Cyrilometodějská
teologická fakulta

Univerzita Palackého
v Olomouci

Institut sociálního zdraví (OUSHI)

Mgr. Bibiána Jozefiaková

Reziliencia a jej význam pre duševné zdravie

Dizertačná práca

školitel: prof. MUDr. Jozef Hašto, PhD.

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Prehlasujem, že som prácu vypracovala samostatne a všetky použité informačné zdroje som uviedla v zozname literatúry.

V Olomouci dňa 12.3.2024 Podpis ……

Poďakovanie

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Key words: resilience, posttraumatic growth, posttraumatic stress disorder, substance use disorder, anxiety, COVID-16 anxiety, depression, pandemic

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KAPITOLA 1

ÚVOD

V posledných rokoch sa pozornosť výskumníkov/-čok a iných odborníkov/-čok na duševné zdravie čoraz častejšie zameriava na tzv. protektívne faktory duševného zdravia, a to najmä v súvislosti s globálnymi výzvami, akými sú napríklad pandémia COVID-19 či aktuálne geopolitické konflikty. Lepšie porozumenie protektívnym faktorom a mechanizmom ich pôsobenia je kľúčové pre zabezpečenie a udržiavanie celkovej duševnej pohody. Aktuálne výskumné zistenia zdôrazňujú úlohu reziliencie respektíve odolnosti v tomto procese, a to najmä v kontexte prežitých stresujúcich a traumatických životných udalostí. Hlavným cieľom dizertačnej práce je tak overiť súvislosti medzi rezilienciou a duševným zdravím a to u rôznych populácií (osoby s diagnostikovanou závislosťou od alkoholu a iných psychoaktívnych látok, stredoškolskí/-é a vysokoškolskí/-é študenti/-ky a reprezentatívna vzorka dospelej populácie) so zreteľom na prežité traumatické a stresujúce životné udalosti.

1 Reziliencia

Pojem reziliencia (odolnosť) označuje dynamický a komplexný koncept, ktorý je dôležitý nielen z psychologického a sociálneho hľadiska. Vnímanie reziliencie aj v ekonomickom kontexte je, vzhľadom na prevalenciu a vplyv stresom podmienených ochorení na globálnu ekonomiku, potrebné. Priamy a nepriamy vplyv stresu je pre predstavu v Európe odhadovaný na cca 200 miliárd eur ročne (Olesen et al., 2012). Na základe údajov Národného centra zdravotníckych informácii Slovenskej republiky (NCZI) z roku 2020 môžeme usudzovať, že z celkového počtu 364 464 osôb ošetrených v psychiatrických ambulanciách na Slovensku tvorilo celkovo 25,7 % tých, ktorí ambulancie navštívili kvôli neurotickým, stresom podmieneným a somatoformným poruchám (Národné centrum zdravotníckych informácií, 2021). V roku 2022 bolo v psychiatrických ambulanciách celkovo ošetrených 417 530 osôb, pričom ľudia s neurotickými, stresom podmienenými a somatoformnými poruchami tvorili celkovo 27,2% (Národné centrum zdravotníckych informácií, 2023). Aj z týchto dôvodov v posledných rokoch stúpa záujem o vedecké preskúmanie toho, čo prispieva k posilneniu reziliencie jednotlivcov.

1.1 Vymedzenie pojmu

V súčasnosti neexistuje jednotná definícia reziliencie. Zatiaľ čo niektorí výskumníci ju definujú ako schopnosť lepšie sa adaptovať na stresujúce životné udalosti (Luthar et al., 2000), iní na ňu nahliadajú skôr ako na schopnosť zostať zdravý a fungovať v živote aj napriek pretrvávajúcemu stresu (Bonanno, 2008). Na základe definície Americkej psychologickej spoločnosti je na rezilienciu nahliadané ako na proces funkčnej adaptácie na stresujúce a traumatické okolnosti (Americká psychologická asociácia, 2014). V rámci tejto definície je zdôrazňované tzv. „dať sa do poriadku“ (angl. „bounce back“) po prežití silnej stresujúcej situácie. V tomto ponímaní môžeme na rezilienciu nahliadať ako na kontinuum idúce od nízkej schopnosti adaptácie a zvládania až po vysokú schopnosť (Pietrzak & Southwick, 2011) a ktoré sa tiež môžu líšiť naprieč rôznymi oblasťami života (Southwick et al., 2014).

1.2 Reziliencia a duševné zdravie

Na základe aktuálnych výskumných zistení môžeme usudzovať, že reziliencia je v pozitívnom vzťahu s duševným zdravím a môže tak napomáhať k jeho udržiavaniu a zlepšovaniu (Gheshlagh et al., 2017). Ľudia s vyššou rezilienciou využívajú často užitočnejšie copingové mechanizmy, emočnú reguláciu a majú lepšie zručnosti na riešenie problémov, čo prispieva k lepšiemu duševnému stavu (Fergus & Zimmerman, 2005; Southwick et al., 2014). Vzhľadom na to, že na rezilienciu nahliadame ako na kontinuálnu premennú, je dôležité rozumieť tomu, ktoré faktory ju môžu ovplyvniť.

Aktuálne je na rezilienciu nahliadané ako na koncept, ktorý je najlepšie uchopiteľný ako proces interakcie viacerých systémov (biologických, psychologických, sociálnych a ekologických), ktorý pomáha človeku obnoviť, udržať a/alebo zlepšiť jeho duševnú pohodu v strete s jedným, prípadne viacerými rizikovými faktormi (napr. stres, zvýšená záťaž; Ungar & Theron, 2019). Z biologického pohľadu, bola v rámci výskumu potvrdená súvislosť medzi konrétnymi génmi a rezilienciou (pre lepší prehľad viď Niitsu et al., 2018). Ide najmä o gény spájané s HPA osou, noradrenálnym, dopaminergným a serotonergným systémom (Russo et al., 2012; Maul et al., 2020). Významnú úlohu zohráva aj epigenetika ako funkčná modifikácia genómu bez zmien v sekvencii DNA (Wu et al., 2013). Epigenetické zmeny môžu byť dôsledkom pôsobenia stresu v kritických obdobiach vývinu človeka. Dôležitú úlohu v celkovom budúcom fungovaní a tiež zvládaní záťažových situácií zohráva obdobie raného detstva. Stresujúce

a traumatické zážitky v tomto období môžu významne ovplyvniť systém zvládania stresu a tým potenciálne vplývať aj na duševné a iné ťažkosti v dospelom veku (napr. Švecová et al., 2023; Kascakova et al., 2022). V tomto kontexte je potrebné zdôrazniť (okrem vyššie spomínaných hormónov) aj význam oxytocínu, ako hormónu stimulujúceho sociálne interakcie a podporujúce vzťahovú väzbu (napr. Scatliffe et al., 2019) a tiež vstupujúceho do schopnosti zvládať stres (napr. Shamay-Tsoory & Young, 2016). Veľkú úlohu v celkovom budovaní reziliencie zohrávajú aj psychologické faktory, medzi inými individuálne vlastnosti osoby, kognitívne procesy, schopnosť emočnej regulácie a copingové stratégie (Wu et al., 2013). Jedným z dôležitých psychologických faktorov, ktoré prispievajú k vyššej odolnosti je optimizmus, definovaný ako očakávanie pozitívnych dôsledkov v budúcnosti (Carver et al., 2010; Iacoviello et al., 2014; Wu et al., 2013). S optimistickým nastavením voči budúcnosti súvisí aj ďalšia dôležitá zložka reziliencie, ktorou je schopnosť kognitívneho prehodnocovania (angl. „cognitive reappraisal"; „cognitive flexibility" alebo „cognitive reframing"). Tá súvisí najmä so schopnosťou dokázať sa na situáciu pozrieť z iného uhľa pohľadu, zohľadňujúc pritom význam a dôsledky stresujúcich situácií (Iacoviello et al., 2014; Wu et al., 2013). Konkrétne copingové stratégie, ktoré daný jedinec využíva na zvládanie stresu, vo veľkej miere súvisia aj s celkovou úrovňou reziliencie. Vo všeobecnosti je možné rozlíšiť maladaptívne (sem môžeme zaradiť tendenciu k vyhýbaniu) a adaptívne (riešenie problémov, behaviorálne a/alebo psychologické stratégie zamerané na zmenu kvality stresu resp. toho, ako je vnímaný, čo súvisí aj s kognitívnou prácou) copingové stratégie (Wu et al., 2013). S vyššou úrovňou reziliencie súvisia skôr aktívne copingové stratégie, plánovanie, pozitívne preformulovanie (angl. „positive reframing"), efektivita cieľov (angl. „goal efficacy") a sociálna opora (Van der Hallen et al., 2020).

2 Trauma a duševné zdravie

Približne 70 % ľudí (Benjet et al., 2016) zažije počas svojho života traumatickú udalosť, definovanú ako udalosť vyvolávajúcu silný strach, pocity bezmocnosti alebo hrôzy (APA, 2013). V rámci diagnostického a štatistického manuálu duševných porúch je traumatická udalosť definovaná ako zážitok (ne)priameho ohrozenia života, sexuálneho alebo iného násilia (APA,2013; APA, 2018). Pri definovaní traumy je dôležité zdôrazniť, že skôr ako o konkrétny typ udalosti ide o našu skúsenosť s ňou (Vojtová, 2023). Z psychologického pohľadu tak môže byť užitočné nazerať na psychickú traumu skrz optiku integrácie prežitého zážitku do chápania sveta a seba samého (Moskowitz &

van der Hart, 2019). V posledných rokoch je prežitá traumatická udalosť v centre pozornosti (nielen) výskumníkov/-čok, ktorí/-é sa snažia čo najlepšie preskúmať dopady takéhoto zážitku na psychiku človeka. V dôsledku psychickej traumy sa môže rozvinúť viacero psychických, telesných, ale aj psychosomatických symptómov. Podľa najnovších výskumných zistení je riziko duševného ochorenia u ľudí s prežitou traumatickou udalosťou v anamnéze až 3x vyššie (Hogg et al., 2023). História traumy sa objavuje u ľudi s depresiou (napr. Humphreys et al., 2020), úzkostnými poruchami (napr. Miller & Brock, 2017) alebo u ľudí so závislosťami (napr. Roberts et al., 2022). Často je však spájaná aj so somatickým zdravím (napr. Afari et al., 2014). Samostatné miesto v diagnostike duševných porúch špecificky spojených s prežitou traumatickou udalosťou má posttraumatická stresová porucha, ktorej celková prevalencia je na úrovni približne 10 % u žien a 5 % u mužov (Olff, 2017).

2.1 Posttraumatická stresová porucha

Prežitá trauma a jej význam pre duševné zdravie sa do záujmu odborníkov/-čok dostala v povojnovom období, kedy sa pozornosť venovala najmä skúmaniu psychologického distresu u vojnových veteránov a ľudí, ktorí prežili koncentračné tábory (Keane et al., 2006). V dôsledku toho bola diagnóza posttraumatickej stresovej poruchy pridaná v roku 1980 aj do Diagnostického a štatistického manuálu (DSM III; APA, 1980). Piata revízia DSM definuje PTSP ako psychickú poruchu, ktorá sa objavuje po prežití jednej alebo viacerých traumatických udalostí definovaných ako (ne)priame vystavenie sa smrti alebo ohrozeniu života, vážnemu úrazu alebo sexuálnemu násiliu a zaraďuje ju do kategórie porúch spojených so stresom (APA, 2013). Podobne je PTSP popísaná aj v aktuálne platnej desiatej revízii Medzinárodnej klasifikácii duševných porúch (MKCH 10), pričom sa nachádza v kategórii úzkostných porúch (WHO, 2015) pod číslom F43.1 (pre presnejší popis diagnostických kritérií a ich zmien naprieč rôznymi verziami diagnostických manuálov pozri Tabuľku 1). Ľudia s PTSP prežívajú ťažkosti v kognitívnej (opakujúce, znepokojujúce a nechcené spomienky a/alebo sny spojené s konkrétnou traumatickou udalosťou; znovuprežívanie traumatickej udalosti angl. „flashbacks“); afektívnej (pocity silného rozrušenia, hnevu, strachu, viny, či hrôzy; strata záujmov; pocity osamelosti; ťažkosti s prežívaním pozitívnych emócií); telesnej (zvýšená ostražitosť; pocity nervozity; ťažkosti so zaspávaním alebo spánkom; búšenie srdca, ťažkosti s dýchaním, potenie) a behaviorálnej (vyhýbanie sa spomienkam, myšlienkam alebo pocitom, ktoré sú spojené s traumatickou udalosťou prípadne podnetom, ktoré

udalosť pripomínajú; podráždené správanie, výbuchy hnevu alebo agresívne správanie; nadmerné riskovanie alebo robenie rizikových činností) rovine. V rámci jedenástej revízie MKCH sa pohľad na posttraumatickú stresovú poruchu rozšíril o komplexnú posttraumatickú stresovú poruchu, ktorá sa spája s opakujúcou sa traumatizáciou v dôsledku ktorej má jedinec okrem iného aj problémy so vzťahovou väzbou, pocitmi bezpečia a dôverou (Olff et al., 2019).

Tabuľka 2.1 Rozdiely v popisovaných symptómoch posttraumatickej stresovej poruchy naprieč jednotlivými klasifikačnými manuálmi

Symptóm	**DSM-IV**	**DSM 5**	**MKCH-10**	**MKCH-11**
(A) Vystavenie traumatickej udalosti				
A1. Priame prežitie traumatickej udalosti	x	x	//	//
A2. Svedok traumatickej udalosti	x	x	//	//
A3. Traumatická udalosť sa stala členom rodiny/blízkym kamarátom	X	x	//	//
A4. Vystavovanie traumatickej udalosti v rámci povolania	X	x	//	//
(B) Intruzívne symptómy				
B1. Pravidelné, nedobrovoľné a vtieravé spomienky na traumu	X	x	x	x
B2. Pravidelné sny, ktorých obsah a/alebo (negatívna) valencia sú spojené s traumatickou udalosťou	x	x	x	x
B3. Disociatívne reakcie (tzv. flashbacks)	X	x	x	x
B4. Intenzívny/predĺžený psychologický distres pri vystavení sa interným/externým podnetom, ktoré pripomínajú traumu	x	x	-	-
B5. Zjavné fyziologické reakcie na interné alebo externé podnety, ktoré pripomínajú alebo symbolizujú aspekt traumatickej udalosti	x	x	-	-
(C) Vyhýbanie sa stimulom spojeným s udalosťou				
C1. Vyhýbanie sa (snaha sa vyhnúť) myšlienkam, spomienkam alebo pocitom, ktoré sú spojené s traumatickou udalosťou	x	x	x	x
C2. Vyhýbanie sa (snaha sa vyhnúť) podnetom z vonku, ktoré udalosť pripomínajú	x	x	x	x
(D) Negatívne zmeny v nálade a kogníciách spojené s udalosťou				
D1. Neschopnosť spomenúť si na dôležité aspekty traumatickej udalosti	x	x	-	-
D2. Trvalé a prehnané negatívne presvedčenia/očakávania o sebe, druhých a o svete	-	x	-	-

D3. Trvalé, skreslené myšlienky o príčinách/dôsledkoch traumatickej udalosti, ktoré vedú k sebaobviňovaniu/obviňovaniu druhých	-	x	-	-
D4. Trvalé negatívne emocionálne prežívanie (napr. strach, hnev, vina)	x	x	X	X
D5. Znížený záujem/účasť na významných aktivitách	x	x	-	-
D6. Pocity odlúčenia/odcudzenia od druhých	x	x	-	-
D7. Trvalá neschopnosť prežívania pozitívnych emócií	x	x	x	-
(E) Výrazná zmena správania a reaktivity spojená s udalosťou				
E1. Podráždené správanie a výbuchy hnevu (pri malej/žiadnej provokácii) – fyzická/verbálna agresivita voči druhým	x	x	-	-
E2. Bezohľadné/seba-deštruktívne správanie	-	x	-	-
E3. Nadmerná bdelosť (hypervigilancia)	x	x	x	x
E4. Prehnané úľakové reakcie	x	x	x	x
E5. Problémy s koncentráciou	x	X	-	-
E6. Problémy so spánkom	x	x	X	-

Poznámka: x = popisovaný symptóm sa nachádza v konkrétnej verzii klasifikácie; X= symptóm sa nachádza c konkrétnej verzii klasifikácie v mierne upravenej podobe; - = symptóm sa nenachádza v konkrétnej verzii klasifikácie; // = symptóm nie je v klasifikácii bližšie špecifikovaný (verzia tabuľky modifikovaná podľa Jozefiaková, 2020)

2.2 Posttraumatický rozvoj

Slovo trauma má v bežnej reči skôr negatívny konotát, čo ešte podporuje celkové negatívne vnímanie jej dôsledkov (Sumalla et al., 2009). V posledných rokoch sa však pozornosť výskumníkov/-čok obracia smerom k pozitívnym vyústeniam traumatických udalostí na život ľudí, čo označujeme pojmom posttraumatický rozvoj (Tedeschi & Calhoun, 2004). Nejde však len o zvládnutie náročnej životnej situácie, ale skôr o zlepšenie vo viacerých oblastiach života (interpersonálne vzťahy, nové príležitosti, osobná sila, porozumenie životu a spirituálna zmena; Tedeschi & Calhoun, 1996). Autori pojmu, Tedeschi a Calhoun, popisujú PTG pomocou prirovnania prežitej traumy k seizmickej udalosti, ktorá človekom otrasie a môže tak zničiť a rozbiť pôvodné schémy porozumenia svetu, prežívania zmysluplnosti, či rozhodovania. Po zemetrasení sa zväčša pracuje na obnove vzniknutých škôd, pričom nové budovy sú spravidla odolnejšie a pevnejšie. PTG je podľa autorov najlepšie uchopiteľné ak ho prirovnávame práve k tejto obnove škôd. Schémy myslenia, vnímanie sveta a spôsob života môžu byť skrz túto prizmu v dôsledku prežitej traumy posilnené (Tedeschi & Calhoun, 2004). Autori v rámci citovanej práce opisujú niekoľko faktorov, ktoré môžu mať vplyv na posttraumatický

rozvoj, ako napríklad už spomínaná extraverzia, otvorenosť novým skúsenostiam alebo optimizmus. Veľmi dôležitú úlohu zohráva aj sociálne okolie, opora a celková blízkosť vzťahov, ktoré človek má (Jia et al., 2017). Ľudia, ktorí majú od svojho okolia väčšiu mieru podpory prežívajú z dlhodobého hľadiska aj vyššiu mieru pozitívnych emócií, čo pravdepodobne súvisí aj s PTG (Rzeszutek, 2017).

Môže sa zdať, že posttraumatická stresová porucha a posttraumatický rozvoj sú dva protipólne dôsledky prežitia traumatickej životnej udalosti, ktoré sú vzájomne nezávislé. Hoci výskum v oblasti psychotraumatológie sa v posledných rokoch výrazne posúva, stále nie je úplne jasné, aká je povaha vzťahu medzi PTSP a PTG. Existuje však viacero výskumníkov/-čok, ktorí/-é sa prikláňajú k názoru, že PTSP a PTG sa vzájomne nevylučujú a môžu sa u človeka objaviť aj súbežne (Shakespeare-Finch & Lurie-Beck, 2014; Zalta et al., 2016; Marzillano et al., 2020).

3 Cieľ a štrukútra dizertačnej práce

3.1 Cieľ práce

Hlavným cieľom práce je overiť súvislosti medzi rezilienciou a duševným zdravím a to v rámci rôznych kontextov, pričom dôraz je kladený najmä na funkciu reziliencie v spojení s prežitými stresujúcimi a traumatickými životnými udalosťami. Skúmaný je vzťah medzi rezilienciou a posttraumatickým rozvojom, posttraumatickou stresovou poruchou (reprezentatívna vzorka dospelej populácie a klinická populácia ľudí s poruchou užívania látok) a duševným zdravím spojeným so špecifickými pandemickými okolnosťami (stredoškolskí/-é a vysokoškolskí/-é študenti/-ky).

Formulované výskumné otázky:

1) Aká je súvislosť medzi rezilienciou a posttraumatickým rozvojom?

2) Aký je význam reziliencie v kontexte rozvoja posttraumatickej stresovej poruchy u ľudí s diagnózou poruchy užívania psychoaktívnych látok?

3) Ako súvisí reziliencia s prežívaním úzkosti a úzkosti špecificky spojenej s pandémiou COVID-19?

4) Do akej miery je reziliencia stabilná v čase? Líši sa táto zmena vzhľadom k sociodemografickým charakteristikám (rod, vek, partnerský status) a prežitej traumatickej udalosti?

3.2 Štruktúra dizertačnej práce

Táto dizertačná práca je zložená zo štyroch publikovaných článkov v pôvodnom znení a dvoch článkov pripravených na publikovanie. Päť prezentovaných štúdií je v anglickom jazyku a jedna v slovenskom jazyku, pričom všetky odkazy na použitú literatúru sú uvádzané na konci každej kapitoly.

Kapitola 1 je zároveň úvodom k dizertačnej práci. Súčasťou kapitoly je vymedzenie pojmov reziliencia, posttraumatická stresová porucha a posttraumatický rozvoj a zároveň je špecifikovaný cieľ práce a jednotlivé výskumné otázky.

Kapitola 2 obsahuje prehľad použitých výskumných vzoriek, štatistických a dotazníkových metód.

Kapitola 3 obsahuje validáciu dotazníka posttraumatického rozvoja (PTGI; Posttraumatic Growth Inventory) a jeho súvislosti s rezilienciou v rámci reprezentatívnej vzorky dospelej populácie obyvateľov/-iek Slovenska.

