logistic regression was carried out with adherence to pharmacotherapy, ward regime and therapeutic activities as predictors. The model had a good fit, $\chi^2(3) = 10.17$, $p = .02$. Patients who complied with the ward regime and with therapeutic activities were more likely to be among those discharged than those who did not comply, b = 1.25, [.13, 2.89][4], OR = 3.48, $p > .01$ and b = 20.89, [19.32, 21.85], OR = 1180259303.49, $p > .001$, respectively. However, adherence to pharmacotherapy was not associated with the current status of the patients, b = .74, [-.85, 21.12], OR = 2.10, $p > .05$.

Lastly, we looked at the role of nosognosia—insight into illness—in predicting discharge. We defined the insight according to the HCR-20^{V3} C1 item (Douglas, 2013; Vňuková, 2020). The model had a good fit overall, $\chi2(2) = 23.52$, $p < .001$. Patients with both partial and full insight were more likely to be discharged than hospitalised compared to those who had none, b = 1.35, [.35, 2.61], OR = 3.86, $p > .01$ and b = 3.81, [2.24, 23.03], OR = 45.15, $p > .001$, respectively.

The model (Table 3 Treatment-related variables individually related to discharge, a stepwise model) showed that those who complied with therapy and had partial or full insight were more likely to be among those discharged than those who did not comply with the ward regime and therapeutic activities and had no insight. However, those who attended psychoeducation or sex offender treatment were more likely to be hospitalized.

Table 3: Treatment-related variables

[4] CI estimates for this model were based on 4779 bootstrapped samples

Variables	Bt. Lower 95% CI	Beta Coefficient	Bt Upper 95% CI	SE	Lower 95% CI	Odds ratio	Upper 95% CI
Regime compliance	-1.35	0.70	20.23	5.10	0.26	2.02	613076326.99
Therapy compliance	**0.53**	**20.05***	**22.12**	**5.47**	**1.69**	**508004061.20***	**4050069992.44**
Partial insight	**0.76**	**2.28****	**22.33**	**8.06**	**2.14**	**9.73****	**4986499512.29**
Full insight	**22.86**	**24.82***	**61.82**	**12.18**	**8454798610.24**	**5996338725.23***	**7069484631666390000000000**
Psychoeducation	**-22.99**	**-2.50****	**-1.02**	**8.20**	**<.001**	**0.08****	**0.36**
Sex offender treatment	**54.99**	**-2.68***	**-21.37**	**8.71**	**<.001**	**<.001***	**<.001**
Ergotherapy	-.24	1.08	20.32	5.24	0.29	2.95	664802126.36
Constant		-21.48		3.84			

*p<.05
**p<.01

Assessment tools

As displayed in Table 4, Assessment tool values, HoNOS-Secure scores were 7.7 among those hospitalized and 4.49 among those discharged, demonstrating a substantially higher level of unsatisfied needs in the hospitalized group. SAPROF scores demonstrate a relatively low level of internal and motivational protective factors present in our sample. The global assessment of functioning through GAF shows that most of our patients demonstrate moderate to severe functional impairment, while only three of our cohort show mild impairment.

Table 4 – Assessment tool values

	Hospitalised	Discharged	Total

HoNOS-Secure	7.7	4.59	6.11
HoNOS	6.53	2.88	4.66
HoNOS Beh	0.75	0.14	0.44
HoNOS Imp	1.25	0.95	1.09
HoNOS Sym	2.68	0.90	1.77
HoNOS Soc	1.85	0.88	1.35
SAPROF total	15.22	14.85	15.02
Inner score	3.05	3.67	3.38
Motiv Score	5.22	5.56	5.40
External Score	6.95	5.63	6.24
GAF Severe	22	22	44
GAF Moderate	18	17	35
GAF Mild	0	3	3

Assessment tools model

The model including three SAPROF factors was significant overall, $\chi^2(3) = 32.71$, $p<.001$. However, only SAPROF external factor scores were significantly associated with remaining hospitalized, b = -1.27, [-2.51, -.82][5], OR = .28, $p < .001$. Neither motivation nor external factors scores were associated with current status, b = .16, [-.16, .56], OR = 1.17, $p > .05$ and b = .21, [-.12, .64], OR = 1.23, $p > .05$, respectively.

Similarly, we investigated the association between the HoNOS and HoNOS-Secure scores and the current status of the patients. The model has a good fit, $\chi^2(2) = 34.56$, $p<.001$. Nevertheless, only the HoNOS-Secure score were negatively associated with being discharged, b = -.59, [-1.30, -.33], OR = .55, $p < 01$. Those with higher scores were 1.81 times more likely to be hospitalized rather than discharged than those with lower scores. The HoNOS score did not have a significant association with the current status of the patients, b = -.10, [-.54, .11], OR = .91, $p > .05$.