Kapitola 4 obsahuje štúdiu zameranú na zmapovanie výskytu stresujúcich a traumatických udalostí prežívaných u ľudí so syndrómom závislosti od alkoholu a iných psychoaktívnych látok.

Kapitola 5 využíva možnosti sieťového prístupu na preskúmanie súvislostí medzi rezilienciou a posttraumatickou stresovou poruchou (PTSP) u ľudí s poruchou užívania látok a porovnáva túto štruktúru so štruktúrou pozorovanou vo všeobecnej populácii.

Kapitola 6 obsahuje štúdiu zameranú na skúmanie úzkosti spojenej s COVID-19 a jej prediktorov u adolescentov/-iek na Slovensku.

Kapitola 7 obsahuje štúdiu zameranú na bližšie preskúmanie duševného zdravia a reziliencie v období po najprísnejších reštriktívnych opatreniach u vysokoškolských študentov/-iek.

Kapitola 8 v sebe zahŕňa štúdiu zaoberajúcu sa meraním reziliencie vo viacerých časových bodoch (medzi rokmi 2020-2023), s ohľadom na rod, vek, partnerský status a prežitú traumatickú skúsenosť.

Kapitola 9 sumarizuje najdôležitejšie výskumné zistenia dizertačnej práce a zahŕňa tiež všeobecnú diskusiu a praktické implikácie pre jednotlivé zistenia.

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KAPITOLA 2

Zdroje údajov

2.1 Popis výskumných súborov

V *kapitole 3* sme pracovali s reprezentatívnou vzorkou dospelých obyvateľov/-iek Slovenska. Dáta boli zbierané v apríli 2019 formou osobného štruktúrovaného rozhovoru s elektronickým zaznamenávaním odpovedí. Celkovo boli v rámci širšej dotazníkovej batérie vyzbierané odpovede od 1018 respondendov/-iek. Reprezentatívnosť vzorky bola zabezpečená na základe kvótnych znakov – rod (496 mužov), vek (s vekovým rozmedzím od 18 do 85, priemerný vek = 46,24, SD = 16,6), vzdelanie, národnosť, veľkosť sídla a región, stanovených na základe údajov zo Štatistického úradu Slovenskej republiky. Pomocou Dotazníka životných stresorov sme identifikovali 721 participantov (71%), ktorí prežili traumatickú alebo stresujúcu životnú udalosť. Týmto respondentom/-kám bol následne administrovaný dotazník Posttraumatického rozvoja (Posttraumatic Growth Inventory).

V *kapitole 4* sme na klinickej vzorke, ktorú tvorilo 51 ľudí s diagnostikovanou závislosťou od alkoholu (N=34) alebo od iných psychoaktívnych látok (N=17) mapovali výskyt stresujúcich a traumatických životných udalostí. Vo výskumnej vzorke bolo celkovo 38 mužov a priemerný vek respondentov bol 45,9 roka (SD=5,94). Dáta zbierali vyškolení/-é psychológovia/-ičky a psychiatri/-čky formou osobného štruktúrovaného rozhovoru s elektronickým zaznamenávaním odpovedí a tie boli následne anonymizované. Dáta boli zbierané v mesiacoch september-december 2020. Následne boli tieto dáta porovnávané s údajmi reprezentatívnej vzorky dospelých obyvateľov/-iek Slovenska (výskumná vzorka použitá v rámci *kapitoly 1).*

V *kapitole 5* sme pracovali rovnako s klinickou vzorkou ľudí s diagnostikovanou závislosťou od alkoholu a iných psychoaktívnych látok. V tomto prípade boli dáta zbierané v období medzi októbrom 2021 a aprílom 2022 rovnako formou osobného štrukturovaného rozhovoru s elektronickým zaznamenávaním odpovedí. Výslednú výskumnú vzorku tvorilo 74 participantov/-iek, pričom bolo pomocou Dotazníka životných stresorov identifikovaných 69 z nich (93%), ktorý prežili traumatickú alebo stresujúcu životnú udalosť. Týmto respondentom/-kám bol následne administrovaný PTSP checklist (PCL-5). Tieto dáta boli následne porovnávané s reprezentatívnou vzorkou dospelej populácie Slovenska (zabezpečenej na základe kvótnych znakov – rod,

vek, vzdelanie a región) zbieranej online formou v júli 2022. Celkovo reprezentatívnu vzorku tvorilo 1819 respondentov/-iek z ktorých 944 (52%) prežilo traumatickú alebo stresujúcu životnú udalosť (na základe dotazníka Stressful Life Events Screening Questionnaire – SLES).

V *kapitole 6* sme sa zamerali na populáciu slovenských adolescentov/-iek. Celkovo boli vyzbierané odpovede od 1786 adolescentov/-iek vo veku od 15 do 19 rokov (priemerný vek = 16,8, SD = 1,2). Dáta boli zbierané online formou od 13. apríla do 24. mája 2021.

V *kapitole 7* výskumnú vzorku tvorilo 2107 vysokoškolských študentov/-iek zo Slovenska vo veku 18-62 rokov (priemerný vek = 22,73, SD = 3,77). Dáta boli rovnako zbierané online formou.

V kapitole 8 tvorilo výskumnú vzorku 1342-1949 dospelých obyvateľov /-iek Slovenska (početnosť sa líšila v závislosti od jednotlivých časových vĺn zberov). Priemerný vek bol v tomto prípade 40,77 roka (SD=14,67) . Dáta boli vo všetkých vlnách zbierané online formou.

2.2 Použité metódy

V rámci jednotlivých kapitol bolo použitých niekoľko dotazníkových metód:

1) Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996). Tento dotazník meria posttraumatický rozvoj u ľudí, ktorí prežili traumatickú udalosť, pričom obsahuje 21 položiek. Každý položka spadá do jedného z piatich faktorov: (1) vzťahy s druhými, (2) nové možnosti, (3) osobná sila, (4) spirituálna zmena a (5) pochopenie života. Tento dotazník bol použitý v kapitole 3.

2) Brief Resilience Scale (Smith et al., 2008), ktorý meria rezilienciu ako schopnosť zotaviť sa zo stresujúcej udalosti bol v rámci práce použitý v kapitolách 3 a 5-8. Obsahuje celkovo šesť položiek s odpoveďovou stupnicou 1 (silne nesúhlasím) po 5 (silne súhlasím).

3) Spiritual Well-Being Scale (Paloutzian & Ellison, 1982) meria spiritualitu a životnú spokojnosť pomocou dvadsiatich položiek, ktoré spolu tvoria dve subškály (existenciálna a náboženská spokojnosť. Dotazník bol použitý v rámci kapitoly 3.

4) Functional Assessment of Chronic Illness, bol pôvodne vytvorený pre ľudí s vážnym ochorením (FACIT, Peterman a kol., 2002). V rámci tejto práce bol použitý v kapitole 3,

pričom bola využitá 12-položková verzia upravená pre ľudí bez vážnejšieho ochorenia (Brintz a kol., 2017).

5) Life Stressor Checklist (LSC-R, Wolfe et al., 1996) je dotazník zložený z 30 položiek, z ktorých 19 položiek sa zameriava na zážitky, ktoré podliehajú definícii traumy, 9 otázok opisuje iné zaťažujúce životné situácie a 2 otvorené otázky, v rámci ktorých je možnosť doplniť prípadné ďalšie traumatické zážitky. V rámci práce bol dotazník použitý v kapitolách 3-5.

6) COVID anxiety scale (CAS; Silva et al., 2020) je 7 položkový dotazník, ktorý meria úzkosť prežívanú v súvislosti s ochorením COVID-19. Dotazník bol v rámci práce použitý v kapitole 6.

7) SF-8 health survey (v slovenskej verzii, ktorá je podobná ako česká verzia autorov Bartuskova et al., 2018) je celkovo zložený z 8 položiek, ktoré spolu tvoria 8 subškál: (1) všeobecné vnímanie zdravia, (2) fyzické fungovanie, (3) obmedzenie fyzických aktivít, (4) telesná bolesť, (5) vitalita, (6) sociálne fungovanie, (7) vnímanie psychického zdravia a (8) emočné obmedzenie rolí. Dotazník bol použitý v kapitole 6.

8) The experiences in close relationships-revised for adolescents (ECR-R; Wilkinson, 2011) bol v rámci práce použitý v kapitole 6. Ide o 20-položkový dotazník posudzujúci vzťahovú väzbu v dvoch dimenziách: úzkostnosť (angl. „attachment anxiety“) a vyhýbavosť (angl. „attachment avoidance).

9) PTSD checklist (PCL-5, Weathers et al., 2013) bol použitý na meranie symptómov PTSP definovaných podľa DSM-5. Celkovo PCL-5 obsahuje 20 položiek, ktoré tvoria 4 subškály (klastre B-E popisované v DSM-5). Tento dotazník bol v rámci práce použitý v kapitole 5.

10) Stressful Life events Screening Questionnaire (SLESQ, Goodman et al., 1998) použitý na zisťovanie prežitej traumatickej udalosti obsahuje v pôvodnej verzii 13 položiek. V rámci našej práce bola použitá mierne upravená verzia dotazníka, zahŕňajúca v sebe symptómy podľa DSM-5 (v pôvodnej verzii dotazníka použité údaje z DSM-IV) doplnená o otázky týkajúce sa opakovaného vystavenia sa hrozným detailom traumy a prípadné vystavenie traume skrz elektronické zariadenie (Elhai et al., 2012). Dotazník bol v rámci práce použitý v kapitole 5.

11) Brief Symptom Inventory (Derogatis & Melisaratos, 1983) sleduje výskyt symptómov psychopatológie v období posledných 4 týždňov. Obsahuje 53 položiek hodnotených na 5-stupňovej škále od 1="vôbec nie" po 5="veľmi silne". Celkovo je dotazník zložený z 9 subškál (somatizácia, obsesie a kompulzie, interpersonálna senzitivita, depresia, úzkosť, hostilita, fóbická úzkosť, paranoidné myslenie, psychoticizmus) a rovnako je možné vypočítať skóre celkovej miery závažnosti príznakov (ang. General Severity Index, GSI). Dotazník bol v rámci práce použitý v 7. kapitole.

12) Adaptovaná verzia stresorov spojených s COVID-19 (upravené podľa Lieberoth et al., 2021) obsahuje 20 položiek, ktoré sa zameriavajú na ťažkosti priamo súvisiace s COVID-19, ktoré respondent hodnotí na 7-stupňovej škále, kde 1= „nepociťujem žiadne ťažkosti/obavy" a 7="pociťujem veľké ťažkosti/obavy". V rámci dotazníka sú respondenti/-ky dopytovaní/-é na obavy z príjmov a financií, výkonu v pracovnej/školskej oblasti, prístupu k nevyhnutným výrobkom, pocitov samoty a sociálnych vzťahov, účasti na spoločenských aktivitách a dodržiavaní náboženských/duchovných zvyklostí, fungovaní verejných inštitúcií/zdravotníckeho systému a celkovej ekonomickej krízy v krajine, trávenia voľného a celkových obáv z nákazy (seba alebo blízkych) počas počas korona-krízy. Dotazník bol v rámci práce použitý v 7.kapitole.

2.3 Štatistické analýzy

Analýzy údajov v rámci jednotlivých kapitol boli realizované pomocou softvéru R (kapitola 3, 5, 6, 7, 8) a Jamovi (kapitola 4). Jednotlivé štatistické postupy boli zvolené v súlade s konkrétnymi cieľmi stanovenými v rámci kapitol. Vo všeobecnosti boli v úvode štúdií dáta očistené od respondentov/-iek s nedbanlivými alebo nepravdepodobnými odpoveďovými vzorcami (careless responding). Nasledovala základná deskriptívna štatistika slúžiaca na opis dát a výpočet reliabilty použitých nástrojov, na ktorý sme využívali koeficient omega total. Na výpočet korelácií bol použitý Pearsonov korelačný koeficient a skupiny boli porovnávané pomocou Welchovho t-testu. V rámci validačnej štúdie (kapitola 3) bol využitý výpočet exploračnej a konfirmačnej faktorovej analýzy. Asociácie medzi jednotlivými premennými boli estimované na základe regresných modelov (kapitola 6, 7) a sieťovej analýzy (kapitola 3, 5).

Tabuľka 2.2 Súhrnná tabuľka opisujúca výskumné súbory, použité metódy a štatistické analýzy použité v rámci jednotlivých kapitol

	Výskumná vzorka	Použité metódy	Analýza
Kapitola 3	Reprezentatívna vzorka dospelej populácie Slovenska (N= 1018, 496 mužov z toho 721 ľudí (71%), kt. prežili traumatickú udalosť), priemerný vek = 46,24, SD=16,6	Posttraumatic Growth Inventory (PTGI) Brief Resilience Scale (BRS) Spiritual Well-Being Scale (SWBS) Functional Assessment of Chronic Ilness (FACIT) Life Stressor Checklist (LSC-R)	Exploračná a konfirmačná analýza Sieťová analýza
Kapitola 4	Klinická vzorka ľudí s diagnostikovanou závislosťou od alkoholu (N=34) alebo od iných psychoaktívnych látok (N=17); priemerný vek 45,9 (SD=5,94)	Life Stressor Checklist (LSC-R)	Welchov t-test
Kapitola 5	Klinická vzorka ľudí s diagnostikovanou závislosťou od alkoholu a iných psychoaktívnych látok (N= 74; z toho 69 (93%) prežilo traumatickú udalosť); priemerný vek = 38,45, SD= 10,2 Reprezentatívna vzorka dospelej populácie Slovenska (N=944), priemerný vek = 46,15, SD= 15,82	Brief Resilience Scale (BRS) Checklist PTSD (PCL-5) Life Stressor Checklist (LSC-R) Stressful Live Events Screening Questionnaire	Sieťová analýza
Kapitola 6	Adolescenti/-ky, N= 1786, priemerný vek 16,8, SD=1,2)	COVID Anxiety Scale SF-8 Health Survey BRS ECR-R (verzie pre adolescentov)	Lineárna hierarchická regresná analýza
Kapitola 7	Vysokoškolskí/-é študenti/-ky, N= 2107, priemerný vek = 22,73, SD=3,77)	Brief symptom inventory Adaptovaná verzie stresorov COID BRS	Lineárna hierarhická regresná analýza
Kapitola 8	Reprezentatívna vzorka dospelej populácie Slovenska, N = 1342 až 1949, priemerný vek = 40,77 (SD=14,67)	BRS	Growth curve models

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KAPITOLA 3

Posttraumatic Growth and Its Measurement: A Closer Look at the PTGI's Psychometric Properties and Structure

Bibiána Jozefiaková, Natália Kaščáková, Matúš Adamkovič, Jozef Hašto, Peter Tavel

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Abstract

Despite negative connotations, surviving trauma can result in improvements in some domains of a person's life. This phenomenon is known as posttraumatic growth (PTG), and it is typically measured using the Posttraumatic Growth Inventory (PTGI). Given the ambiguous results of the existing validation studies, the present study aimed to verify the psychometric properties of the Slovak version of the PTGI in a representative sample of Slovak citizens. Although the results suggest that a modified one-factor structure fit the data best, other issues, such as extremely high correlations between the latent factors related to the PTGI's factor structure, were observed. It is likely that the application of the latent variable model does not represent the essence of PTG adequately and the network approach thus appears to be a far more suitable conceptualization of PTG. More detailed information on between-person differences and within-person changes in PTG could help to tailor more effective interventions or preventive programs.

3.1 Introduction

Approximately 70% of people experience at least one potentially traumatic event in their lifetime (Benjet et al., 2016; Knipscheer et al., 2020). Based on the criteria stated in the DSM-5, trauma is defined as an event in which a person is exposed to actual or imminent death, severe injury or sexual violence (American Psychiatric Association, 2013). The word "trauma" is usually perceived negatively, and the majority of research on this topic is focused on its negative consequences on mental health. How a person responds to surviving a traumatic event depends on multiple factors (biological, psychosocial, etc.). PTSD is just one of many possible types of reactions (Yehuda et al., 2015), and it develops in about 5% of people who survive a traumatic event (Atwoli et al., 2015). The prevalence rates stem from a combination of historical circumstances (e.g., war/conflicts, high criminality rates, natural disasters, etc.; see Asnakew et al., 2019) and

the mental health care infrastructure within individual countries, which determines the practices related to PTSD diagnosis and treatment.

After trauma, a prototypical pathway of recovery can be observed. First, an elevation of psychological symptoms with poor functioning for at least several months occurs before they return to baseline, pre-trauma levels. Bonanno (2004) assumes that individuals with a typical recovery trajectory after trauma are most likely to experience and report some positive consequences of the trauma for their lives. Westphal and Bonanno (2007) argue that more resilient people tend not to struggle with some potentially traumatic events to the same extent as might other, more traumatized individuals. There are many controversies between the concepts of PTG and resilience. Hobfoll et al. (2015) implicitly equate posttraumatic growth with resilience or view it as a superior construct covering resilient outcomes. In reaction to this suggestion, Westphal and Bonanno (2007) argue that many if not most people are resilient in the face of trauma and that resilient outcomes typically provide little need or opportunity for PTG. This is supported by a growing number of prospective studies that have demonstrated that many (often the majority of) people exposed to potentially traumatic events exhibit a stable resilient outcome trajectory and are significantly less likely to search for meaning following some loss or potential trauma compared to others exposed to the same event. However, in the last 25 years, research has also started to focus on the positive consequences of surviving a traumatic event. Different terms have been used to describe positive psychological changes after surviving a potentially traumatic event, for instance, positive psychological changes (Yalom and Lieberman, 1991), stress-related growth (Park et al., 1996), flourishing (Ryff and Singer, 1998) or adversarial growth (Joseph, 2009).

The most cited and most elaborated is the theory of posttraumatic growth (PTG; Tedeschi and Calhoun, 1996). PTG is defined as a positive change in certain areas of life as an aftermath of trauma. A positive psychological change can happen in (at least) one of the following domains: (1) interpersonal relationships, (2) new possibilities, (3) personal strength, (4) spiritual change and (5) appreciation of life (Tedeschi and Calhoun, 1996). The phenomenon of PTG has been conceptualized as an outcome of the struggle with a traumatic event or as a coping strategy (Zoellner and Maercker, 2006). PTG has been mostly studied in samples of war veterans (Mark et al., 2018), survivors of a natural disaster (García et al., 2015), victims of sexual violence (Bakaityté et al., 2020), oncological patients or people diagnosed with other serious conditions (Hamama-Raz et

al., 2019). Working with such specific groups could have narrowed the focus of research on traumatic events to the most extreme ones (e.g., war, natural disaster) despite the fact that people experience a wider range of traumatic events throughout their lives (Brooks et al., 2016). According to Kessler et al. (2017), the three most burdensome traumatic events are sexual violence (15.1%), rape (13.1%) and the unexpected death of a loved one (11.9%). Mills et al. (2011) found that the most frequently experienced events among men was having seen someone being badly injured or killed or having unexpectedly seen a dead body; among women it was having had someone close die unexpectedly.

Various research findings have emphasized that the variation of PTG is determined by potentially traumatic/traumatic life events experienced by the person (e.g., Lowe et al., 2020). Some authors have argued that events driven by natural processes (natural disasters or disorders) are related to major posttraumatic growth than those with human interactions, such as sexual violence (e.g., Ickovics et al., 2006; Meyerson et al., 2011). On the other hand, according to some authors (e.g., Ulloa et al., 2016), traumatic events that are related to some kind of sexual violence may lead to growth because of their major effect on the survivors' self-perception and their potential awareness of social themes related to their experience. According to a meta-analysis by Wu et al. (2019), about 53% of people exposed to some form of a traumatic event (chronically ill people, war veterans, firefighters, rescuers, etc.) consequently experience at least medium posttraumatic growth, with women reporting higher scores of PTG than men (e.g., Vishnevsky et al., 2010; Hamama-Raz et al., 2020). However, gender differences in PTG scores seem to depend on the measure used to examine PTG (Barskova and Oesterreich, 2009).

Although researchers from different countries have confirmed that PTG is universal (e.g., Netherlands: Jaarsma et al., 2006; Germany: Mack et al., 2015; China: Xu et al., 2021), some evidence suggests the existence of cultural differences that may be observed in PTG (e.g., Exenberger et al., 2019). The major reason is the fact that different cultures may explain the word "trauma" in different ways and may react to it differently (e.g., Kashyap and Hussain, 2018). These differences may also be attributed also to the differences between individualistic and collectivist cultures (e.g., Kashyap and Hussain, 2018).

With more than 7,000 citations, the Posttraumatic Growth Inventory (PTGI) is the most frequently used method for measuring PTG. The items in the original version of the questionnaire were mainly based on the authors' interviews with people who had severe

physical difficulties or had experienced the death of a loved one (husband/wife), and the questionnaire was validated on a sample of students (Tedeschi and Calhoun, 1996). There are currently three other versions of the original questionnaire: its shortened form (PTGI-SF; Cann et al., 2010), a version for children (PTGI-C; Cryder et al., 2006) and a version with an expanded spiritual-existential change scale (Tedeschi et al., 2017). According to the authors of the original version, the questionnaire consists of five subscales that represent the five PTG domains described above. Besides calculating a score for each subscale, a summary score can be derived (Tedeschi and Calhoun, 1996). The questionnaire has been validated by several research teams from different countries (e.g., Joseph et al., 2004; Jaarsma et al., 2006; Linley et al., 2007; Osei-Bonsu et al., 2012; Mack et al., 2015; Arandia et al., 2018; Silverstein et al., 2018; Xu et al., 2021). The results of these validation studies pointed to inconsistencies in the factor structure of the PTGI questionnaire. While some studies have supported the original five-factor structure of the questionnaire (e.g., Ramos et al., 2016), other authors have observed the best fit for a three-factor structure (e.g., Rodríguez-Rey et al., 2016), a four-factor structure (e.g., Pajón et al., 2020), or structures with multiple latent factors in general (e.g., Osei-Bonsu et al., 2012). Besides the natural variations caused by language/culture adaptation and sampling, the results may differ due to the use of different statistical procedures to verify the factor structure of the PTGI. In practice, however, either the initial five-factor model or the general one-factor structure (i.e., a simple summary score) is widely used (Steffens and Andrykowski, 2015).

Based on the PTG theory described by Tedeschi and Calhoun (1996), spirituality is considered to be the main aspect of PTG. Spirituality has been found to mediate the path between trauma and PTG in parents who have lost their young children (Khursheed and Shahnawaz, 2020). In the study of patients with breast cancer, spirituality predicted higher PTG (Paredes and Pereira, 2017).

Because of (1) the unclear factor structure of the PTGI and (2) the fact that validity of the original version of the measure does not guarantee that its adaptation to other languages will be valid as well (see, e.g. Byrne, 2016), the main aim of this study was to verify the psychometric properties of the Slovak version of the Posttraumatic Growth Inventory (PTGI) on a representative sample of Slovaks. The additional goals of this study were to examine the invariance of the instrument across gender and to examine its relations with external variables (spirituality and resilience) and also with the type of traumatic or stressful event. As spirituality is one of the areas of potential growth, we

expect PTG to be positively correlated with spirituality, and we expect moderate relationships between these two variables (e.g., Paredes and Pereira, 2017; Khursheed and Shahnawaz, 2020). Based on the framework of Westphal and Bonanno (2007) that more resilient people provide little opportunity for PTG, we hypothesized that resilience will be strongly and negatively correlated with PTG (Levine et al., 2009; Ying et al., 2016; Zhang et al., 2019).

3.2 Materials and Methods

3.2.1 Participants and Data Collection

Data was collected in April 2019. Based on quota characteristics (gender, age, education, size of the place of residence, and region of residence), a total of 1018 respondents were selected. Quota characteristics were calculated based on data from the Statistical Office of the Slovak Republic. More descriptive data about the sample are available in Tables 1, 2. Using the Life Stressor Checklist (LSC-R), we identified that 71% (N = 721) of participants in the sample had survived a traumatic or stressful life event. Those participants were then administered the Posttraumatic Growth Inventory (PTGI). The study was approved by the Ethics Committee of the Olomouc University Social Health Institute, Palacky University Olomouc (No. 2019/05).

Table 3.1 Demographic characteristics of the sample.

	N	%
Gender		
Male	496	48,7
Female	522	51,3
Age		
18-24 y.	110	10,8
25-34 y.	187	18,4
35-44 y.	199	19,5
45-54 y.	166	16,3
55-64 y.	168	16,5
65 or more	188	18,5
Living with		
A partner	671	65.9
Alone	162	15,9
Parents	185	18,2
Level of education		
Primary school	137	13,5
Secondary vocational school	272	26,7
High school	382	37,5
University degree	227	22,3

Table 3.2 Prevalence of different types of stressful and traumatic events in the whole sample (N = 1,018).

Stressful/traumatic event	N (%)
Natural disaster (earthquake, hurricane, explosion)	102 (10%)
Serious accident - witness (e.g., car wreck)	209 (20.5%)
Serious accident	53 (5.2%)
Incarceration of a family member	33 (3.2%)
Incarcerated	2 (0.2%)
Own adoption	5 (0.5%)
Separation/ divorce of parents	99 (9.7%)
Own separation/divorce	95 (9.3%)
Financial difficulties (e.g., not enough money for food or place to live)	186 (18.3%)
Serious physical / mental illness (e.g., cancer, heart attack)	62 (6.1%)
Emotional abuse (e.g., frequently shamed, embarrassed, ignored, etc.)	49 (4.8%)
Physical neglect (e.g., not fed, not properly clothed, etc.)	29 (2.8%)
Artificial abortion	29 (5.5% of woman)
Abortion	57 (11% of woman)
Difficult birth	37 (7% of woman)
Separation from own child (e.g., loss of custody or visitation or kidnapping)	7 (0.7%)
Severe physical or mental handicap of a child (e.g., mentally retarded, birth effects etc.)	15 (1.5%)
Caring for a loved one with a disability	72 (7.1%)
Unexpected death of a loved one (e.g., sudden heart attack, murder, suicide)	273 (26.8%)
Death of a loved one	383 (27.6%)
Witness of family violence - before the age of 16 (e.g., hitting, kicking, punching etc.)	69 (6.8%)
Robbery - witness	26 (2.6%)
Have been robbed	26 (2.6%)
Physical abuse before the age of 16 by someone they knew	89 (8.7%)
Physical abuse after the age of 16	25 (2.5%)
Sexual harassment	37 (3.6%)
Sexual touching before the age of 16	9 (0.9%)
Sexual touching after the age of 16	6 (0.6%)
Forced sex before the age of 16	8 (0.8%)

Note: To get a better grip on the prevalence rates of each type of trauma in the general Slovak adult population, the sample in this table is not limited to the participants who experienced a traumatic event.

3.2.2 Measures

Posttraumatic Growth Inventory (PTGI)

The PTGI measures the level of posttraumatic growth in persons who have survived a traumatic event (Tedeschi and Calhoun, 1996). It consists of 21 items, each of

which falls under one of the five factors: (1) relating to others, (2) new opportunities, (3) personal strength, (4) spiritual change and (5) understanding of life. Participants are asked to indicate the degree to which they have or have not experienced a particular change using a scale ranging from 0 to 5. A higher score indicates a higher level of posttraumatic growth. Examples of items: (1) I'm more aware that I can handle difficulties, (2) I'm putting more effort into my relationships or (3) I've found out how great people are. The PTGI does not measure specific changes in behavior, but subjectively evaluated changes in the concept of the world, relationships with other people, and the self. The Slovak version of the PTGI was created by two independent experts in the field of psychotraumatology and one psychologist, then back-translated into English by a licensed translator. All versions were compared and discussed and a consensus on the final version was reached. The reliability of the whole scale (one-factor) was ωtotal = 0.98, while the reliabilities of the subscales ranged from ωtotal = 0.86 to 0.96.

Brief Resilience Scale (BRS)

Resilience was measured using the Brief Resilience Scale (BRS; Smith et al., 2008, the Czech and Slovak validation was done by Furstova et al., 2021). The BRS consists of six items and measures resilience as the ability to recover from a stressful event. Examples of items: (1) It is difficult for me to go through a stressful situation or (2) I tend to recover quickly from difficult situations. The reliability of the scale was ωtotal = 0.87.

Spiritual Well-Being Scale

The Spiritual Well-Being Scale (SWBS; Paloutzian and Ellison, 1982) is a self-report questionnaire that measures spiritual and life well-being. The Slovak version of SWBS was validated by Tavel et al. (2022). The SWBS consists of 20 items, from which either a summary score can be calculated or two subscales (religious well-being and existential well-being) can be derived. In this sample, the scale showed high reliability with ωtotal = 0.87. Examples of items: (1) I don't know who I am, where I came from, or where I'm going or (2) I believe that God is concerned about my problems.

Functional Assessment of Chronic Illness Therapy—Non-illness Version (FACIT-Sp-12)

FACIT is a self-report questionnaire designed to measure spiritual well-being and quality of life. It was initially designed for people diagnosed with serious diseases (Peterman et al., 2002). In our study, its 12-item non-illness version designed for the general (healthy) population (where the word "disease" was changed to the word "difficult time") was used. This version was first validated as a 23-item version, the FACIT-Sp-Ex (Brintz et al., 2017). Four items of the questionnaire focus on the meaning and purpose of life, four items on inner peace, and four items on faith. The reliability of the whole scale is high with $\omega total = 0.88$. Examples of items: (1) I feel peaceful, (2) I have a reason for living or (3) My life lacks meaning and purpose.

Life Stressor Checklist

The prevalence of exposure to life stressors was assessed using the Life Stressor Checklist Revised (Wolfe et al., 1996). The LSC-R is a 30-item questionnaire; 19 items assess events that have a potential for psychological trauma, and nine items focus on other stressful life events. Additional questions provide insights into the age of the person at the time of surviving the event, if survivors experienced intensive fear, helplessness or fear for their life during the event, and how much this situation affects them in later life. The different scores of the LSC-R also comprise the subjective burden of the individual stressor and its impact on the actual life (Kaščáková et al., 2018).

3.2.3 Statistical Analysis

In the initial screening, descriptive statistics were calculated, and the data were screened for missing and improbable values. Given the online administration, the items did not contain any missing values or values that were unlikely to occur (e.g., typos)—all the observed values were within the range of the response scales. As such, no observations were considered as outliers and no transformation of data was applied (note: as a part of the sensitivity analysis, we reproduced the analytic flow after the exclusion of the participants with a Mahalanobis distance > 3 SD and obtained essentially the same results as reported below). The initial screening also included an inspection of the correlation matrix of the PTGI items.

Afterwards, the dataset was randomly split into two parts—an exploratory (NE = 360) and a confirmatory (NC = 361) part. A priori analysis of the statistical power based on the RMSEA coefficient ($\alpha = 0.05$; HA RMSEA = 0.08; H0 RMSEA = 0.04) indicated that for a combination of a sample of N = 360 and a model with df = 179 (the five-factor model), the statistical power to detect the model's misspecification converges to 100%. Although both PTGI models were constructed in accordance with the conventions of PTG research (Tedeschi and Calhoun, 1996; Silverstein et al., 2018), the form of cross-validation used here was preferred, as the occurrence of some misspecifications was expected. The exploratory dataset served to address these misspecifications (all the potential modifications had to be, first and foremost, theoretically justifiable). The confirmatory dataset was hence used to cross-validate the results and to select the most optimal PTGI structure. Consequent invariance testing (with gender as a potential source of invariance) and examination of convergent validity was performed only for the best-fitting model. When examining convergent validity, the external variables (BRS, SWBS, and FACIT) were modeled together in one general model (which, obviously, also included PTGI), and correlations between the latent variables were calculated. From the technical perspective, the models were initially estimated using the WLSMV method, with the items being treated as ordinal. The models were also fitted using the maximum likelihood (ML) estimator due to the technical problems with fitting the five-factor model using the WLSMV (i.e., a Heywood case with a correlation coefficient between the factors exceeding 1; see Results), as well as for the purpose of comparison of competing models using the chi-square difference test. Had the value of chi-square been significant, the models would be considered disconfirmed (note, the chi-square test is the only statistical test of model-data fit in structural equation modeling (SEM); that is, it tests the exact-fit hypothesis that there is no difference between the covariance matrix implied by the model and the matrix of the observed covariances; see Ropovik, 2015; Kline, 2016) been significant. The potential sources of the models' misfit were inspected (factor loadings, covariances between latent factors, residual matrix and modification indices were checked). Apart from calculating chi-square values, the fit of the models was diagnosed using the (scaled) conventional approximate fit indices (AFI), namely, CFI, TLI, RMSEA and SRMR. The satisfactory values, indicating a good local fit of the model, were set to 0.95 for CFI and TLI, 0.06 for RMSEA and 0.08 for SRMR (see Hu and Bentler, 1999). Given the nested structure of the tested models (the expected modified one-factor model), a formal chi-square

difference test was calculated to determine which of the models fit the data best. To examine the reliability of the respective factors, McDonald's omega (utilizing polychoric correlations) was computed.

Post-hoc Analysis

With regard to the problematic (e.g., correlation coefficients between the latent factors equal to or exceeding 1) and hardly interpretable results of the performed confirmatory factor analyses (see Results below), a network analysis was calculated (as an exploratory part of this study) for the whole dataset. The traditional, more or less implicit assumption of a latent variable that causally determines the observed (measured) behaviors is, in fact, only barely justifiable for the conceptualization of psychological constructs (e.g., latent variable models assume causality flowing from the latent variable to the observed indicators, local independence of the indicators after controlling for the latent variable, or that an indicator-level intervention cannot have an effect on the latent variable; see, e.g., Borsboom, 2008; Borsboom and Cramer, 2013; Schmittmann et al., 2013). To the contrary, PTG (or, eventually, any other psychological construct; see e.g., Borsboom and Cramer, 2013) is composed of a set of indicators that are mutually connected and have an inner structure. Instead of assuming the existence of a latent variable, in this approach, the system of causally related variables that "hang" together ultimately represents the construct, overcoming the above-mentioned caveats of traditional latent models. The network approach reveals the structure of a psychological construct by estimating which indicators play a more central/peripheral role and how the indicators are interconnected. Conceptually, this approach can be seen as more realistic compared to other attempts to improve the fit of models (e.g., testing second-order factor models). With respect to the goals of this paper, computing a network of the PTGI items had not been initially intended. Thus, the below-presented network has more of a demonstrative (rather than technically rigorous) purpose. The network was estimated using the EBICglasso estimator (the tuning parameters were set to prefer a sparser network). Centrality/connectivity parameters, as well as indices of network stability and replicability, were calculated. The analyses were performed in R (R Core Team, 2020), with psych (Revelle, 2020), lavaan (Rosseel, 2012), qgraph (Epskamp et al., 2012) and bootnet (Epskamp et al., 2018) serving as the main packages.

3.3 Results

A correlation matrix, as well as means and standard deviations of the PTGI items, is available in Table 3.3.

Table 3.3. Correlation matrix and means and standard deviations of the PTGI items.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	-	.81	.70	.65	.57	.61	.70	.62	.60	.66	.71	.68	.69	.64	.63	.62	.65	.47	.68	.60	.64
2		-	.73	.68	.61	.68	.70	.67	.63	.68	.74	.73	.74	.66	.69	.66	.69	.48	.71	.63	.68
3			-	.76	.55	.64	.76	.65	.62	.65	.69	.67	.65	.70	.64	.64	.66	.44	.65	.63	.64
4				-	.57	.68	.72	.69	.68	.71	.72	.71	.67	.70	.64	.67	.69	.45	.71	.68	.66
5					-	.65	.62	.63	.59	.59	.61	.61	.59	.56	.62	.52	.56	.73	.60	.57	.64
6						-	.67	.76	.68	.71	.72	.73	.68	.66	.70	.66	.67	.51	.67	.71	.74
7							-	.74	.68	.70	.73	.70	.68	.73	.64	.68	.70	.48	.70	.66	.68
8								-	.78	.71	.72	.73	.69	.69	.76	.73	.70	.53	.68	.72	.75
9									-	.72	.70	.70	.67	.67	.70	.73	.70	.50	.67	.67	.71
10										-	.86	.82	.78	.72	.73	.70	.74	.46	.78	.69	.75
11											-	.86	.82	.75	.76	.74	.76	.49	.79	.73	.77
12												-	.81	.73	.74	.72	.76	.49	.77	.72	.77
13													-	.72	.76	.73	.75	.51	.74	.70	.75
14														-	.74	.68	.74	.48	.72	.70	.72
15															-	.73	.75	.55	.72	.73	.81
16																-	.80	.45	.68	.70	.74
17																	-	.49	.75	.73	.78
18																		-	.57	.54	.57
19																			-	.76	.77
20																				-	.84
21																					-
M	2.22	2.54	2.14	2.19	1.91	2.22	2.11	2.09	2.02	2.31	2.41	2.35	2.61	2.02	2.30	2.22	2.15	1.66	2.32	2.21	2.20
SD	1.58	1.58	1.52	1.48	1.54	1.49	1.57	1.45	1.46	1.51	1.54	1.48	1.58	1.55	1.45	1.45	1.48	1.59	1.57	1.50	1.44

Confirmatory Analyses Results

Exploratory Dataset

The original one-factor model ($\chi2(47) = 686.96$; $p < 0.001$), as well as the original five-factor model ($\chi2(48) = 481.55$; $p < 0.001$) showed significant deviations from data. The mean value of the factor loadings was very high—$\lambda = 0.86$ (ranging from 0.68–0.94) for the one-factor model and $\lambda = 0.89$ (ranging from 0.79–0.96) for the five-factor model, respectively. In the one-factor model, there were observed high residual covariances (cov > 0.10) between the items no. 1 and 2, 3 and 4, and 5 and 18. Modification indices (MI > 10) suggested that a covariance term between 14 pairs of the items be included, with the absolute values of the standardized expected parameter change ranging from 0.25 to 0.78. After adding a covariance term between the theoretically justifiable pairs of the items (items no. 5 and 18, 20 and 21, 1 and 2, 10 and 11, 11 and 12, 3 and 4, and 16 and 17), the value of the chi-square statistics dropped substantially. The model was, however, still deemed disconfirmed. Despite showing a much better fit compared to the one-factor model, the five-factor model flagged problems with the convergence – the correlations between the five latent factors were extremely high (the mean correlation was 0.89), and the estimated correlation between factor 2 and factor 3 exceeded the value of 1. The estimation of the model using ML had still produced similar problems with its convergence. Although there were no visible problems with residual covariation in this case, the values of modification indices were erroneous. Due to high collinearity between the factors, the factors correlating above 0.8 were merged, creating a model with two latent factors (items no. 5 and 18 loaded on one factor and all the other items loaded on the second factor). Even though the two-factor model converged, sources of its misspecifications were similar to those observed in the one-factor model. The comparison of the nested model using the likelihood ratio test showed that, out of the candidate models, the five-factor model fit the data best. When compared with the non-nested modified one-factor model (probabilistic model selection), the five-factor model showed worse values of information criteria AIC and BIC. The parameters of models' fit are summarized in Table 4. The reliabilities of the respective subscales (both in the one-factor the two-factor and the five-factor model) were extremely high ωTotal = 0.90–0.98, except for the reliability of the fourth factor in the five-factor model, which was still very high (ωTotal 0.86).

Table 3.4 Model fit parameters (scaled) for both the exploratory and the confirmatory dataset.

Model	χ^2	df	p	CFI	TLI	RMSEA [95% CI]	SRMR
Exploratory dataset							
One-factor	686.96	47	< .001	.87	.99	.20 [.18, .21]	.04
Five-factor	481.55	48	< .001	.91	.99	.16 [.15, .17]	.03
Modified One-factor	381.62	50	< .001	.93	.99	.14 [.12, .15]	.03
Two-factor	603.53	47	< .001	.89	.99	.18 [.17, .19]	.04
Confirmatory dataset							
One-factor	713.25	37	< .001	.87	.98	.23 [.21, .24]	.05
Five-factor	438.70	37	< .001	.92	.99	.17 [.16, .19]	.04
Mod. One-factor	379.60	38	< .001	.94	.99	.16 [.15, .17]	.04
Two-factor	536.81	37	< .001	.91	.99	.19 [.18, .21]	.04

Confirmatory Dataset

All the models tested in the exploratory dataset were fitted again in the confirmatory dataset. Similar to the previous results, the five-factor model had troubles with convergence regardless of the estimation method, as there was extremely high collinearity between the latent factors. Given that the modified one-factor model had fit the data best, it was used for further analysis of convergent validity and measurement invariance across gender. The fit parameters for all the models are presented in Table 3.

Assuming potential gender differences in the PTGI structure, measurement invariance was calculated on the modified one-factor model. The results indicate that the PTGI structure is invariant across gender in term of metric ($\Delta\chi2 = 20.92$, $\Delta df = 20$, $p = 0.402$) and scalar ($\Delta\chi2 = 28.34$, $\Delta df = 20$, $p = 0.102$) invariance. Significant non-invariance was observed in terms of the latent means of PTG ($\Delta\chi2 = 10.12$, $\Delta df = 1$, $p = 0.001$), with women scoring 0.35 SD (converted to the PTGI scale = 9.1 points) higher than men.