[5] CI for this model were based on 1000 bootstrapped samples

We explored the HoNOS and SAPROF tools intercorrelation (Table 5 Correlation matrix). There was a significant correlation between HoNOS-Secure and SAPROF motivational and external factors, between the HoNOS total score and SAPROF internal and motivational factors, and between the HoNOS behaviour factors and SAPROF internal factors, while HoNOS social correlated only with SAPROF motivational factors.

Table 5 Correlation matrix

	SAPROF	SAP inner	SAP motiv	SAP external	Total HoNSec Right	Total Score HoNOS Right	HoNOS Behaviour	HoNOS Impairment	HoNOS Symptom
SAPROF	1								
SAPinner	.86** [.077, .90]	1							
SAPmotiv	.92** [.87, .95]	.68** [.52, .79]	1						
SAPexternal	.44** [.24, .60]	0.11 [-.10, .31]	.22* [-.01, .43]	1					
Total HoNSec Right	-.13 [.34, .08]	-0.17 [-.36, .04]	-.26* [-.45, -.04]	.32** [.15, .48]	1				
Total Score HoNOS Right	-0.21 [-.38, -.02]	-.22* [-.04, -.01]	-.27* [-.45, -.08]	0.13 [-.05, .30]	.65** [.49, .77]	1			
HoNOS Behaviour	-0.21 [-.33, -.06]	-.29** [-.42, -.12]	-0.19 [-.37, .01]	0.11 [-.001, .23]	.47** [.25, .64]	.64** [.44, .78]	1		
HoNOS Impairment	-0.08 [-.28, .11]	-0.07 [-.3, .15]	-0.13 [-.33, .06]	0.07 [-.11, .24]	.47** [.19, .66]	.66** [.49, .77]	.34** [.10, .59]	1	
HoNOS Symptom	-0.17 [-.35, .04]	-0.20 [-.04, .05]	-0.17 [-.35, .02]	0.05 [-.14, .23]	.32** [.12, .52]	.66** [.50, .81]	.42** [.11, .64]	-0.01 [-.20, .21]	1
HoNOS Social	-0.14 [-.32, .05]	-0.09 [-.28, .11]	-.25* [-.43, -.06]	0.14 [-.03, .30]	.56** [.33, .73]	.78** [.58, .91]	0.20 [-.06, .57]	.55** [.26, .74]	.28* [.09, .49]

** *p<.01*

**p*<.05

SAPROF validation

Two evaluators assessed 56 patients using SAPROF, and the average interrater reliability was .87 [Min: 0.41; Max: 1.00].

Discussion

This study aimed to examine variables indicative of further detention or discharge from long-term inpatient PT. Most socio-demographic, personal-history, and treatment-related variables in our sample are in line with the findings of other studies showing a "typical" patient profile in long-term PT: it is challenging to treat patients with severe mental illness, substance abuse, or patients with paraphilia showing little treatment progress (Moran, 1999; Ross, 2012; Shah, 2011; Völlm, 2018). These patients have a higher social maladaptation level and demonstrate more disturbing institutional behaviour than shorter-stay patients (Andreasson, 2014; Eckert, 2017).

Discharge from long-term PT is always a difficult decision, so we attempted to identify factors currently underlying it at present praxis with the objective of a critical evaluation of their justification and to support the use of structured instruments for decision-making. In Bohnice hospital, PT inpatient discharge is a three-step decision process. The first step is at the ward management, where compliance with the ward regime and participation in therapeutic activities are necessary preconditions for the ward team to propose a patient as a discharge candidate. The second step is a case presentation at a clinical management meeting, chaired by the hospital director or head clinician (both fully qualified psychiatrists and sexologists). They consider the index offense, presented risks, treatment program accomplishment and availability, complexity, and type of community care. If a patient is approved, then the application for discharge to outpatient treatment is submitted to a responsible court, which either decides on its own or invites an independent forensic expert to assess the suitability of the discharge proposal. The analogical process also holds for high-security transfers. At all three steps, complex needs fulfilment, e.g., housing options, supervision level, and secure administration of drugs are taken into account.