The modified one-factor model was then correlated with the BRS ($r = -0.05$), SWBS ($r = 0.29$) and FACIT ($r = 0.32$) within one general model. The reported

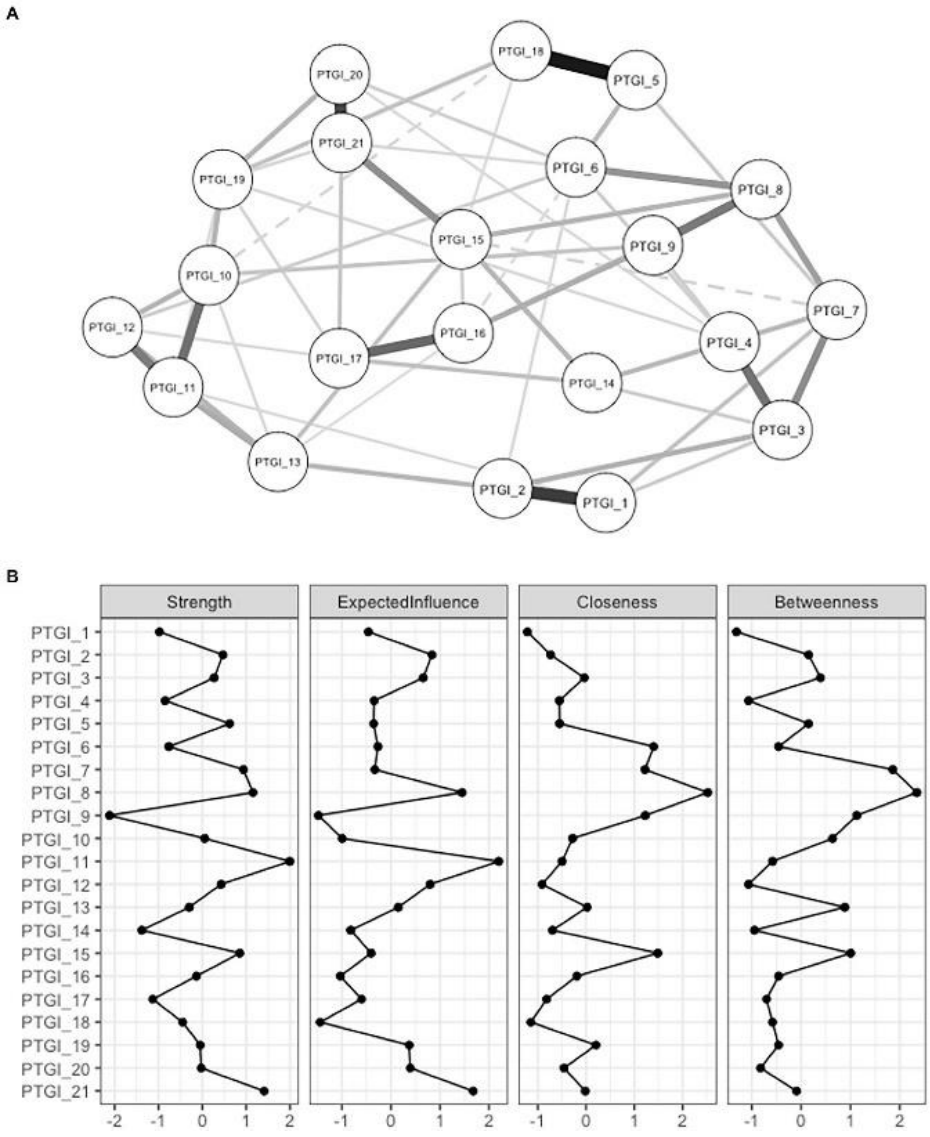
coefficients thus represent correlations between the latent variables. It is worth noting that item no. 18, which describes religious faith, showed very high cross-loadings on both the SWBS and FACIT. For descriptive purposes, the one-factor model was correlated with the Life Stressor Checklist (LSC-R), which serves as a screening for stressful (traumatic) experiences. The results of the LSC-R were then divided into five scores: (1) interpersonal violence, (2) indirect trauma, (3) traumatic events experienced before 16 years old, (4) a summary score of traumatic exposure and (5) other forms of trauma (see Schumacher et al., 2010; Kaščáková et al., 2018). The observed correlations between the PTGI score and the above-described scores were $r = 0.10$, $r = 0.22$, $r = 0.15$, $r = 0.22$, and $r = 0.23$ for interpersonal violence, indirect trauma, traumatic events experienced before 16 years old, summary score of traumatic exposure and other forms of trauma, respectively. When assessing individual events, the strongest correlations were found between the PTGI score and being directly involved in or a witness to an accident ($r = 0.33$; $r = 0.18$), taking care of a long-term sick relative ($r = 0.31$), and an unexpected death or the death of loved ones ($r = 0.26$; $r = 0.29$).

PTG as a Network

The performed analyses point to five main conclusions: (1) there was a strong correlation (average $r = 0.68$) between the PTGI items; (2) all the PTGI items loaded very well on the latent factor/factors; (3) if PTGI was modeled with more than one latent factor, there were extremely high correlations between the factors; (4) the modified one-factor model fit the data best; and (5) none of the PTGI items was problematic per se. The combination of these facts suggests that it is next to impossible to find an optimal factor structure for the PTGI (note: this assumes that all the PTGI items are important for the operationalization of PTG—in other words, the items in PTGI capture all the theoretically relevant aspects of PTG). It is therefore possible that the inability to find an optimal factor structure stems from the way PTG is statistically modeled in validation studies, including this one. Applying reflective latent models to psychological constructs rests on several assumptions which are usually not tenable. For example, in reality, it is unlikely that an underlying latent variable (or, say, five latent variables) exists representing PTG that causes its observable indicators. Rather on the contrary, mutual relationships between the specific behavioral aspects (indicators) and their dynamics cause a system which is conventionally labeled as PTG. This radical shift in the perspective and understanding of a phenomenon (from latent models to a network approach) subsequently changes the

nature of the research questions being asked; for instance: (1) how are the indicators of PTG related? (2) Which PTG indicators play a core, or on the other hand, a peripheral role in the system? To provide insight into these emerging questions, a network consisting of PTG indicators was estimated. A visualization of this (conservative—small edges were shrunk to zero) network is presented in Figure 1A.

Figure 3.1. Visualization of a network of the PTGI's items and their centrality indices.



As can be seen from Figure 1B, the highest degree of centrality (strength of a direct association between an indicator and other indicators; strength and expected influence) was found for items no. 11, 21 and 8. The highest connectivity, in terms of how strongly a node is indirectly connected with other nodes (closeness), was found for items no. 8, 6, 7, 9 and 15, while items no. 7 and 8 were the most important for connecting other nodes (betweenness).

The estimated network is relatively robust. Bootstrapped estimates suggest that the above-described parameters are rather stable, although the stability is not ideal (for all the parameters, the point estimate of average correlation with the original sample is above $r = 0.50$ even when 50% of cases are dropped).1 The presented network is also fairly replicable. Estimates obtained from replicating and simulating the network highly correlate ($r \approx 0.70$ and higher) with the original values (except for Jaccard index), even when 250 cases are sampled. Altogether, the network performs well enough to make some initial inferences; nonetheless, future replication studies are very much needed.

3.4 Discussion

The aim of this study was to verify the factor structure of the Slovak version of the Posttraumatic Growth Inventory (PTGI) on a representative sample of the Slovak population. The analyses revealed strong correlations between the PTGI items and also extremely strong correlations between the latent factors (had the PTG model included more than one latent factor). The results suggested that a modified one-factor model overperformed the competing models. While the structure of the one-factor model was invariant across gender, a difference in the latent means was observed (women scored higher compared to men). The questionnaire is thus applicable to both men and women (Mordeno et al., 2015). The convergent validity of the modified one-factor model of the PTGI was examined by correlating the factor with the external criteria spirituality (FACIT-Sp-12 non-illness, SWBS) and resilience (BRS). A weak to moderate positive relationship with spirituality and a weak negative relationship with resilience were observed. Similar findings were found in other studies (Shaw et al., 2005; Danhauer et al., 2013; Paredes and Pereira, 2017).

Although the modified one-factor model fit the data best, altogether, the observed results (e.g., even the best-fitting model significantly deviated from the data; very high correlations between the items; extremely high correlations between the PTGI subscales, if the model consists of more than one latent factor) suggest that the main issue may lie elsewhere. Given the observed results, but also the conceptual basis for measuring psychological constructs, applying the latent variable model (a latent factor is a single cause of the observed/reported indicators) to PTG might not be appropriate. Instead, a network approach, in which PTG is regarded as a set of mutually interacting indicators that form a structure consensually labeled as PTG, is a more appropriate representation (for similar argumentation in PTSD research, see Armour et al., 2017).

The existing evidence (e.g., Silverstein et al., 2018), as well as the present results (high correlations between latent factors), suggest that although posttraumatic growth as a construct can be observed in different domains of life (Tedeschi and Calhoun, 1996), it is probably the same variable. Dividing the PTGI into factors could potentially help to better capture the nature of this phenomenon from the theoretical perspective. The empirical evidence, however, suggests that this distinction is rather didactical. If a researcher aims to study PTG, a reduction in the number of administered items (e.g., administering a short form of the PTGI, see Cann et al., 2010; Lamela et al., 2014) could save resources as well as the participants' time and effort, subsequently leading to a higher quality of the obtained data. Therefore, if an item is not essential with respect to the constitutive definition of PTG, removing it from the measure might be worth consideration. In other words, it might be useful to take a step back and look at the constitutive definition of PTG and utilize the corresponding operationalizations in the questionnaire.

Shifting the perspective from a latent variable model to the more structured network approach would allow detecting the central/peripheral indicators. The indicators showing high centrality indices are theorized to be good intervention targets, as they are the most closely related to all the other indicators in the network and, as such, are more likely to influence the development of the other indicators within the network (e.g., Levinson et al., 2018). On the other hand, indicators that are low on centrality/connectivity indices are less likely to be influential for the network. Identification of the roles of the variables forming a construct helps to design interventions/facilitation strategies. For dynamic systems, tailoring interventions solely from cross-sectional data could be tricky (see Rodebaugh et al., 2018; Henry et al., 2020) and more longitudinal research and studies that use experience sampling will be needed. Based on the performed calculations, items no. 6, 7, 8, 9, 11, 15 and 21 appear to be the most central ones. These items correspond to the first (relating to others) and the second (new possibilities) factor from the original five-factor structure. Based on this, we can consider the quality of relationships and the social environment a person has, how they are able to communicate their difficulties and how their view of life and confidence in their own coping skills will changeto be the most important for posttraumatic growth. Bellet et al. (2018) have already examined a network structure of PTG. They, however, used the short form of the PTGI (PTGI-SF) and were primarily focusing on the co-occurrence of PTG and complicated grief. According to their findings, the core indicators

(based on the expected influence measure) of PTG were the items no. 6 and 9 (corresponding to items no. 7 and 19 in the original, full version of the PTGI questionnaire). These items fall under the new possibilities (II) and personal strength (III) factors. Contrary to the present analysis, the authors did not find sufficient evidence for depicting the relating to others (I) factor as a core aspect of PTG. They highlight the importance of the ability to imagine a new way forward and, at the same time, their results suggest that greater personal strength might be more important for PTG than relationships with others. The least influential items appeared to be the items no. 1 ("My priorities about what is important in life") and 2 ("An appreciation for the value of my life"), which partially corresponds with the findings from the presented analysis. According to Peters et al. (2021), who also examined the structure of the PTGI (Chinese adaptation, short version), the most central nodes were finding a new path in life, a greater sense of closeness with others, and the ability to do better things with life. In the network presented by those authors, the changing priorities item was very peripheral.

Based on the results of invariance testing, women had a higher average PTG score, which may be related to their higher emotionality and openness to communicate their own experiences (First et al., 2017). Another possible explanation is that women cope with the situation using more deliberative and reflective rumination, which might lead to higher posttraumatic growth (Vishnevsky et al., 2010). In general, emotion-focused coping strategies (positive reaction, acceptance, denial) are positively related to PTG (Butler et al., 2005; Helgeson et al., 2006; Prati and Pietrantoni, 2009).

Positive moderate correlations were observed between spirituality and posttraumatic growth. This result is in line with the theory of posttraumatic growth process as described by Tedeschi and Calhoun (1996) that spiritual change is one of the main aspects of PTG and is also supported by other studies (e.g., Prati and Pietrantoni, 2009).

Furthermore, weak positive correlations were observed between PTG and the scores of stressful events, as measured by the Life Stressor Checklist. As for individual types of stressors, weak to moderate correlations were found between PTGI score and the care for long-term sick loved ones, the (unexpected) death of loved ones and to be an accident witness or participant. Karanci et al. (2012) found that the type of event had a significant impact on only two domains of PTGI, namely the appreciation of life and the relating to others, e.g. an accident was more strongly correlated with the appreciation of life than with relating to others, and the unexpected death of a close person was strongly

correlated with relating to others. Regarding trauma types, it seems that individuals who experienced interpersonal trauma (such as physical or sexual assaults) have more posttraumatic symptoms than those who experienced non-personal trauma (such as an accident or disaster), but no significant difference in PTG was found or there were only some variations in specific domains of PTG (Lowe et al., 2020; Thomas et al., 2021). We think that clinicians could benefit both from assessing posttraumatic stress symptoms (PTS) and signs of growth after trauma in their patients. Both PTS and PTG can be present and coexist; in such cases, PTG can be viewed more as an indicator of coping with PTS than as actual growth (Zoellner and Maercker, 2006; Thomas et al., 2021).

A weak negative correlation was observed between PTG and resilience. The evidence on this topic is inconsistent. While some authors found a positive relationship between these two variables (Bensimon, 2012), others detected a negative relationship (Levine et al., 2009). The inverse correlation between resilience and PTG could be explained by the fact that a more resilient person may not cognitively evaluate (cognitive processing plays a key role in PTG development; Tedeschi and Calhoun, 1996) a traumatic event as sufficiently threatening or disruptive and, as such, PTG may not develop (Levine et al., 2009). This is also in line with the suggestion of Westphal and Bonanno (2007) that resilient outcomes typically provide little need or opportunity for PTG. The results may also vary for a very pragmatic reason—the fact that different operationalizations of a construct could lead to different findings (see, e.g., Bensimon, 2012; Adamkovič et al., 2020).

Although we did not focus on the relationship between PTS and PTG in this study, this is a valuable topic, mainly from the therapeutic point of view. Studies have shown that there is a curvilinear relationship between PTS/PTSD and PTG, supporting the opinion that there cannot be PTG without some level of PTS (Sanki and O'Connor, 2021). The affective-cognitive processing model of PTG developed for mental health professionals takes the approach that PTS is a normal response to trauma and works with cognitions, appraisals, intrusions and emotional state and coping behaviors, until a reconciliation of pre- and post-assumptive worldview is completed (Joseph et al., 2012). The priority is to simply be present and non-judgmental and rather to support deliberative rumination to develop an individual pathway for PTG.

Psychotherapy constitutes a good context to explore positive changes in the aftermath of trauma. The simultaneous acknowledgement of patients' suffering in a trustful and intimate therapeutic relationship enables them to explore positive changes as

a result of their coping process. However, Zoellner and Maercker (2006) recall that the absence of growth should not be regarded as a failure, because PTG is not necessary for successful recovery from traumatic events.

Limits and Perspectives of Further Research

The present study has several limitations. The first one regards the research sample. As the data comes from a representative sample of the adult Slovak population, the generalizability of the results to other cultural settings might be, obviously, limited. With regard to the representativeness of the sample, the participants are heterogeneous in terms of trauma profiles. Further research is needed to examine in detail the potential effect of the type of traumatic event on the structure of PTG. Second, the study was not focused on discussing the theoretical justification of the constitutive definition of PTG nor was it focused on qualitative analysis of items operationalization. Third, even though the study also presented a network analysis of PTG, it is important to acknowledge that this was not the original purpose of the study (the main aim of the study was to verify the psychometric properties and the factor structure of the PTGI) and, as such, the network presented herein has rather a demonstrative character. To learn more about the structure of PTG from a network perspective, more exclusive research on this topic would be needed. Ideally, such research would combine cross-sectional, longitudinal and experiential sampling design, while putting sufficient effort into having the study designs reasonably powered. The combination of between-person differences and within-person changes could help determine which aspects of PTG are more efficient to address by potential interventions or prevention programs. The present evidence, although based on cross-sectional data, suggests that intervening in one's social relationships, self-confidence and communication training could promote PTG. Having a succinct PTG measure with a clear structure that produces a valid score across different cultures is, therefore, a necessity.

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KAPITOLA 4

STRESUJÚCE A TRAUMATICKÉ ŽIVOTNÉ UDALOSTI PREŽÍVANÉ U ĽUDÍ SO SYNDRÓMOM ZÁVISLOSTI

B. Jozefiaková, N. Kaščáková, J. Hašto, I. Dušeková, Z. Šalingová, M. Plichtová, Z. Farbulová, L. Pavelková, P. Rozinajová

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Súhrn

Úvod: Výskyt porúch užívania látok a závislostí od látok je v SR pomerne častý, podobne aj v iných krajinách Európy. Závislosťou trpia približne 2% celkovej populácie. Prevalencia traumatických udalostí v bežnej populácii je tiež častá, v skupine ľudí s poruchou užívania látok je ale ešte významne častejšia. Vzhľadom na častejší výskyt tráum v životoch týchto ľudí, sú aj skupinou, pri ktorej je častejší rozvoj posttraumatickej stresovej poruchy (PTSP). Neliečená a nespracovaná trauma a rozvinutá PTSP môže výrazne narušiť liečbu samotnej poruchy užívania látok alebo závislosti a znížiť jej efektivitu. Vzhľadom na to bolo hlavným cieľom práce zistiť, či sa ľudia s diagnostikovaným syndrómom závislosti (od alkoholu a iných psychoaktívnych látok) líšia v častosti zažívania stresujúcich a traumatických udalostí od bežnej populácie Slovenska.

Metódy: Výskumnú vzorku tvorilo 51 ľudí (dg F10 – N=34; dg F11-F19 – N=17) v rámci ktorej bolo 38 mužov a 13 žien. Využitý bol Dotazník životných stresorov (LSC–R), pričom sme ľudí so syndrómom závislosti porovnávali s reprezentatívnou vzorkou dospelej populácie Slovenska (N=1018) v niekoľkých ukazovateľoch: (1) sumárne skóre životných stresorov, (2) skóre interpersonálneho násilia, (3) skóre prežitých traumatických zážitkov do 16 rokov a (4) skóre traumatickej záťaže.

Výsledky: Na základe výsledkov môžeme povedať, že ľudia so syndrómom závislosti dosahovali vo všetkých štyroch sledovaných skóre signifikantne vyššie výsledky. Medzi skupinou ľudí so závislosťou od alkoholu (N=34) a od iných psychoaktívnych látok (N=17) sme nepozorovali signifikantné rozdiely.

Záver: Ľudia so závislosťou prežívajú v porovnaní s bežnou populáciou signifikantne viac stresujúcich udalostí, vrátane včasného stresu prežívaného do 16 roku života.

Dosahujú tiež významne vyššie hodnoty v rámci celkovej traumatickej záťaže, čo by mohlo byť spojené spolu s včasnou traumatizáciou aj so zvýšeným rizikom rozvoja posttraumatickej stresovej poruchy (PTSP). Podľa dostupných údajov z výskumov sa PTSP u ľudí s poruchou užívania látok vyskytuje približne 3x viac než u kontrol. V bežnom klinickom posúdení pacienta so závislosťou často diagnóza PTSP uniká pozornosti.

Kľúčové slová: psychická trauma, PTSP, posttraumatická stresová porucha, stresujúce udalosti, syndróm závislosti

4.1 Úvod

Celkovo trpia závislosťou od alkoholu a iných psychoaktívnych látok približne 2% svetovej populácie, pričom sú do štatistiky započítané aj zeme, kde je alkohol tabuizovaný z náboženských dôvodov (Ritchie a Roser, 2019). Jednotlivé krajiny sa líšia v podiele závislých, ale aj v tom, ktorá z látkových závislostí dominuje. Podľa prehľadovej správy Svetovej zdravotníckej organizácie o alkohole a zdraví v roku 2016 (World Health Organization, 2018) v európskom regióne pije alkohol 59,9 % obyvateľstva, pričom na hlavu celkového obyvateľstva (15r.+) pripadá ročne 9,8 litra čistého alkoholu. V SR to bolo 11,5 litra. Pre porovnanie v ČR 14,4 litra. Pre SR bola odhadnutá 12- mesačná prevalencia poruchy užívania alkoholu na 12,2 % (22,8 % muži, 2,5 % ženy), pričom európsky priemer je 8,8 %. Závislosť od alkoholu bola odhadnutá na 5,5 % (10,2 % muži, 1,1 % ženy), európsky priemer je 3,7 %. Prevalencia ťažkého epizodického pitia bola až 36,2 %, definovaná ako viac než 60g čistého alkoholu v posledných 30 dňoch. Použitie diagnostickej kategórie „porucha užívania alkoholu“ vychádza z DSM-5 uvedenej v r. 2013 a jej vymedzenie je širšie než „závislosť od alkoholu“ (Americká psychiatrická asociácia, 2018). Podľa Európskej drogovej správy za rok 2020 (European Drug Report; European Monitoring Centre for Drugs and Drug Addiction, 2020) vyskúšalo ilegálnu drogu za svoj život približne 96 miliónov ľudí vo veku 15-64 rokov, čo je 29% celkovej dospelej populácie. Vo všeobecnosti platí, že najčastejšie skúšaná a užívaná droga je cannabis, ktorú za svoj život aspoň raz vyskúšalo 54,6 miliónov mužov a 35,7 miliónov žien. V rámci Európy sa počet užívateľov cannabisu odhaduje na 5,45% celkovej dospelej populácie (rok 2019). Podľa Svetovej správy o drogách za rok 2021 (World Drug Report; United Nations : Office on Drugs and Crime, 2021) trpí závislosťou od psychoaktívnych látok celosvetovo približne 35

miliónov ľudí vo veku 15-64 rokov. Stále nie je jasné, aký dopad bude mať na túto skupinu obyvateľstva pandémia COVID-19. Predpokladá sa však, že reštriktívne opatrenia a ekonomická situácia môžu ešte viac ohroziť najchudobnejšie vrstvy obyvateľstva, ktoré sú najzraniteľnejšie na rozvoj závislostí (World Drug Report, 2020).

Okrem iných psychologických a sociálnych premenných je významným rizikovým faktorom rozvoja závislosti aj prežitá traumatická udalosť (Konkolÿ a kol., 2017). Podľa DSM-5 (APA, 2018) je pri diagnostickej kategórii „posttraumatická stresová porucha“ a zhodne aj pri „akútna stresová porucha“ definovaná traumatická udalosť ako „vystavenie skutočnej alebo hroziacej smrti, vážnemu zraneniu alebo sexuálnemu násiliu jedným (alebo viacerými) nasledujúcimi spôsobmi: 1. Priame prežitie traumatickej udalosti/traumatických udalostí. 2. Osobné svedectvo udalosti/udalostí, ktoré sa stali iným. 3. Dozvedieť sa, že sa traumatická udalosť/udalosti sa stali blízkemu rodinnému príslušníkovi alebo blízkemu priateľovi. V prípadoch skutočnej alebo hroziacej smrti člena rodiny alebo priateľa sa musí jednať o násilnú udalosť alebo nehodu. 4. Zážitok opakovaného alebo extrémneho vystavenia nepríjemným detailom traumatickej udalosti (napr. záchranári zbierajúci ľudské pozostatky, policajti, ktorí sú opakovane vystavovaní detailom o týraní/zneužívaní detí).“

Zatiaľ čo prevalencia prežitých traumatických udalostí v reprezentatívnych vzorkách bežnej populácie z 24 rôznych krajín je v priemere približne 70 %, s rozptylom medzi krajinami 45,9 % - 97,2 %, pričom autori použili CIDI- The Composite International Diagnostic Interview, ktorého súčasťou je 27 typov traumatických udalostí (Benjet a kol., 2016), v skupine ľudí s poruchou užívania látok zistili holandskí autori expozíciu traume u 97,4 % a výskyt PTSP u 36,6 % , pričom v kontrolnej skupine to bolo 11,8 % (Gielen a kol., 2012). Traumatickú udalosť tak zažije teda takmer každý jeden človek s poruchou užívania látok, čo tiež významne zvyšuje riziko rozvoja posttraumatickej stresovej poruchy (PTSP), ale aj iných klinických syndrómov (napr. adaptačné, depresívne, úzkostné, somatoformné, disociatívne poruchy, abusus psychotropných látok, poruchy alebo zmeny osobnosti) (Maercker, 2020; Tagay a kol, 2011). Prevalencia PTSP je u skupiny ľudí **s** poruchou užívania látok približne 3-krát vyššia ako v kontrolných skupinách (Gielen a kol., 2012; McCaule a kol., 2013). Ak sa v anamnéze pacienta objaví zážitok traumy a prípadne aj rozvinutej a neliečenej posttraumatickej stresovej poruchy, môže to zhoršiť odpoveď pacienta na liečbu a tiež skracovať obdobie abstinencie po liečbe (Roberts a kol., 2015; Schafer a Najavits, 2007). Vysvetlenia tejto pomerne častej komorbidity sú rôzne. Na jednej strane sa súvislosť

medzi PTSP a poruchou užívania látok vysvetľuje tým, že ľudia, ktorí zneužívajú alkohol a psychoaktívne látky sú zároveň zraniteľnejší na rôzne formy násilia a môžu sa častejšie dostávať do situácií násilia (Castillo – Carniglia a kol., 2019). Na strane druhej sa môže uplatňovať aj súvislosť, že človek, ktorý zažil traumatickú udalosť, sa snaží „otupiť" príznaky PTSP (napr. vnucujúce sa, nechcené spomienky na traumu, flasbacky, pretrvávajúci negatívny emočný stav, neschopnosť prežívať pozitívne emócie) alkoholom alebo inou psychoaktívnou látkou, čím sa prirodzene zvyšuje riziko rozvoja závislosti (Roberts a kol., 2015). „Syndróm závislosti" (F1x.2 podľa ICD-10, WHO, 1991), resp. „porucha užívania látok" podľa novej terminológie DSM 5, a PTSP majú tiež niekoľko spoločných rizikových faktorov ako je napríklad (1) depresívna epizóda v anamnéze (Debell a kol., 2014; McCarthy a Petrakis, 2010), (2) prítomnosť iných psychiatrických diagnóz (Debell a kol., 2014;), ale aj (3) stresujúce udalosti prežité pred 18-tym rokom života (Gilpin a Weiner, 2016; Lee, Oswald a Wand, 2018).

Cieľom tejto práce bolo zistiť či sa ľudia so syndrómom závislosti (od alkoholu a iných psychoaktívnych) líšia vo výskyte a intenzite zažívania stresujúcich a traumatických zážitkov v porovnaní s bežnou populáciou Slovenska. Zaujímalo nás tiež, či existuje rozdiel vo výskyte a intenzite zažívania týchto udalosti medzi ľuďmi so závislosťou od alkoholu a iných psychoaktívnych látok.

4.2 Metódy

Štúdie sa zúčastnilo celkovo 51 ľudí s diagnostikovanou závislosťou od alkoholu (N=34) alebo od iných psychoaktívnych látok (N=17), ktorí boli aktuálne hospitalizovaní na oddelení špecializovanom na liečbu závislostí. Priemerný vek bol 45,9 roka (SD= 5,94). Vo výskumnej vzorke bolo celkovo 38 mužov a 13 žien. Účasť pacientov na výskume bola dobrovoľná, každý z nich bol oboznámený s jeho účelom a podpísal informovaný súhlas. Dáta zbierali psychiatri a psychológovia KDZ formou osobného štruktúrovaného rozhovoru s elektronickým zaznamenávaním odpovedí (CAPI = Computer – assisted personal interviewing) (Sainsbury, Ditch, a Hutton, 1993), ktoré boli odosielané pod špecifickým kódom a teda anonymizované. Štúdia bola schválená Etickou komisiou nemocnice dňa 29.9.2020 (PAP-20). Samotný zber dát na KDZ bol v mesiacoch september-december 2020. Výsledky boli porovnávané s reprezentatívnou vzorkou dospelej populácie Slovenska (N=1018, priemerný vek = 46,24 roka, SD = 16,56), zber ktorej sa uskutočnil v apríli 2019 v rámci projektu: Traumatizácia v detstve a zdravie v dospelosti (Kaščáková a kol., 2020), schváleného Etickou komisiou Univerzity

Palackého v Olomouci dňa 25.3.2019 (5/2019). Reprezentatívnosť súboru určovali kvótne znaky, stanovené na základe údajov zo Štatistického úradu Slovenskej republiky o štruktúre dospelej populácie Slovenska s ohľadom na rod, vek, vzdelanie, národnosť, veľkosť sídla a región. Aj v tomto prípade bola účasť na výskume dobrovoľná, dáta boli anonymizované a účastníci boli v rámci informovaného súhlasu oboznámení s tým, že svoju účasť môžu kedykoľvek ukončiť. Zber v reprezentatívnej vzorke obyvateľov SR robili vyškolení administrátori metódou CAPI, teda rovnako ako v klinickej vzorke. Ďalšie deskriptívne údaje o vzorke, vrátane komorbídnych psychiatrických diagnóz určených psychiatrami priamo na oddelení nemocnice podľa diagnostických kritérií MKCH-10 (Smolík, 2002), sú prezentované v Tabuľke č. 1 a č. 2. Najčastejšie, až v 33,3 % sa vyskytovala komorbídne zmiešaná porucha osobnosti (F 61) a v spolu 17,7 % sa vyskytovali diagnózy zo spektra afektívnych porúch (F 31-38). V klinickom súbore nemal nikto z pacientov diagnostikovanú PTSP ani reakciu na ťažký stres alebo adaptačnú poruchu.

Tabuľka 4.1 Údaje o najvyššom dosiahnutom vzdelaní respondentov (N=51)

	N	%
Základné vzdelanie	4	7,8
Stredoškolské bez maturity	18	35,3
Stredoškolské s maturitou	24	47,1
Vysokoškolské	5	9,8

Tabuľka 4.2 Diagnostikované komorbídne diagnózy v rámci vzorky (N=51)

	N	%
F 06	1	2,0
F 07	1	2,0
F 10	34	66,7
F 13	2	5,3
F 15	1	2,0
F 19	18	35,3
F 23	1	2,0
F 31	1	2,0
F 32	4	7,8
F 33	1	2,0
F 38	3	5,9
F 41	2	3,9
F 50	1	2,0
F 60	2	3,9
F 61	17	33,3
F 63	5	9,8
F 64	1	2,0
F 90	1	2,0

V rámci štúdie sme pracovali s Dotazníkom životných stresorov (Life Stressor Checklist – Revised – LSC-R) (Wolfe a kol., 1999). Ide o 30-položkový dotazník, ktorý obsahuje 19 otázok popisujúcich situácie, ktoré podliehajú definícii traumy, 9 otázok, ktoré opisujú ďalšie záťažové situácie a 2 doplnkové otvorené otázky. Keďže dotazník zisťuje aj vek, v ktorom sa traumatizujúce resp. stresujúce udalosti v živote človeka objavili, je možné stanoviť skóre udalostí, ktoré sa vyskytli pred 16tym rokom života. Otázky na udalosti s traumatickým potenciálom obsahujú aj doplňujúce podotázky, ktoré sa zameriavajú na prežívanie strachu a hrôzy a tiež na presah prežitej udalosti do súčasnosti. Na základe týchto otázok je možné stanoviť rôzne skóre. V rámci našej štúdie sme pracovali so (1) sumárnym skóre životných stresorov, ktoré vznikne zrátaním všetkých pozitívnych odpovedí, (2) skóre interpersonálneho násilia, do ktorého spadajú situácie fyzického a psychického týrania, zanedbávania a sexuálneho zneužívania, (3) skóre životných stresorov pred 16-tym rokom života a (4) skóre traumatickej záťaže, ktoré vzniká zrátaním tých udalostí, pri ktorých ľudia zažívali intenzívne pocity bezmocnosti a strachu a teda, spĺňajú kritériá traumy podľa DSM-IV (bližší prehľad v Kaščáková a kol., 2018). Všetky prežité stresujúce a traumatické zážitky, ktoré sa vo výskumnej vzorke objavili prezentujeme v Tabuľke 4.3.

Všetky štatistické analýzy bola robené v programe Jamovi. Použili sme metódy deskriptívnej štatistiky. Na zisťovanie rozdielov medzi skupinami bol využívaný Welchov t-test. Pri sledovaní výsledkov sme sa okrem p-hodnôt zameriavali aj na sledovanie veľkostí efektov (Cohenovo d).

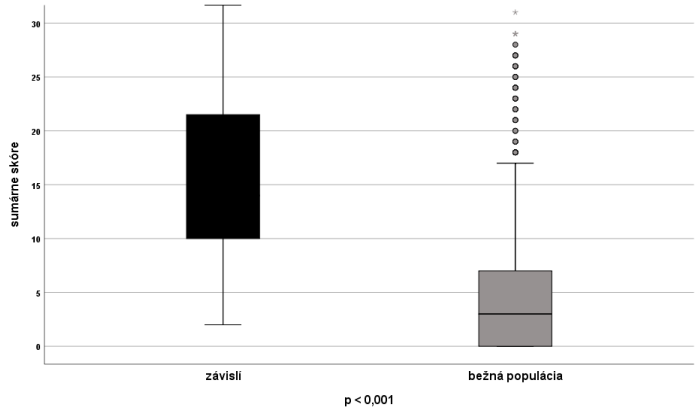
4.3 Výsledky

Skupina ľudí so závislosťou (N=51) sa od skupiny reprezentujúcej bežnú dospelú populáciu obyvateľov Slovenska signifikantne líšila vo všetkých sledovaných skóre Dotazníka životných stresorov (sumárne skóre; skóre interpersonálneho násilia; životné stresory pred 16-tym rokom života; traumatická záťaž). Presné výsledky sú zobrazené v grafoch 4.1, 4.2, 4.3 a 4.4.

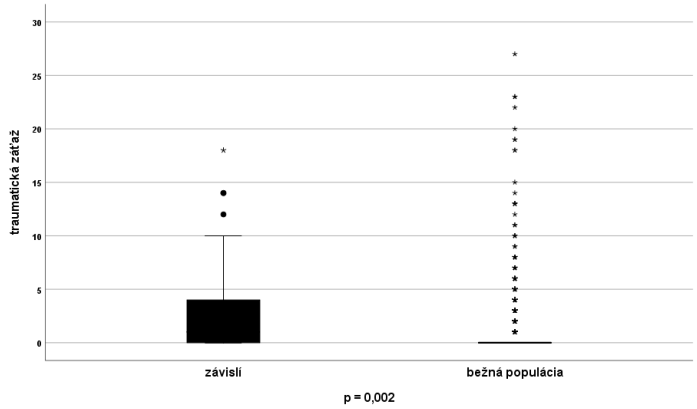
Tabuľka 4.3 Zažité stresujúce a traumatické udalosti podľa LSC-R v rámci celkovej skupiny (N=51), v skupine ľudí so závislosťou od alkoholu (N=34) a v skupine ľudí so závislosťou od iných psychoaktívnych látok (N=17)

	Ľudia so závislosťou od alkoholu		Ľudia so závislosťou od iných psychoaktívnych látok		Celkovo	
	N	%	N	%	N	%
Živelná katastrofa	16	47	5	29,4	21	41,2
Svedok vážnej nehody	22	64,7	11	64,7	33	64,7
Vážna nehoda	11	32,4	5	29,4	16	31,4
Blízky vo väzení	3	8,8	3	17,6	6	11,8
Vlastné väzenie	6	17,6	6	35,3	12	23,5
Rozvod rodičov	12	35,3	6	35,3	18	35,3
Vlastný rozvod	12	35,3	7	41,1	19	37,3
Finančné problémy	11	32,3	7	41,1	18	35,3
Telesné/psychické ochorenie	9	26,5	8	47,1	17	33,3
Psychické týranie	7	20,6	6	35,3	13	25,5
Telesné zanedbávanie	0	0	2	11,8	2	3,9
Umelé prerušenie tehotenstva	3	8,8	1	5,9	4	7,8
Spontánny potrat	2	5,9	0	0	2	3,9
Ťažký pôrod	4	11,8	0	0	4	7,8
Odlúčenie od dieťaťa	3	8,8	3	17,6	6	11,8
Telesné/psychické postihnutie dieťaťa	2	5,9	0	0	2	3,9
Starostlivosť o postihnutého	9	26,5	2	11,8	11	21,6
Náhla smrť blízkej osoby	20	58,8	12	70,6	32	62,7
Smrť blízkej osoby	26	76,5	12	70,6	38	74,5
(pred 16 rokom) násilie v rodine	10	29,4	7	41,2	17	33,3
Svedok lúpeže	11	32,4	8	47,1	19	37,3
Olúpenie	10	29,4	10	58,8	20	39,2
(pred 16 rokom) fyzické týranie	9	26,5	2	11,8	11	21,6
(po 16 roku) fyzické týranie	9	26,5	7	41,2	16	31,4
Sexuálne obťažovanie	5	14,7	3	17,6	8	15,7
(pred 16 rokom) sexuálne dotyky	2	5,9	0	0	2	3,9
(viac ako 16 rokov) sexuálne dotyky	3	8,8	0	0	3	5,9
(pred 16 rokom) nútený sex	1	2,9	0	0	1	1,9
(viac ako 16 rokov) nútený sex	2	5,9	0	0	2	3,9

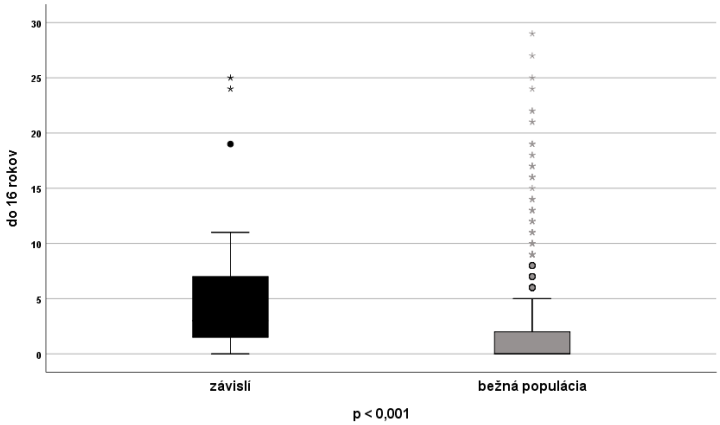
Graf 4.1 Rozdiel v sumárnom skóre stresorov a traumatických udalostí podľa LSC-R medzi skupinou ľudí so závislosťou (N=51) a bežnou populáciou (N=1018)



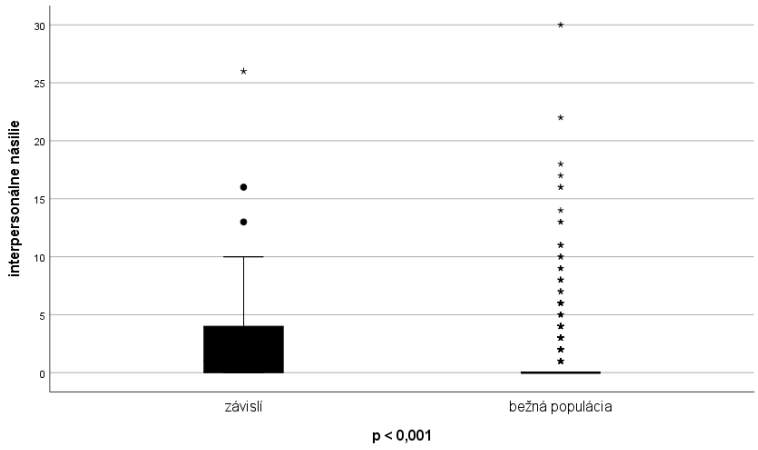
Graf 4.2 Rozdiel v skóre celkovej traumatickej záťaže v LSC-R medzi skupinou ľudí so závislosťou (N=51) a bežnou populáciu (N=1018)



Graf 4.3 Rozdiel v skóre prežitých stresorov a traumatických udalostí do 16 rokov medzi skupinou ľudí so závislosťou (N=51) a bežnou populáciu (N=1018)



Graf 4.4 Rozdiel v skóre interpersonálneho násilia medzi skupinou ľudí so závislosťou (N=51) a bežnou populáciu (N=1018)



Medzi skupinou ľudí so závislosťou od alkoholu (N=34) a iných psychoaktívnych látok (N=17) sme nepozorovali signifikantné rozdiely v žiadnom zo sledovaných skóre Dotazníka životných stresorov (LSC-R). Presnejšie výsledky sú uvedené v tabuľke č. 4.4

Tabuľka 4.4 Rozdiely medzi skupinou ľudí so závislosťou od alkoholu (N=34) a iných psychoaktívnych látok (N=17) v rôznych skóre Dotazníka životných stresorov (LSC-R)

	t	p	Cohenovo d	Rozdiel priemerov
Sumárne skóre	0,60	0,551	0,18	1,77
Traumatická záťaž	0,12	0,906	0,03	0,15
Udalosti prežité do 16 roku života	0,78	0,445	0,24	1,32
Interpersonálne násilie	0,39	0,701	0,10	0,50

4.4. Diskusia

Hlavným cieľom výskumu bolo zistiť, či sa ľudia so syndrómom závislosti líšia od ľudí z bežnej populácie v intenzite a frekvencii prežívania stresujúcich a traumatických udalostí. Sledované boli tiež potenciálne rozdiely medzi skupinou ľudí so závislosťou od alkoholu a iných psychoaktívnych látok. Medzi týmito skupinami neboli pozorované významné rozdiely. Medzi skupinou ľudí so závislosťou a bežnou populáciou sme pozorovali významné rozdiely v intenzite a frekvencii prežívania traumatických a stresujúcich udalostí (sumárne skóre) a to jednak v oblasti interpersonálneho násilia, a tiež v zážitkoch prežitých do 16 roku života. Skupina ľudí so

závislosťou sa významne líšila od bežnej populácie aj v skóre celkovej traumatickej záťaže.

Prevalencia traumatických udalostí je v skupine ľudí s poruchou užívania látok vyššia ako u bežnej populácie. Výskumy hovoria o tom, že približne 97 % ľudí s poruchou užívania látok (Gielen a kol., 2012) uvádza zážitok udalosti, ktorá napĺňa kritérium traumy. Časť výskumných zistení dáva prežitú traumatickú udalosť do súvisu s neskorším rozvojom závislosti (pozri napr. Konkolÿ a kol., 2017). Na bližšiu špecifikáciu kauzality medzi týmito dvoma premennými je však potrebné ďalšie skúmanie. Existuje niekoľko výskumov, ktoré popisujú signifikantný pozitívny vzťah medzi prežitými stresujúcimi a traumatickými udalosťami v detstve a adolescencii a rozvojom závislosti v dospelosti (Carliner a kol., 2016; Casement a kol., 2015; Moustafa a kol., 2018). V prípade ľudí so závislosťou od alkoholu, ktorí zažili zvýšený stres a traumatické udalosti v detstve a adolescencii, sa poukazuje najmä na skorší začiatok užívania alkoholu a tiež na zvýšený počet relapsov počas liečby (Dom a kol., 2007).

Jedným z možných dôsledkov prežitia traumatických udalostí je rozvoj posttraumatickej stresovej poruchy (Yehuda a kol., 2015). Podľa epidemiologických štúdií z celého sveta je celoživotná prevalencia posttraumatickej stresovej poruchy u žien 13,0 - 20,4 % a u mužov 6,2 - 8,2 % a ako najrizikovejšie z hľadiska vývoja PTSP sa javia byť zážitky interpersonálneho násilia, najmä sexuálne zneužívanie a fyzické násilie a tiež kumulatívne vystavovanie potenciálne traumatizujúcim zážitkom (Bryant, 2019). Kessler a kol. (1995) v reprezentatívnej vzorke obyvateľstva USA zistili rôznu častosť výskytu PTSP po rôznych typoch tráum. Pomerne malý bol pri požiaroch/prírodných katastrófach, keď boli ľudia svedkami nehôd alebo násilia, keď mali sami nehodu (vyskyt PTSP v rozmedzí 4,5 - 7,6 %). Najvyšší výskyt PTSP bol po znásilnení, až v 55,5 %. Po účasti vo vojne, zlom zaobchádzaní v detstve, sexuálnom obťažovaní, zanedbávaní v detstve, ohrozovaní zbraňou, telesnom násilí sa výskyt PTSP zaznamenal v rozmedzí 11,5 - 38,8 %. Celoživotnú prevalenciu PTSP v USA autori odhadujú na 7,8 %. U ľudí s poruchou užívania látok môže byť prevalencia rozvoja PTSP približne 3–krát vyššia ako u bežnej populácie (Gielen a kol., 2012; McCaule a kol., 2013), pričom spoločným menovateľom môžu byť popri iných významných faktoroch práve traumatické udalosti z detstva. Tie môžu významne ovplyvniť aj fungovanie v medziľudských vzťahoch, keď v zmysle neistých vzťahových väzieb zvýšia vzťahovú úzkosť a/alebo vyhýbavosť (Kaščáková et al 2020), čo je zase rizikový faktor pre celé spektrum psychopatologických

porúch, nielen komplexnej PTSP (Stovall-McClough, Dozier, 2016). Neliečené PTSP môže narúšať priebeh liečby poruchy užívania látok alebo závislosti od nich (Lotzin, 2018) a na základe našich klinických skúseností odhadujeme, že to môže platiť aj pre nespracované traumy pri rôznych iných klinických obrazoch.