A large proportion of our sample (46%) was unemployed before PT, which is in line with other findings from similar populations (Moran, 1999; Ross, 2012). Only 15% of our sample was able to live on their own before PT. The average length of stay for our cohort is 5.3 years (6.2 hospitalized and 4.5 discharged), while a comparison of LoS in countries with similar legal systems shows, for example, 5.8 years in Germany (Ross et al., 2012a) and 5.8 in Sweden (Andreasson, 2014). The average patient age of 43.4 years (40.9 hospitalized, 45.76 dismissed) is similar to forensic populations in Poland (43.4 years) (Gosek, 2020), British medium security (44 years) (Völlm, 2018), and the Netherlands (45 years) (Eckert, 2017).

Treatment-related dynamic variables and institutional behaviour significantly influenced the likelihood of being discharged or detained in our model. The main finding is the interconnection between therapeutic activity participation in the last six months and inpatient discharge. Ward regime compliance is a complex parameter corresponding to an H10(C5) factor of HCR-20 ^{v3} (problems with treatment or supervision response) (Douglas, 2013). Uncooperativeness anticipates future compliance problems after discharge from hospital (as conceptualized at HCR-20^{v3} R4 item). A decreased ability to cooperate or take part in therapeutic activities could also be manifestations of disorder symptoms, or clinical instability. We can draw an analogy with the DUNDRUM-3 program completion module (Davoren, 2013, 2015; O'Dwyer, 2011), as all our wards provide comprehensive treatment programs within the regime therapy model (Klapilová, 2019). Discharged patients absconded less and engaged in self-harm less often. Our findings also show that enrolment in a sex-offender treatment program predicted extended stay, consistent with other findings. Although somewhat counterintuitive, this can be explained by the fact that a sex-offender treatment program takes longer to complete (Ross, 2012).

In our sample, the diagnosis does not differentiate between our groups, similar to the findings of Davoren (Davoren, 2013). On the contrary, schizophrenia diagnosis or persistent symptoms were among the most frequently identified variables of prolonged stay (Huband, 2018; Sedgwick, 2016). More than half our patients have psychotic disorder diagnoses, often comorbid with substance abuse and personality disorders. Substance abuse problems are also associated with forensic long-stay (Andreasson, 2014) and are present, but not significant, in 73% of our sample. We infer that this probably contributes to the long-term hospitalization of our whole sample, but we could not identify significant intergroup differences.

Index crime severity (such as murder or attempted murder) was positively associated with long-stay status in previous studies (Ross, 2012; Völlm, 2018); we found no intergroup difference in our sample. The regression analysis did not show that committing severe crime leads to extended stay, not replicating previous findings (Andreasson, 2014; Davoren, 2015; Ross, 2012). We interpret this as a positive sign that our system is functioning, as PT does not supplement incarceration and the discharge process is mainly for medical reasons, in accord with Shah (Shah, 2011). At first offense, a patient's young age is among the strongest identified predictors of further reoffending (Farrington, 2005) and prolonged treatment (Sedgwick, 2016). Nevertheless, an early manifestation of offensive behaviour was not predictive in our model. The committing of more than one violent crime was significantly associated with remaining hospitalized (OR = 1x10-9, $p < .001$). We thus add to the evidence that chronic crime or multiple crimes are substantial violence risk factors (Andreasson, 2014; Boer, 1997) often associated with long-term forensic stay (Eckert, 2017; Gosek, 2020; Völlm, 2018).

Anosognosia, lack of insight (or having insight) (defined as a C1 HCR-20 item) in our sample predicted prolonged detention (or discharge from inpatient PT). Anosognosia is

linked with more severe psychopathology and complex cognitive function impairment in schizophrenia (Gerretsen, 2017). A lack of insight into psychotic disorders is challenging in terms of intervention. In our model, using psychotic disorder diagnosis and psychoeducation, attendance is a significant predictor of detention. We are thus in line with other findings demonstrating the limited efficacy of psychoeducation in increasing insight in psychotic disorders (Zhao, 2015). As part of sex-offender treatment, understanding and having insight into one's sexuality and the causes of offending behaviour are necessary preconditions for successful treatment (Klapilová, 2019; Weiss, 1999), while failing to achieve this results in treatment prolongation.

Within long-term forensic stay, a patient taking part in occupational therapy predicts discharge, demonstrating its importance within a treatment plan and the rehabilitative process, corresponding to the therapy compliance finding (Lindstedt, 2011). Occupational therapy increases user satisfaction with service provision, targeting independent living skills development and facilitating participation in meaningful roles within the community (Pettigrew, 2019).