Prevalenciu traumatizácie a PTSP u pacientov na všeobecnom psychiatrickom oddelení v Trenčíne so spádovou oblasťou 170 000 obyvateľov hospitalizovaných v polročnom intervale v r. 2004 zisťovali Hašto a kol. (2011). Išlo o súbor 532 pacientov, teda 92% zo všetkých prijatých pacientov v danom období. Nevyšetrení boli len pacienti s ťažšou demenciou. Traumatické udalosti v anamnéze zistili u 27,26 % a nie „bežný" stresor, ale nespĺňajúci jednoznačne kritériá traumy u 8,65 %, spolu teda boli závažné stresory zistené u viac než tretiny pacientov. Výskyt PTSP bol u udávajúcich traumu 35,17 % a podprahová PTSP u ďalších 26,21%. 38,62 % pacientov nevykazovalo napriek expozícii traumy v priebehu života žiadne symptómy PTSP. Pre diagnostiku bola použitá metodika Štruktúrovaného klinického interview pred PTSP podľa DSM-IV. Autori neskúmali výskyt komorbídnych porúch a iných syndrómov než PTSP u traumatizovaných. Konštatujú význam zisťovania traumy a PTSP v bežnej psychiatrickej diagnostike a pre plánovanie terapie.

Vzhľadom na komplexnosť problémov ľudí so syndrómom závislosti a vysokú prevalenciu traumatických a stresujúcich udalostí v tejto skupine obyvateľstva, je pre adekvátnu a úspešnú liečbu závislostí dôležité zameriavať pozornosť aj na prežité traumatické udalosti počas života. Pri liečbe závislosti je preto dôležité pracovať aj s prípadnou traumatickou anamnézou, ktorá môže byť pre úspešnosť liečby kľúčová. Výskumy poukazujú na signifikantný vzťah medzi prežitými stresujúcimi udalosťami v detstve a adolescencii a rozvojom závislosti v dospelosti, pričom platí, že ľudia, ktorí zažili zvýšený stres v detstve alebo adolescencii sú pre rozvoj závislosti zraniteľnejší. Je preto dôležité hovoriť aj o prevencii takýchto zážitkov v detstve a adekvátnej intervencii po prežití traumy, čo môže pôsobiť preventívne aj vzhľadom na ďalší rozvoj závislosti (Farrelly, 2018).

Do budúceho výskumu plánujeme bližšie pracovať s témou posttraumatickej stresovej poruchy u ľudí so závislosťou od látok alebo poruchou užívania látok. Chceli by sme overiť jej prevalenciu v tejto skupine obyvateľstva a bližšie popísať rozdiely medzi ľuďmi so závislosťou a bežnou populáciou obyvateľstva. Bližšie skúmanie tejto témy môže prispieť k zefektívneniu liečby, ale aj prispieť k ešte dôležitejšej téme, prevencii vzniku závislostí.

Záver

Závislosti od alkoholu a psychoaktívnych látok sú v spoločnosti relatívne často sa objavujúce poruchy , ktorých liečba je (dobre) podchycovaná psychológmi, psychiatrami a inými odborníkmi na duševné zdravie. So syndrómom závislosti sa často spájajú rôzne komorbídne psychiatrické diagnózy (napr. úzkostné poruchy či depresia). Ľudia so závislosťou sú zároveň skupinou s významne vyššou prevalenciou prežitých stresujúcich a traumatických udalostí. Z tohto dôvodu je častou komorbídnou diagnózou aj posttraumatická stresová porucha (PTSP), hoci v našom klinickom súbore nebola diagnostikovaná, čo môže súvisieť s miestnymi diagnostickými zvyklosťami a môže byť ukrytá v diagnóze „zmiešaná porucha osobnosti“, zvlášť ak ide o klinický obraz komplexnej PTSP (Wöller a kol. 2020). Podľa literárnych údajov prevalencia posttraumatickej stresovej poruchy je v skupine ľudí s poruchou užívania látok približne 3-krát vyššia ako v bežnej populácii. Hoci je pre bližšiu špecifikáciu kauzality medzi prežitou traumatickou udalosťou a rozvojom závislosti potrebné ďalšie výskumné skúmanie, existujú výskumy, ktoré poukazujú na súvislosť medzi prežitými stresujúcimi a traumatickými udalosťami v detstve a dospievaní a následným rozvojom závislosti v dospelosti. Pre lepšie porozumenie ľuďom so závislosťou a následné zefektívnenie liečby tohto ochorenia je preto dôležité zameriavať pozornosť, okrem iného, aj na traumatickú anamnézu pacientov.

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KAPITOLA 5

The relationships between resilience and PTSD in people with substance use disorder and the general population: Piloting the relationships using the network approach.

Bibiána Jozefiaková, Matúš Adamkovič, Peter Tavel, Jozef Hašto, Natália Kaščáková

Submitted

Abstract

Background The present paper aims to examine the complex connections between resilience and the DSM-5's posttraumatic stress disorder (PTSD) clusters in people with substance use disorder (SUD) and the general population.

Methods The network approach was utilized to explore these relationships. Data from a clinical sample was collected between October 2021 and April 2022 using Computer-assisted personal interviewing. In total, data from 74 participants were collected. Using the Life Stressor checklist Revised, we identified participants who reported experiencing a traumatic or stressful event. These participants were then administered the PTSD Checklist.

Results In the sample of individuals with SUD who experienced traumatic event, the average edge-weight between the PTSD clusters was .24, while resilience was very weakly connected to the PTSD clusters, with the average edge-weight of -.02. Similarly, in the general traumatized population, the average edge-weight between the PTSD clusters was .30, and the connection between resilience and the PTSD clusters was -.05. The results suggest that resilience is weakly connected to PTSD clusters in both samples. Although resilience was lower in the SUD sample, the difference was not significant.

Conclusion These findings highlight the importance of further research on the relationships between PTSD clusters and resilience in individuals with addiction and the general traumatized population.

Keywords: resilience, PTSD, network analysis, SUD

5.1 Introduction

PTSD and substance use disorder (SUD) are both relatively common psychiatric disorders that often co-occur (McCauley et al., 2012; Najavits et al., 2020). The prevalence of current PTSD in individuals with SUD is significantly higher than in the general population, with rates ranging from 25.3% to 49% (Driessen et al., 2008; Gielen et al., 2012; Pietrzak et al., 2011). The co-existence of alcohol misuse was found in 9.5% of people with PTSD, while other substance use is observed in 12.6% (Qassem et al., 2021). Even in the absence of a full-blown PTSD diagnosis, the presence of a history of trauma and symptoms of PTSD may complicate the treatment and prognosis of SUD a ten Holt et al., 2022) as greater PTSD symptom severity is associated with greater subsequent alcohol use. Conversely, greater alcohol use is also associated with greater future PTSD symptom severity (Tripp et al., 2020).

Based on the DSM-5, PTSD is defined by various criteria (clusters): **(A)** exposure to actual or threatened death, serious injury, or sexual violence through one or more of the following ways: directly experiencing the traumatic event(s); witnessing the event(s) as it occurred to others; learning that the traumatic event(s) occurred to a close family member or friend; and repeated or extreme exposure to aversive details of the traumatic event(s); **(B)** the presence of one or more of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred: recurrent, involuntary, and intrusive distressing memories of the traumatic event(s); recurrent distressing dreams (nightmares) with content and/or effect of the dream are related to the traumatic event(s), dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) is recurring, intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble some aspect of the traumatic event(s), and marked physiological reactions to internal or external cues that symbolize or resemble and aspect of the traumatic event; **(C)** persistent avoidance of internal and (or) external stimuli associated with the traumatic event(s); **(D)** negative alterations in cognitions and mood related to the traumatic event that begin or worsen after the event(s) has occurred, as evidenced by two (or more) of the following: inability to remember an important aspect of the traumatic event(s), persistent and exaggerated negative beliefs or expectations about oneself, others, or the world, persistent distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others, persistent negative emotional state,

markedly diminished interest or participation in significant activities, feelings of detachment or estrangement from others, and persistent inability to experience positive emotions; **(E)** marked alterations in arousal and reactivity associated with the traumatic event(s), as evidenced by two (or more) of the following: irritable behavior and angry outbursts, reckless or self-destructive behavior, hypervigilance, exaggerated startle response, problems with concentration, and sleep disturbances. It is important to note that (F) duration of the disturbance is more than 1 month, (G) causes clinically significant distress or impairment in social, occupational, or other important areas of functioning, and (H) the disturbance is not attributable to the physiological effects of a substance or another medical condition (American Psychiatric Association, 2013).

Experiencing traumatic events is relatively common, with a prevalence of around 70% in the general population (Benjet et al., 2016). However, the prevalence of traumatic events in individuals with SUD is much higher, about 97.4% (Gielen et al., 2012), which increases the risk of developing PTSD or other mental health difficulties. The SUD-PTSD relationship is nonetheless specific. In some instances, alcohol is used as a coping strategy to alleviate PTSD symptoms (see self-medication model (Khantzian, 2003)). Not all individuals who experience traumatic events will, however, develop PTSD. Resilience, defined as the ability to adapt to stress and adversity, may play a crucial role in determining an individual's response to trauma. Studies have shown that resilience may serve as a protective factor against the development of PTSD in individuals who have experienced traumatic events (Lee et al., 2016; Reyes et al., 2019; Dhungana et al., 2022).

The present study aimed to (1) examine the relationships between resilience and the DSM-5's posttraumatic stress disorder (PTSD) clusters in the population of people with substance use disorder and to (2) compare these with the relationships observed in general population using the network approach. The network approach was utilized to identify the complex relationships between resilience and PTSD symptom clusters, which might be particularly important for individuals with SUD. However, it is important to acknowledge that the relationship between SUD and PTSD may exhibit bidirectional dynamics. This mutual interaction underscores the need for tailored interventions that consider both disorders simultaneously, potentially addressing trauma-related issues as a preventive measure or treatment focus. By doing so, interventions can be more effective in addressing the complex interplay between these conditions and promoting long-term recovery.

5.2. Materials and methods

5.2.1 Participants and data collection

Data from a clinical sample was collected between October 2021 and April 2022 using Computer-assisted personal interviewing (CAPI) (Sainsbury et al., 1993). In total, data from 74 participants was collected. Using the Life Stressor Checklist Revised (Wolfe et al., 1996), we identified 69 participants (93% of the total sample) who reported experiencing a traumatic or stressful event. These participants were then administered the PTSD Checklist (PCL-5) (Weathers et al., 2013). The study was approved by the Ethics Committee of the Philip Pinnel Psychiatric Hospital at 29/9/2020 (PAP-20) and Centre of Social and Psychological Sciences, Slovak Academy of Sciences 17/5/2021.

To compare the SUD sample with a representative sample of general population (based on quota characteristics for gender, age, region, and education), data from a bigger longitudinal project studying the dynamics of a mental health of a representative sample of Slovak inhabitants was used. This data was collected online in July 2022. Using the Stressful Life Events Screening Questionnaire (SLES) (Goodman et al., 1998), 944 participants (from a total sample of N = 1819; 52%) who reported experiencing a traumatic or stressful event were identified. These participants were then administered the PTSD Checklist (PCL-5) (Weathers et al., 2022). The demographic characteristics and the detailed information about the prevalence of traumatic events in both samples is present in Table 5.1 and Table 5.2, respectively.

Table 5.1 Demographic characteristics of the clinical sample (N=69) and a representative sample (N= 944)

	Clinical sample		Representative sample	
	N	**%**	**N**	**%**
Gender				
Male	53	76.8	471	49.9
Female	16	23.2	473	50.1
Age				
16-18 years	0	0	8	0.1
19-24 years	3	4.3	97	10.3
25-34 years	24	34.8	161	37.6
35-44 years	25	36.2	180	19.1
45-54 years	11	15.9	172	18.2
55-64 years	4	5.8	170	18.0
65 or more	2	2.9	153	16.2
Diagnoses (ICD-10)*				
F10	28	37.8	-	-
F11-F15	36	48.6	-	-
F63	12	16.2	-	-
Education				
Primary school	12	17.4	20	2.1
Secondary vocational school	17	24.6	189	20.0
High school	30	43.5	419	44.4
University	10	14.5	216	22.9

* International Classification of Diseases 10th Revision

Table 5.2.Prevalence of different types of stressful and traumatic events in both samples (clinical sample N = 69; general population N = 944)

	Clinical sample	**General population**	
Stressful/traumatic event	**N (%)**	**N (%)**	***Z (p-value)***
Natural disaster (earthquake, hurricane/storm, fire, explosion)	16 (23.2%)	200 (21.2%)	0.39 (.670)
Serious accident – witness	**56 (81.2%)**	**220 (23.3%)**	**10.42 (<.001)**
Robbery witness	**37 (53.6%)**	**49 (5.2%)**	**13.93 (<.001)**
Forced sex before the age of 16	**7 (10.1%)**	**31 (3.3%)**	**2.90 (.004)**
Sexual touching before the age of 16	3 (4.3%)	68 (7.2%)	-0.90 (.368)
Serious physical/mental illness	30 (43.5%)	365 (38.7%)	0.79 (.430)
Unexpected death of a loved one	**40 (58.0%)**	**355 (37.6%)**	**3.35 (<.001)**
Physical harm from parent	**30 (43.5%)**	**129 (13.7%)**	**6.57 (<.001)**
Physical harm from partner	**22 (31.9%)**	**103 (10.9%)**	**5.11(<.001)**
Witness the killing, injury, or murder of another person	**21 (30.4%)**	**65 (6.9%)**	**6.77 (< .001)**

Note: When possible, the items on prevalence of traumatic events from the LSC (clinical sample) and the SLES (general population) were matched. For the item 'Witness the killing, injury, or murder of another person,' clinical data are compared with one item from the ACE-IQ (WHO, 2018). The frequencies are compared using a z-test.

Table 5.3 Prevalence of stressful or traumatic events in clinical population (N=69)

Stressful/traumatic event	N	%
Separation/divorce of parents	26	37.7
Own separation/divorce	26	37.7
Financial difficulties	43	62.3
Physical neglect	9	13.0
Emotional abuse	24	34.8
Sexual touching after the age 16	3	4.3
Sexual harassment	7	10.1
Witness of a family violence – before the age of 16	32	46.4
Caring for a loved one with disability	17	24.6
Severe physical or mental handicap of a child	2	2.9
Separation from your own child	12	17.4
Miscarriage (N=16) *	5	31.3
Incarceration of a close person	18	26.1
Own incarceration	20	28.9
Foster care or adoption	5	7.2
Induced abortion (N=16) *	7	43.8
Complicated delivery (N=16) *	6	37.5
Death of a loved one	61	88.4
Note: * = these questions were asked only to women		

5.2.2 Measures

All the questionnaires were translated using the double forward and reconciliation method. Resilience was measured using Brief Resilience Scale validated in Slovak language (BRS) (Smith et al., 2008; Furstova et al., 2022). BRS measures resilience as the ability to recover from a stressful event and consists of 6 items (ω_{total} = .87).

Posttraumatic stress disorder checklist (PCL-5) (Weathers et al., 2022) was used to measure PTSD symptoms using 20 symptoms of PTSD described in DSM-5 (APA, 2013). The reliability values for each symptom cluster were reported as follows: (1) Cluster B ω_{total} = .84; (2) Cluster C ω_{total} = .77; (3) Cluster D ω_{total} = .92; and (4) Cluster E ω_{total} = .86.

The Life Stressor Checklist - Revised (LSC-R) (Wolfe et al., 1996) was used to assess experienced traumatic events.

To measure traumatic events in the general population modified version of the Stressful Life Events Screening Questionnaire was used (Goodman et al., 1998).

5.2.3. Statistical analysis

The analyses were performed on two samples: (1) a sample of people treated in an addiction center, from which a majority (93%) reported experiencing some traumatic

or stressful event, and (2) a representative sample of the general population who experienced a traumatic event. First, sum scores for each PTSD cluster, as well as resilience, were calculated. Then, in each sample, a network model was estimated to understand the role of resilience in the context of the PTSD clusters. The networks were estimated using the EBICglasso estimator, with the tuning parameter set to 0 to produce denser networks. The centrality of resilience in each network was evaluated based on its strength index. Bootstrapped difference tests were performed to examine whether the strength parameters of each variable and the magnitude of the relationships between the variables within the networks differ significantly. The networks' estimation performance, as well as the stability of the parameters, were assessed. To compare the results obtained by the networks across the two groups, the network comparison test was employed. The analyses were conducted in R, using the bootnet (Epskamp et al., 2018) and NetworkComparisonTest (Van Borkulo et al., 2017) packages.

5.3 Results

Descriptive characteristics of the focal variables and Hedges' s representing the effect sizes of group differences are presented in Table 4. In summary, the SUD group had a slightly lower levels of resilience (g = -0,18), and scored higher (medium-to-large effects; gs = 0.36 - 0.56) on PTSD clusters B, C, and D. In PTSD cluster E, a negligible difference between the SUD group and general population was observed (g = 0.04).

Table 5.4 Descriptive characteristics and group comparisons

	M	SD	M	SD	Hedges' g
Resilience	3.05	0.78	3.21	0.88	-0.18
PTSD -cluster B	1.31	1.02	0.74	0.83	0.68
PTSD - cluster C	1.45	1.19	0.90	0.97	0.56
PTSD - cluster D	1.10	1.03	0.79	0.87	0.36
PTSD - cluster E	0.82	0.85	0.79	0.85	0.04

Note: PTSD clusters defined in DSM 5 as: (1) cluster B: re-experiencing, (2) cluster C: avoidance, (3) cluster D: negative cognitions and mood, (4) cluster E: arousal

In the sample of participants with SUD, the average edge-weight between the PTSD clusters was .25. However, resilience was found to be very weakly connected to the PTSD clusters, with an average edge-weight of -.01. Specifically, one of the four connections was regularized to zero, while the other three were 0.06, -.05 and -.07. Thus, resilience had the lowest strength index. The observed patterns were similar for the general traumatized population, but in this case, the relationships were slightly stronger.

The average edge-weight between the PTSD clusters was .31. On the other hand, the connection between resilience and the PTSD clusters was -.06 (no edge regularized to 0). Despite the relatively modest sample size of the SUD sample, the estimates of the strength indices were stable in both subgroups, with CS-coefficients of .52 and .75 for the SUD sample and the general traumatized population, respectively. When compared across the two groups, resilience was lower in the SUD sample, but the difference was not significant (strength value difference = .05, p = .597).

Figure 5.1. Networks of PTSD clusters and resilience in the SUD (A) and general population (B). PTSD clusters defined in DSM 5 as: (1) cluster B: re-experiencing, (2) cluster C: avoidance, (3) cluster D: negative cognitions and mood, (4) cluster E: arousal.

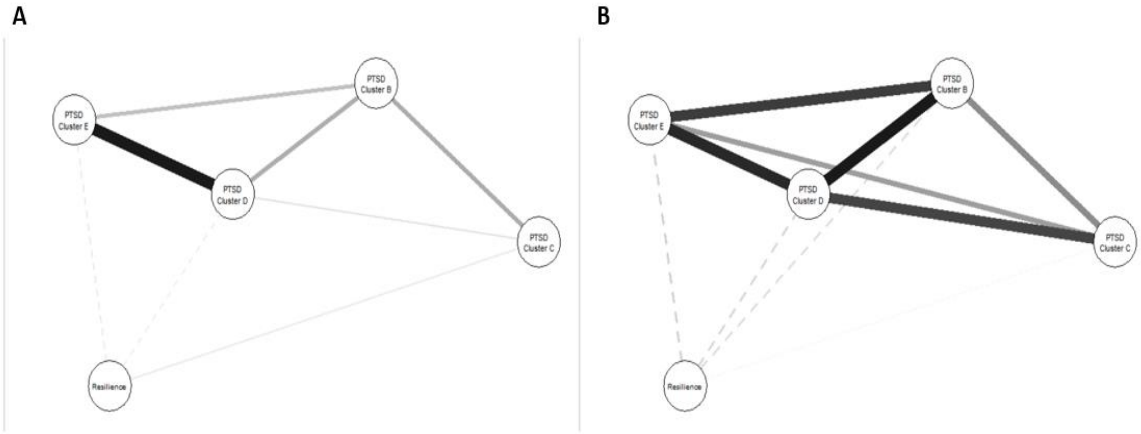
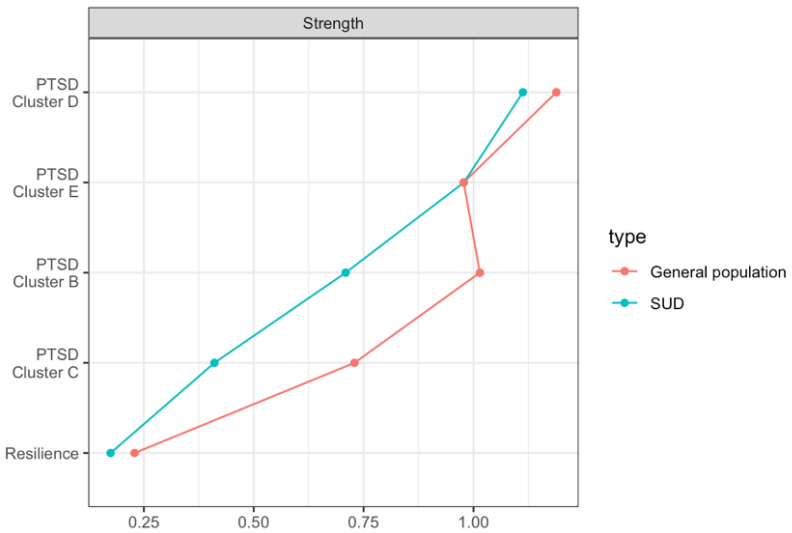


Figure 5.2. Strength index of PTSD clusters and resilience in the SUD and general population. PTSD clusters defined in DSM 5 as: (1) cluster B: re-experiencing, (2) cluster C: avoidance, (3) cluster D: negative cognitions and mood, (4) cluster E: arousal.



5.4 Discussion

This study aimed to investigate the associations between PTSD clusters, as conceptualized in DSM-5 ((B) re-experiencing; (C) avoidance; (D) negative cognitions and mood, and (E) arousal) and resilience in a sample of participants with SUD and a representative sample of the general population of people who survived potential traumatic or stressful event. Based on our results, resilience has weak negative associations with PTSD clusters in both populations, with slightly stronger connections observed in the general population. Within the group of individuals with SUD who have experienced a traumatic event(s), higher percentages were observed in several potentially traumatic event(s), such as witnessing a serious accident and/or robbery, experiencing forced sexual activity before the age of 16; the unexpected death of a loved one; physical harm from a parent and/or partner; and witnessing the killing, injury, or murder of another person.

Resilience, as the ability to rebound from adversity and adapt to stressful life circumstances (American Psychological Association, 2020), involves a set of dynamic processes that are influenced by personal characteristics, life experiences, and external support systems (Liu et al., 2017). Resilience should not be regarded as a passive reaction to the difficult times, nor should it be considered merely the absence of psychopathology or the reverse side of PTSD (Kalisch et al., 2017). Instead, it encompasses a set of processes that can change over time. Longitudinal studies that have tracked symptom levels following trauma indicate that while many individuals experience higher symptoms of PTSD or other mental health difficulties immediately after a traumatic event, the majority naturally recover (Galatzer-Levy et al., 2018). Thus, resilience represents a dynamic capacity to restore well-being following stressful or traumatic life events, extending beyond a stable trait.

Given the high prevalence of traumatic experiences in the general population and particularly among individuals with SUD (Belfrage et al., 2023; Gielen et al., 2012) it has been often assumed that resilience plays a substantial role in mitigating the development and maintenance of PTSD symptoms, serving as a psychological buffer against trauma (Wrenn et al., 2011). The slight, albeit not significant, reduction of resilience observed in the SUD sample compared to the general population underscores that resilience is not uniformly distributed among different groups. This suggests the influence of various psychosocial factors, such as SUD, which may impact an individual's ability to cope with trauma. Based on the previous findings, individuals diagnosed with substance use

disorder (SUD) have a higher incidence of childhood trauma and adverse experiences in their medical history (Leza et al., 2021; Kascakova et al., 2022). Furthermore, due to the lifestyle associated with SUD, they are more frequently exposed to potential traumatic or stressful events later in life (Jozefiakova et al., 2021; Cicchetti et al., 2019) which can be significantly related to an overall higher vulnerability and decreased resilience to stress (Simeon et al., 2007; Maercker et al., 2016). Within our research group of individuals with SUD, significant differences were observed, particularly in situations where a person witnessed a serious accident, robbery, killing, injury, or murder of another person. Similarly, there were notable differences in the experience of unexpected death of a loved one, physical harm from a parent or partner, and forced sexual activity before the age of 16. These results are consistent with other research findings from authors who also highlight increased percentages of traumatic experiences, especially in the areas of physical assault in childhood, serious accidents during their lifetime (such as physical assault in adulthood, robberies, and muggings), and witnessing someone's death or assault among individuals with SUD (Dragan et al., 2007; Degenhardt et al., 2022; Belfrage et al., 2023; Jozefiakova et al., 2021). Based on our data, it appears that in addition to resilience support, directly addressing trauma in the treatment of SUD may be equally important (Simpson et al., 2021).

This study provides valuable insights into the complex relationships between resilience and PTSD in individuals with SUD as well as the general population. Understanding the genetic and environmental factors influencing these connections is crucial for development of more effective interventions for PTSD treatment, particularly in the context of substance use disorder. Notably, recent large-scale genome-wide association studies have estimated the heritability of both PTSD and SUD to range from 5-20% (Nievergelt et al., 2019) and 50-70% (Hatoum et al., 2022), respectively. While fostering resilience remains an important therapeutic aim, the results suggest that interventions should also directly target PTSD symptomatology and possibly other related factors to enhance treatments outcomes. If PTSD symptoms left untreated, individuals with PTSD and SUD are at increased risk of relapse and the development of other mental health difficulties. Furthermore, individuals with this comorbidity often present to treatment with more severe psychosocial problems and are more likely to drop out of treatment (Blakey et al., 2022; Roberts et al., 2020). For these reasons, several integrated treatment models that address symptoms of both disorders have been developed (Killeen et al., 2015). The most evaluated therapeutic strategies that manage negative PTSD and

SUD related cognitions and beliefs are Integrated Cognitive-Behavioral Therapy (ICBT) (McGovern et al., 2011), and Concurrent Treatment of PTSD and SUD using Prolonged Exposure (COPE) (Back et al., 2014). However, based on the results from a systematic review and meta-analysis (Roberts et al., 2022) the COPE model did not yield significant benefits when compared to SUD-based interventions alone. In general, trauma-focused intervention delivered alongside treatment for SUD led to improvements in PTSD symptom severity and diagnosis post-treatment when compared against intervention for SUD only (Roberts et al., 2022). By targeting both resilience and PTSD, interventions can offer comprehensive support and facilitate better recovery for individuals affected by trauma and substance use disorder.

Limits and Perspectives for Future Research

This study has several limitations that should be acknowledged. Firstly, the modest sample size of the SUD group may limit the accuracy of the findings. Replication studies with larger samples are needed to ensure the generalizability and robustness of the observed associations. Despite this limitation, it is worth noting that the study found relatively stable estimates of the strength index in both subgroups, which strengthens the verisimilitude of the observed patterns within the samples. Secondly, the study utilized a cross-sectional design, which limits the ability to establish causality or examine changes in the relationship between variables over time. At the same time, it is crucial to underscore the bidirectional nature of the relationship between SUD and PTSD. While our study has illuminated certain aspects of this complex interplay, it's essential to recognize that individuals with SUD may use substances to cope with the distressing symptoms of PTSD, and conversely, substance use can contribute to the development or exacerbation of PTSD symptoms. Additionally, the study did not account for potential confounding variables that could influence the associations between PTSD clusters and resilience. Factors such as age, gender, comorbid mental health conditions, or specific trauma characteristics could have impacted the results. Therefore, further research should consider focusing on these variables to gain a more comprehensive understanding of the relationships between the PTSD clusters and resilience. Despite these limitations, this study has a significant implication for the design of interventions targeting PTSD and resilience, particularly in the context of substance use disorder. By recognizing the weak connections between resilience and PTSD clusters, interventions can focus on addressing

both the symptoms of PTSD and enhancing resilience. This dual approach may lead to more comprehensive and effective treatment outcomes.

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KAPITOLA 6

COVID anxiety and its predictors among Slovak adolescents

Bibiána Jozefiaková, Natália Kaščáková, Jana Furstova, Gabriela Šarníková, Jozef Hašto, Peter Tavel

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Abstract

Introduction: The COVID-19 pandemic and its related restrictions, mainly social distancing, had an impact on the mental health of various groups, including adolescents.

Methods: The main goal of our study was to explore the impact of gender, age, resilience (measured using the Brief Resilience Scale), attachment anxiety, attachment avoidance (both measured using the Experiences in Close Relationships Revised Scale for adolescents), and mental and general health (measured using items of SF-8 Health Survey) on COVID anxiety (measured using the COVID Anxiety Scale) among a sample of Slovak adolescents (N = 1,786, age 15 to 19, mean age = 16.8, SD = 1.2). The data were collected online between 13 April and 24 May 2021.

Results: Four nested linear regression models were fitted to the data and evaluated. The significant predictors that had a greater effect than our smallest effect size of interest ($\beta = 0.10$) were gender ($\beta = -0.26$, $p < 0.001$, where boys had lower scores in COVID anxiety), general and mental health ($\beta = -0.13$ and $\beta = -0.14$, respectively, both with $p < 0.001$), resilience ($\beta = -0.12$, $p < 0.001$), and attachment avoidance ($\beta = -0.11$, $p < 0.001$). Similarly, age and attachment anxiety were significant predictors with a lower effect size ($\beta = 0.06$, $p = 0.003$, and $\beta = 0.09$, $p < 0.001$, respectively).

Discussion: Our results are in line with previous research findings highlighting the importance of prevention and interventions programs focused mainly on preventing loneliness and social disconnection, fostering secure attachment with parents and peers, and increasing the resilience of adolescents, especially in the stressful time of a pandemic, to promote their mental health.

6.1 Introduction

Over the last 2 years, the COVID-19 pandemic has significantly affected the lives of all people, including adolescents. The restrictions associated with the pandemic, which mainly involved social distancing, had a great impact on the functioning of the school system. In many countries, including Slovakia, students in primary, secondary and higher education shifted, after sudden breaks, completely to distance learning, without the possibility of meeting their classmates and teachers. Besides education, young people also experienced other negative consequences of the pandemic, such as the financial and job instability of their families, the disruption of their general and family social relationships, acute and even chronic stress, and more.

In general, stress and stressful life events are significant predictors of mental health difficulties in adolescents (DuBois et al., 1992; Lindholdt et al., 2022). According to the systematic review from Bor et al. (2014), there has been in the 21st century an increase in the internalizing of problems (anxiety, depression), manifested mainly in girls, compared to the 20th century. Based on the meta-analytical results of Polanczyk et al. (2015), the prevalence of anxiety and depression among children and adolescents is 6.5% and 2.6%, respectively. In times of pandemic, there is even more risk of mental health problems, manifested in symptoms of depression, anxiety, or posttraumatic stress disorder (PTSD) (e.g., Douglas et al., 2009; Liu et al., 2020). According to a meta-analysis across 29 samples and 80,879 youth, the pooled prevalence of clinically elevated depression and anxiety symptoms during COVID-19 was 25.2% and 20.5%, respectively (Racine et al., 2021). According to a systematic review by Loades et al. (2020), there is a clear association between social isolation, loneliness and mental health problems arising during the pandemic among children and adolescents. Because socialization is very important for people in this age, the restrictions related to the pandemic may also play a significant role in mental health difficulties (e.g., Cohen et al., 2021). Adolescents with psychiatric history are an even more vulnerable group, possibly due to the disruption of psychiatric/psychological care, higher COVID-19-related anxiety, and possible difficulties in coping with lockdowns (e.g., Guessoum et al., 2020). Conversely, resilience, as an ability to cope with or bounce back from stressful events, may act as a protective factor against negative mental health outcomes (e.g., Hu et al., 2015; Anyan and Hjemdal, 2016; Li and Miller, 2017). According to Beames et al. (2021), higher resilience is related to decreased psychological distress and to increased positive outcomes. Their research pointed out that the most reported active coping strategies

among Australian adolescent were socializing, engaging in hobbies, and exercise, which also highlight the importance of peer relationships for teenagers. This research also describes gender as an important factor related to resilience, where female gender was related to lower resilience. When comparing students based on age, younger students experienced significantly more distress associated with COVID-19 (e.g., Zhou et al., 2020).

Another important factor influencing the mental health of adolescents is attachment. While insecure attachment is linked with the development of internalizing problems, anxiety, and depression in adolescents (Brumariu and Kerns, 2010), more secure attachment to parents is associated with fewer depressive symptoms in this group (Kerstis et al., 2018). Attachment theorists emphasize the importance of sensitive and responsive interactions between parent and child for building trust towards oneself and others and for learning self-regulation strategies (Bowlby, 1969). The quality of early caregiving experiences and attachment style may affect stress responsivity: Securely attached adolescents may be more successful in self-regulating strategies and in adaptive coping responses (Howard and Medway, 2004). Anxiously (preoccupied) attached adolescents tend to engage in emotion-focused coping, such as rumination and self-blame, and to focus their attention on their own distress rather than focusing on solutions to current problems (Mikulincer et al., 2003). Avoidantly attached adolescents attempt to deal with distress and threats alone, using suppression and self-reliant strategies (Brenning et al., 2012). While relationships with caregivers/parents usually consist of the primary attachment bond, in adolescence, peer relationships begin to increasingly take on critical attachment functions (Allen & Tan, 2016).

Pandemics may be a challenging stressor that activates the attachment system. Individuals with higher attachment anxiety may be prone to experience more health anxiety, leading to maladaptive responses to the COVID outbreak (e.g., excessive hand washing, social isolation, extended fear from infection) (Asmundson and Taylor, 2020). In an Italian population sample, features of both secure and avoidant attachment style appeared to be protective for the risk of higher psychological burden during the COVID-19 outbreak compared to the anxious attachment style (e.g., Moccia et al., 2020).

Although a systematic review of longitudinal cohort studies showed that after an initial increase in mental health symptoms after the outbreak of COVID-19, there was decrease of problems comparable to pre-pandemic levels in mid-2020 among most population subgroups (e.g., Robinson et al., 2022). From a mental health prevention

perspective, it may be important to also focus on younger age groups. Adolescents may be a particularly vulnerable group, as biopsychosocial stressors can have far-reaching consequences for future mental health, due to neuro-immuno-endocrinological changes induced by the stress of social isolation (de Figueiredo et al., 2021).

Based on the mentioned facts about potential risk and protective factors influencing psychological adjustment to the pandemic, the main goal of present paper was to examine COVID-19 anxiety and its association with sociodemographic characteristics, mental and physical health, resilience, attachment anxiety and avoidance among adolescents in Slovakia. We hypothesized that (1) girls will have higher COVID anxiety; (2) impaired mental and physical health will be associated with higher COVID anxiety; (3) adolescents with higher attachment anxiety will have higher score in COVID anxiety; and (4) less resilient adolescents will have higher score in COVID anxiety.

6.2 Materials and methods

6.2.1 Participants and data collection

Data was collected online from 13 April to 24 May 2021. In Slovakia, the state of emergency lasted from 1 October 2020 until 14 May 2021. Schools were in the distance learning regime, except the resumed full-time learning for the first class of primary and the last class of secondary school from 8 February 2021. Data from a total of 1786 adolescents were collected (age 15–19 years, mean age = 16.8, SD = 1.2). Two-thirds (66.3%) of the research sample were females (N = 1,184) and all the respondents were high-school students. The participants received a web link for the survey from their school management. Data collection was in line with the Declaration of Helsinki, and participation in the study was voluntary and anonymous. No incentives were offered for taking part in the survey. The study was reviewed and approved by the Scientific Ethics Committee of Palacky University Olomouc (NO 2021/11).

6.2.2 Measures

Demographics—participants were asked to report their gender (male, female), age (continuous) and type of school where they were studying.

COVID anxiety scale

The COVID Anxiety Scale (Silva et al., 2020) contains 7 items that can be answered on a 4-point Likert scale, where 0 = not applicable to me, 3 = very applicable to me. The reliability of the scale is ωtotal = 0.92 (mean score = 6.25, SD = 5).

SF-8 Health survey

The SF-8 Health Survey consists of 8 items, each of them representing a specific domain: (1) general health (GH), (2) physical functioning (PF), (3) role physical (RP), (4) bodily pain (BP), (5) vitality (VT), (6) social functioning (SF), (7) mental health (MH), and (8) role emotional (RE). The Slovak version of the questionnaire is similar to the Czech version (Bartuskova et al., 2018), where the participant is asked to evaluate subjective health in the last 4 weeks. Items 1–4 can be answered on a 6-point scale and items 5–8 on a 5-point scale. In the presented study, we worked only with item 1 (general health) and item 7 (mental health). For the purpose of this study, the scoring of these items was reversed so that a higher score corresponds to better health.

Brief resilience scale

The Brief resilience scale (BRS, Smith et al., 2008) consists of 6 items that can be answered on a 5-point Likert scale (1 = strongly disagree, to 5 = strongly agree). The BRS measures resilience as the ability to recover from a stressful experience. The Slovak version of the BRS shows good psychometric properties, reliability and validity (Furstova et al., 2021). The reliability of the scale on the research sample was ωtotal = 0.86 (mean score = 2.98, SD = 0.9).

The experiences in close relationships-revised for adolescents

The ECR-R questionnaire for adolescents is a self-report measure consisting of 20 items, with 10 items representing (1) attachment anxiety and (2) attachment avoidance (Wilkinson, 2011). The items can be answered on a 7-point Likert scale (1 = strongly disagree, to 7 = strongly agree). The reliability of the attachment anxiety subscale was ωtotal = 0.89 (mean score = 37.08, SD = 14.11), and of the attachment avoidance it was ωtotal = 0.80 (mean score = 29.93, SD = 10.73).

6.2.3 Statistical analyses

First, the reliabilities of the measures were calculated using the total omega coefficient. For the main analysis, several nested linear regression models were estimated. The dependent variable was COVID anxiety, while gender, age, resilience and attachment anxiety and attachment avoidance were treated as predictors. The psychological variables were standardized. The predictors were divided into 3 blocks [(1) sociodemographics – age, gender, (2) sociodemographics, resilience, (3) sociodemographics, resilience, attachment avoidance, and (4) sociodemographics, resilience, attachment avoidance, and attachment anxiety]. Each one of the 4 blocks is presented as an individual model (see Table 6.1). The smallest effect size of interest (SESOI) for these models was set to $\beta = 0.10$ (based on Cohen, 1988).

Table 6.1 Descriptive characteristics of the data, comparison of COVID anxiety between sociodemographic groups.

Characteristic	**n (%)**	**CAS mean (SD)**	**p-value**
Total	1786 (100)	6.23 (4.98)	
Gender			<0.001
Female	1184 (66.3)	7.05 (5.03)	
Male	602 (33.7)	4.60 (4.46)	
School			0.082
Art school (conservatory)	42 (2.4)	8.17 (5.69)	
Grammar school	406 (22.7)	6.26 (5.05)	
Vocational school	1057 (59.2)	6.15 (4.90)	
Apprenticeship	281 (15.7)	6.15 (5.03)	
	mean (SD)	**Correlation with CAS**	**p-value**
Age	16.79 (1.15)	0.05	0.058
Health			
SF-8 General health	4.28 (1.23)	-0.27	<0.001
SF-8 Mental health	3.10 (1.30)	-0.32	<0.001
Resilience			
BRS sum score	2.97 (0.90)	-0.29	<0.001
Attachment			
ECR-R anxiety subscale	37.15 (14.10)	0.27	<0.001
ECR-R avoidance subscale	39.91 (10.70)	0.04	0.063

Note: CAS = COVID Anxiety Scale. Comparison of groups was performed with the t-test and one way ANOVA; Pearson correlation coefficients are reported. A higher SF-8 score means better health.

Afterwards, the Pearson correlation coefficient was calculated to examine the relationship between general health, mental health (variables measured by the SF-8

Health Survey) and COVID anxiety level. All the statistical analyses were performed in the R software, version 4.6.1 (R Core Team, 2020).

6.3 Results

Background characteristics

The background characteristics of the Slovak adolescent sample are presented in Table 2. The data comprised 1,786 participants with the mean age of 16.8 years; 66.3% were female. A significantly higher level of COVID anxiety was reported by girls [$t(10.12) = p < 0.001$, Cohen's $d = 0.51$]. Students attending art schools (conservatories) also reported higher mean COVID anxiety than students attending other types of high school; however, the difference was not significant. There were no significant group differences found between the counties and size of municipality either. COVID anxiety was positively correlated significantly with attachment anxiety and significantly negatively correlated with general health, mental health, and resilience (see Table 6.3).

Table 6.2 Results of linear regression models assessing the effect of background characteristics, health (SF-8), resilience (BRS) and attachment anxiety and avoidance (ECR-R) on the level of CAS.

Predictor	**Model 1**		**Model 2**		**Model 3**		**Model 4**	
	Beta	Std. error	Beta	Std. error	Beta	Std. error	Beta	Std. error
Background characteristics								
Gender (male vs female)	-0.50 ***	0.05	-0.31 ***	0.05	-0.26 ***	0.05	-0.26 ***	0.05
Age (years)	0.05 *	0.02	0.05 *	0.02	0.05 **	0.02	0.06 **	0.02
Art school (conservatory)	reference group							
Grammar school	-0.36 *	0.16	-0.27	0.15	-0.25	0.15	-0.25	0.15
Vocational school	-0.36 *	0.15	-0.26	0.15	-0.25	0.15	-0.26	0.15
Apprenticeship	-0.36 *	0.16	-0.27	0.16	-0.27	0.15	-0.28	0.15
Health (SF-8)								
General health			-0.14 ***	0.03	-0.12 ***	0.03	-0.13 ***	0.03
Mental health			-0.20 ***	0.03	-0.15 ***	0.03	-0.14 ***	0.03
Resilience (BRS)					-0.14 ***	0.03	-0.12 ***	0.03
Attachment (ECR-R)								
Anxiety							0.09 ***	0.03
Avoidance							-0.11 ***	0.02
R^2	0.061		0.140		0.154		0.167	
R^2 difference			0.079		0.014		0.013	

Note: * p<0.05; ** p<0.01; *** p<0.001

Table 6.3 Correlation coefficients between the CAS, age, health (SF-8), resilience (BRS), and attachment anxiety and avoidance (ECR-R).