The RNR model has dominated forensic care planning for two decades, primarily targeting so-called criminogenic needs (Andrews, 1998). However, focusing mainly on risk-reducing intervention makes care planning unbalanced, and so the involvement of multidomain tools providing general needs mapping such as CANFOR or HoNOS-Secure in the planning is therefore recommended (Dickens, 2017). Unmet needs can hinder patients' recovery (Vorstenbosch, 2020), and our hospitalized cohort has a higher level of unmet needs. Our results demonstrate that the main HoNOS scale does not add to the overall HoNOS-Secure discriminative ability, which is in line with previous knowledge (Shinkfield, 2016). The secure subscale captured the higher security needs level in the hospitalised cohort,

while the HoNOS-Secure score was negatively associated with being discharged. Comparing the security needs of our population in medium and low secure wards with an adequate population from the UK shows a significantly lower needs level in our sample (7.7 for hospitalized and 4.49 for discharged versus approx. 13) (Dickens, 2017). The average SAPROF score of 15 points is comparable with other findings (Oziel, 2020). We see intercorrelation between the HoNOS-Secure and SAPROF external subscales, but only the external dimension of SAPROF was associated with the current state of participants. Those with higher SAPROF external factor scores were 3.58 times more likely to be hospitalized than discharged than those with lower scores. Here, the HoNOS-Secure subscale and SAPROF probably cover the same construct—external control or the need for a secure environment.

The majority of our patients demonstrated substantial functional impairment (GAF < 70 in 96% of the cohort), while a lower GAF score is associated with a longer stay (Andreasson, 2014; Sedgwick, 2016) or a lower probability of discharge (Davoren, 2013). Functionality disruption measured by GAF can be associated with cognitive impairment, creating a foundation for the emergence of a range of violence risk factors, including deficits in social reasoning, symptoms, or social functioning (O'Reilly, 2015). Therefore, a severe or moderate GAF score points to the risk present in those patients.

Conclusion

Our primary aim was to identify the factors associated with prolonged forensic hospitalization or discharge into the community, and to validate the usefulness of the instruments used in aiding decision-making regarding discharge from a forensic hospital. We also provided the first report exploring socio-demographic, personal-history, and treatment characteristics of PT patients from Czechia. Overall, our long-stay forensic cohort presents a

high social maladaptation level, but differences in minor or major transgressions of ward rules were insignificant in the between-group. Our findings identified a lack of insight, inability to cooperate with the ward regime, and psychotherapy and ergotherapy as increasing the likelihood of prolonged detention. This inability to pro-socially participate in treatment is not diagnosis-driven, while medication also makes no difference. The committing of more than one violent crime in the past was significantly associated with remaining hospitalized, reflecting the higher tendency to split the hospitalized cohort or motivational state, respectively. The instruments used can capture dynamic factors related to discharge or continuing hospitalization, namely the SAPROF total or external factors score, the HoNOS-Secure subscale, and significant items from HCR-20 clinical and risk subscales. The whole cohort also demonstrates significant functional impairment according to GAF. Hence we were able to identify critical dynamic factors that impact clinical evaluation during treatment concerning conditional discharge from inpatient treatment. These factors capture patients' ability to comply with internal facility rules, to comprehend the risks (or disease) present, and to participate in the offered therapeutic modalities. The question remains whether the presented risks in patients who cannot comply with the facility regime or who are not motivated to participate in therapeutic activities are significant enough to justify long-term inpatient protective treatment. If this is not the case, there is a need to develop specialized social facilities, e.g., sheltered housing facilities that can support this target group. Another option could be building flexible assertive community teams or specialized services such as forensic community teams. However, more research is needed to capture the key factors underlying the therapeutic change, the role of protective factors in decisions on discharge, and patient needs in community care after long-term forensic treatment hospitalization.

Study limitations

Our study was carried out in a hospital responsible for about 10% of inpatient PT in Czechia, and is not representative of Czechia's forensic long-stay population. Our sample size also limits the descriptive power of the results. We only identified forty forensic long-stays, and a larger-scale study is needed to give a more detailed picture of the forensic population. We are also careful to generalize our findings in terms of the other forensic facilities in Czechia, as they can differ in their treatment programs and patient population composition. Preliminary data show that in forensic facilities in Czechia there are significant differences in length of treatment and relative patient numbers. Non-medical factors can influence discharge from hospital, such as more frequent recruitment of forensic experts in other areas by a court. The resulting expertise significantly extends the duration of treatment. It also remains unclear whether the obtained results can be generalized over the total inpatient PT population, including short-term forensic treatments. We focused mainly on protective factors and needs, however using complete risk assessment tools such as HCR-20, e.g., enabling a HCR-20-SAPROF score calculation, could add to the complexity of the results.

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