	Mean (SD)	Correlation with CAS	p
Age	16.79 (1.15)	0.05	0.058
Health			
SF-8 General health	4.28 (1.23)	-0.27	<0.001
SF-8 Mental health	3.10 (1.30)	-0.32	<0.001
Resilience			
BRS sum score	2.97 (0.90)	-0.29	<0.001
Attachment			
ECR-R anxiety subscale	37.15 (14.10)	0.27	<0.001
ECR-R avoidance subscale	39.91 (10.70)	0.04	0.063

Note: CAS = Covid Anxiety Scale; Pearson correlation coefficients are reported.

Predictors of adolescent COVID anxiety

The effect of the background characteristics of the participants, health, resilience and attachment anxiety and avoidance on the level of adolescent COVID anxiety was assessed using nested linear regression models. In Model 1, the background characteristics explained 6.1% of the total variance of the COVID anxiety. In this model, a higher level of the COVID anxiety was associated with female gender, higher age and students attending art schools (see Table 1). After adding health to the model (Model 2), the proportion of the explained variance increased by 7.9%. The effect of general and mental health was significant; a higher score in the health domains was associated with a lower level of COVID anxiety. In Model 3, after adding resilience to the model, the explained variance increased by another 1.4%. Resilience was found to significantly decrease the level of COVID anxiety. In Model 4, attachment anxiety and avoidance were added. Attachment anxiety increased the level of COVID anxiety, while attachment avoidance had a decreasing effect. The final explained variance reached 16.7%. In Models 2, 3, and 4, the type of school lost its significance. In the final model, the significant predictors with an acceptable effect size (above the smallest effect size of interest, SESOI, $\beta > 0.10$) were all associated with a decreased level of COVID anxiety: male gender,

higher general and mental health score, and higher resilience and attachment avoidance scores.

6.4 Discussion

The main goal of this paper was to explore the relationships between COVID anxiety and its risk/protective factors. Negative predictors (protective factors) of COVID anxiety were being male, higher resilience and attachment avoidance. On the other hand, higher age, worsened general and mental health, and attachment anxiety were risk factors for COVID anxiety. The effect of other variables in the model were negligible (i.e., bellow our SESOI).

The effect of background characteristics

Mental health problems are in general more prevalent in females than in males (e.g., McLean et al., 2011; Baxter et al., 2014; Salk et al., 2017). Females are more vulnerable to developing psychological symptoms, such as anxiety, after a stressful or traumatic event (Tolin and Foa, 2008). The present findings corroborate girls experiencing higher level of COVID anxiety (e.g., Racine et al., 2021; Evren et al., 2022; Mora-Magaña et al., 2022). We also found that adolescents are more likely to be COVID anxious with increasing age. This is in line with other research that has observed higher mental health symptomatology in outcomes such as anxiety or depression in older adolescents (e.g., Nearchou et al., 2020). Regarding the type of school, higher mental health outcomes were observed in music and art students (e.g., Spahn et al., 2004; Vaag et al., 2021). Based on this fact, we used art school students as a reference group when comparing students in COVID anxiety levels; however, this difference was not significant.

The effect of health

In the context of the pandemic, much research has been done on both mental and physical health (e.g., Lakhan et al., 2020; Cui et al., 2022). Research findings based on longitudinal data have typically suggested that people's mental and physical health worsened during the pandemic. Nonetheless, pre-pandemic levels of mental health should also be taken into consideration (e.g., Cui et al., 2022). Several studies have confirmed that these baseline levels were a strong risk factor for mental health difficulties during the pandemic (Czeisler et al., 2020; McGinty et al., 2020; Fancourt et al., 2021; Shanahan et

al., 2022). For instance, people who reported higher levels of anxiety even before the pandemic experienced a steeper decline in mental health during the pandemic (e.g., Morales et al., 2022). Even though we do not have the pre-pandemic data, our results suggest that general/mental health is a significant predictor of COVID anxiety. This is debatable, however, as general health could be both the cause and a consequence of perceived COVID related anxiety in adolescents.

The effect of resilience

Resilience as the ability to bounce back from a stressful event is very important in coping with stress (Rutter, 2018), especially in pandemic times (e.g., Seaborn et al., 2022). In general, resilience plays a significant role in mental health. Based on current research, it might be a protective factor for anxiety related specifically to COVID-19 (e.g., Barzilay et al., 2020; Skalski et al., 2021), as well as general anxiety, which also applies during times of pandemic (e.g., Taao et al., 2022). Besides the importance of resilience during stressful times, it is also a relevant predictor of subsequent mental health. According to a Chinese study, a higher level of resilience before COVID-19 significantly predicted a decreased level of depression and anxiety after periods of lockdown (Shi et al., 2022). The protective model of resilience was supported by various researchers, who pointed out some factors that are specifically related to better mental health outcomes. According to Askeland et al. (2020), greater goal orientation, self-confidence, social competence, social support and family cohesion are important for maintaining mental health in adolescents. Similarly, a study on the risk and resilience of adolescents during COVID-19 showed that the most robust associations with teens' distress were with feelings of stress around parents and support received from them (Luthar et al., 2021). Similar results were obtained in a meta-analysis focusing on social support and its role in anxiety and other mental health variables in childhood and adolescence (Rueger et al., 2016; Heerde and Hemphill, 2018). Altogether the data suggest that interventions should attend not just to adolescents' mental health but also that of caregiving adults at home and school. There are strong associations between adolescents' reports of prosocial and health-protective behaviors, as well as significant pathways to COVID-19 prosocial health protective behaviors from parent–adolescent attachment security through adolescents' favorable mental health responses to the pandemic (Coulombe and Yates, 2022). Therefore, interventions aimed at boosting these potential protective factors would be beneficial for adolescents (not only) in pandemic times. Promote the well-being of

adolescents (and others) during this difficult crisis should consider the quality of parent–adolescent relationships with fostering adolescent's felt security and safety with attachment-based interventions (review in Mikulincer and Shaver, 2007).

The effect of attachment anxiety and attachment avoidance

Based on our results, attachment anxiety is positively correlated to COVID anxiety. This result is in line with an Italian study, where the relationship between various attachment styles (secure attachment, fearful attachment, dismissing attachment and preoccupied attachment) and COVID anxiety was explored. Fearful and preoccupied attachment were significant positive predictors of COVID anxiety. This could be explained by the fact that people with higher attachment anxiety may tend to be more preoccupied about the pandemic and its related restrictions, which could lead to higher anxiety related to the COVID. In accordance with other research findings, attachment avoidance in our study was negatively correlated with the COVID anxiety (e.g., Moccia et al., 2020; Vismara et al., 2022). This relationship may be explained by the fact that avoidantly attached individuals, who tend to be self-directed and may exhibit less distress in social isolation, may have perceived the pandemic and restrictions as less stressful (in comparison with anxiously attached individuals). On the other hand, even in avoidantly attached people, social distancing and possible long-lasting loneliness related to pandemic restrictions might have an impact on mental health (e.g., Vismara et al., 2022). Based on available studies showing associations between attachment and the psychological impact of the pandemic (e.g., Moccia et al., 2020; Coulombe and Yates, 2022; Vismara et al., 2022), we can assume that secure attachment may play a key role in protection before the emergence of mental health disorders in challenging pandemics times. Securely attached people face stressful events relying on both others' support and their own self-confidence; they have the capacity to mitigate loneliness, which reduces potential anxiety and mental health problems.

Adolescence is an especially sensitive period for brain development (Fuhrmann et al., 2015). Bio-psycho-social stressors related to the pandemic may have an impact on mental health due to neuro-immuno-endocrinological changes induces by stress (de Figueiredo et al., 2021). Since socialization and relationships are in general very important for people in this age, the social isolation and potential long-term feeling of loneliness may be important sources of distress. The rapid systematic review of studies from various pandemics (Loades et al., 2020) showed that the length of loneliness due to

pandemic restrictions in particular appears to be a predictor for future mental health. This could be taken into consideration when planning pandemic restriction rules for schools, and children and adolescents should be prevented from taking part in long periods of social distancing.

Based on fact that in adolescence peer relationships begin to increasingly take on critical attachment functions (Allen and Tan, 2016) and the security in peer attachment relationships is related to youths' feeling of connection (Parent et al., 2021), it is also important to focus on peer attachment relationships, because they can serve as an important source of social support, intimacy and strength and serve as a protective factor in situations of chronic stress during a pandemic. Simultaneously, it is important to aim to improve resilience, for example, by using a mindfulness training program (Yuan, 2021) or promoting active coping skills.

Limits and perspectives for future research

The present study has several limitations. The first regards the collected variables. The participants were not asked about any psychiatric diagnosis in their history or their mental health difficulties before the pandemic. They were also not asked if they are/were positive for COVID-19, which could have potentially affected their mental health. In both cases, the information could have helped us describe the anxiety related to COVID-19 more properly. Because our study design is cross sectional and we do not have pre-pandemic data from the same population, we cannot explore causality.

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KAPITOLA 7

Perceived Stress, COVID-19 stressors, loneliness, and resilience of university students after the strictest lockdown

Bibiána Jozefiaková, Natália Kaščáková, Jozef Hašto, Peter Tavel

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Abstract

The study explored the impact of perceived stress, stressors related to COVID-19, loneliness, and resilience on the mental health of university students after the strictest lockdown. Our additional goal was to compare this data (N = 2107, mean age = 22.73, SD = 3.77) with pre-pandemic young people's data from a representative sample (N = 213, mean age = 23.99, SD = 4). To address these variables Brief Resilience Scale, Brief Symptom Inventory, Perceived Stress Scale, and adapted version of the Covid iStress survey were used. The data were analyzed using hierarchical OLS regression models. The most significant predictors of mental health indicators were perceived stress, loneliness, and resilience. However, the sum score of Covid-related stressors did not significantly increase explained variance. Specific Covid-related stressors, such as pandemic-induced loneliness, worsened relationships, and worries about infection, had notable effects on depression, anxiety, and Global Severity Index. Compared to the pre-pandemic data, the university students had significantly worse scores in all three mental health indicators.

Keywords: mental health, university students, Covid-19, Covid related stressors, pandemic

7.1 Introduction

The outbreak of the Covid-19 pandemic, with its widespread impact on society, has had a profound impact on mental health worldwide. Based on the data from World Health Organisation (WHO), the prevalence of anxiety and depression increased by 25% during the first year of the pandemic (World Health Organization, 2022). As the pandemic

has been accompanied by severe restrictions, mainly related to social distancing, it has changed the way society operated in almost all areas of life, including education. Most universities/courses have switched to online learning, which has proved to be a burden on students' mental health and well-being (Dhar et al., 2020). The loss of social contact and subsequent intense feelings of loneliness emerged as crucial factors (e.g., Visser z Law-van Wyk, 2021; Park et al., 2020) because of the associated loss of social contact (e.g., Visser & Law-van Wyk, 2021) and subsequent intense feelings of loneliness (Park et al., 2020).

Even before the pandemic, researchers have been pointing out that university students are a vulnerable group that experiences anxiety and depressive symptoms relatively often (Holm-Hadulla & Koutsoukou-Argyraki, 2015; Macaskill, 2013). The situation became even more concerning during the Covid-19 pandemic, as evidence from Slovakia indicated a two-fold increase in the prevalence of moderate-to-severe symptoms of depression and anxiety (34.3% and 20.1% respectively, e.g., Hajduk et al., 2022). Several risk factors, such as (1) gender (women reported more significant mental health problems), (2) loss of income, (3) housing conditions, (4) mental health history, (5) physical activity levels, (6) social support (e.g., inability to spend lockdown with family or low quality of social relationships and social support in general), (7) availability and communication of information regarding the anti-pandemic measures, and (8) loss of daily and study routine, contributed to the escalation of mental health problems (Woon et al., 2021). The perceived stress level also emerged as a critical factor in the development of mental health difficulties during the pandemic (e.g., Nochaiwong et al., 2021). However, there were indications that resilience, as the ability to recover from stressful events, might serve as a protective factor for mental health during this challenging time (Wu et al., 2020). On the other hand, some researchers observed a slight decrease in perceived stress and mental health difficulties during the later waves of the pandemic (Rogowska et al., 2021; Robinson et al., 2022). Nevertheless, given the significant impact of the pandemic on mental health, it remains crucial to explore the risk and protective factors, particularly among university students.

Therefore, the present study aims to investigate the associations between mental health (depression and anxiety), perceived stress, Covid-10 related stressors, resilience, and loneliness among university students following the strictest lockdown.

7.2 Methods

7.2.1 Participants and data collection

The data was collected online from 31st of May to 17th of June 2021 in collaboration with the Slovak Council for Higher Education. A total sample of 2107 university students (age 18-62 years, mean age = 22.73, SD = 3.77) was recruited. About 63% of our research sample were women. More information about the demographic characteristics of the sample is available in Table 1. More detailed description of the chronology of the pandemic situation can be found at https://osf.io/vjmfd/ (Vargova et al., 2022). The comparison group of young adults (N = 213, age 18-30 years, mean age = 23.99, SD = 4) was a subset from the representative sample (based on quota characteristics for gender, age, education, nationality, size of place of living, and region) of Slovak inhabitants collected in April 2019. Respondents were informed about the aim of the study and agreed to participate. Both data collections follow the Helsinki Declaration. The study was reviewed and approved by the Ethical Scientific Committee of Palacky University Olomouc (no. 2019/05, and no. 2021/10).

Table 7.1 Demographic characteristics of the university students sample (N=2107)

	University students	
	N	%
Gender (female)	1332	63.21
Marital status		
Single	1715	81.39
Living with a partner	310	14.71
Married	72	3.41
Divorced	10	0.47
Study form		
Bachelor’s degree	1478	70.1
Master's degree	527	25.0
PhD.	59	2.8
Continuous study (medicine, pharmacy, theology)	43	2.0
Full-time	1997	94.8
External	110	5.2

7.2.2 Measures

The mental health outcomes were measured using the Brief Symptom Inventory (BSI-53, Derogatis & Melisaratos, 1983). BSI-53 consists of 53 items covering 9 symptom dimensions: (1) somatization, (2) obsession-compulsion, (3) interpersonal sensitivity, (4) depression, (5) anxiety, (6) hostility, (7) phobic anxiety, (8) paranoid ideation and (9) psychoticism. The Global Severity Index (GSI) combines information

about the number of symptoms and the intensity of the respondent's overall level of distress. It was used as a proxy of the severity of mental health state. Items of this questionnaire are rated on 5-point scale from (0) "not at all" to (4) "extremely".Stress was measured by the Perceived Stress Scale (PSS, Cohen et al., 1983). PSS consists of 10 items which are rated on 5-pont scale from (0) "never" to (4) "very often". For the COVID-related stress an adapted version of the COVIDiStress survey (Lieberoth et al., 2021; the questionnaire is available at supplementary materials https://osf.io/4u5eh/?view_only=963c12a8afcb4ab9b04464a8d849e92e) was used. The Brief Resilience Scale (BRS, Smith et al., 2008; Furstova et al., 2021) was used as the measure of participants' resilience. This questionnaire consists of 6 statements and respondents indicate on scale from (1) "strongly disagree" to (5) "strongly agree". A single-item measure of loneliness (i.e., how lonely have you felt during the last year?) was utilized. All the measures were adapted to Slovak using the back-translation method and piloted. Descriptive statistics, reliabilities, and bivariate correlations are available in Table 7.2.

Table 7.2 Descriptive statistics, reliabilities of the measures, and bivariate correlations

	1	2	3	4	5	6	7	8	9	10
1 Gender	-	-	-	-	-	-	-	-	-	-
2 Age	-.01	-	-	-	-	-	-	-	-	-
3 Study form	-.06***	.56***	-	-	-	-	-	-	-	-
4 Perceived stress	-.16***	-.13***	-.07*	-	-	-	-	-	-	-
5 Depression	-.05	-.13***	-.07*	-	-	-	-	-	-	-
6 Anxiety	-.17***	-.10***	-.08**	.69***	.74***	-	-	-	-	-
7 GSI	-.13***	-.13***	-.09**	.72***	.89***	.88***	-	-	-	-
8 Loneliness	.03	-.15***	-.12***	.49***	.63***	.41***	.53***	-	-	-
9 COVID-stress	-.13***	.04	-0.07*	.55***	.53***	.50***	.55***	.51***	-	-
10 Resilience	.21***	.08**	.06	-.53***	-.50***	-.55***	-.55***	-.30***	-.34***	-
M	1.37	22.68	1.05	33.52	2.76	2.62	2.40	3.49	3.85	2.90
SD	0.50	3.69	0.22	7.53	1.13	1.06	0.82	1.35	1.07	0.83
ωtotal	-	-	-	.88	.92	.92	.98	-	.90	.88

Note: GSI = Global Severity Index, Pearson correlation coefficients are reported. * $p<0.05$; ** $p<0.01$; *** $p<0.001$

7.2.3 Statistical analysis

The data were initially screened for careless participants. Based on Mahalanobis distance and longstrings, we considered 144 participants as careless and excluded them from further analyses. Afterward, the reliabilities of the measures/subscales were calculated using the omega total coefficient, and given their sufficient values, the sum scores for the scales were computed. The correlations matrix and other supplementary materials are available at https://osf.io/4u5eh/?view_only=963c12a8afcb4ab9b04464a8d849e92e.

For the main analysis, several hierarchical OLS (Ordinary Least Squares) regression models (with psychological variables being standardized to z-scores) were estimated. Depression, anxiety, and Global Severity Index were treated as dependent variables, while sociodemographic variables, perceived stress, loneliness, resilience, and COVID-related stress were modelled as predictors. The predictors were divided into blocks to examine the change in the explained variance of the dependent variables. The first block (model 1) included sociodemographic variables (gender, age, study form). In the second block (model 2), a summary score of perceived stress was added. Loneliness score was added into the third block (model 3). The fourth block also contained the resilience score (model 4). The final fifth block (model 5) involved a summary score of COVID-related stress. The results for each regression model are presented in Tables 3-5. We set the smallest size of interest (point estimate) to $\beta = .10$.

To explore the effects of the specific COVID-related stressors on mental health outcomes, we computed the fifth block also alternatively - the block included all the stressors as separate variables. Here, we report only a summary of these findings, but all the outputs are available in supplementary materials.

7.3 Results

Depression. The sociodemographic variables explained 2% of the variance of depression. After adding the score of perceived stress, the R2 increased to 48%. Loneliness explained an additional 11% of the depression's variance. After adding the resilience score, the R2 increased to 61%. However, the addition of the COVID-related stress sum score did not increase the explained variance (R2 change = 0%) Out of the specific COVID-related stressors, only loneliness caused by the pandemic ($\beta = 0.19$), had the effect greater than our SESOI (smallest effect size of interest) of .10.

Anxiety. The sociodemographic variables explained 4% of anxiety's variance. The greatest increase was observed for the perceived stress score (explained 48% of the variance). Loneliness and resilience explained further 1% and 4% of the variance, respectively. The sum score of COVID-related stressors explained 1% of the variance. From the specific COVID-related, only loneliness caused by the pandemic (β = 0.11) and worries about getting infected (β = 0.10) had effect at least equal to our SESOI.

Global Severity Index (GSI). Sociodemographic variables explained 3% of the GSI's variance. Perceived stress explained further 49% of the variance. After the inclusion of loneliness, the percentage of explained variance increased by 4%. Resilience explained additional 3% of the GSI's variance, while the COVID-related stress increased the explained variance by 1%. Out of the specific items, only worsened relationships with people from the household (β = 0.10) yielded effect as high as the SESOI.

Table 7.3 The results of linear regression for the depression

Predictor	Model1	Model2	Model3	Model4	Model5
Depression					
Gender	**-0.12 (.007)**	**0.11 (.001)**	0.03 (.341)	0.07 (.014)	**0.08 (.003)**
Age	**-0.03 (<.001)**	-0.00 (.452)	0.00 (.739)	0.00 (.778)	-0.00 (.843)
Study form	-0.20 (.087)	-0.16 (.056)	-0.08 (.297)	-0.06 (.392)	-0.04 (.551)
Stress	-	**0.70 (<.001)**	**0.51 (<.001)**	**0.44 (<.001)**	**0.41 (<.001)**
Loneliness	-	-	**0.38 (<.001)**	**0.36 (<.001)**	**0.33 (<.001)**
Resilience	-	-	-	**-0.15 (<.001)**	**-0.15 (<.001)**
Covid related stress	-	-	-	-	**0.09 (<.001)**
R2	0.02	0.48	0.59	0.61	0.61
R2 change	-	0.46	0.11	0.02	0

Note: standardized regression coefficients are present, the corresponding p-values are in parenthesis

Table 7.4. The results of linear regression for the anxiety

Predictor	Model1	Model2	Model3	Model4	Model5
Anxiety					
Gender	**-0.34 (<.001)**	**-0.13 (<.001)**	-0.16 (<.001)	-0.09 (.004)	**-0.07 (.022)**
Age	**-0.02 (.010)**	0.00 (.340)	0.00 (.172)	0.01 (.181)	0.00 (.470)
Study form	-0.26(.027)	-0.22 (.010)	-0.18 (.025)	-0.16 (.042)	-0.14 (.088)
Stress	-	**0.68 (<.001)**	**0.61 (<.001)**	**0.50 (<.001)**	**0.45 (<.001)**
Loneliness	-	-	**0.14 (<.001)**	**0.12 (<.001)**	**0.07 (<.001)**
Resilience	-	-	-	**-0.24 (<.001)**	**-0.23 (<.001)**
Covid related stress	-	-	-	-	**0.13 (<.001)**
R2	0.04	0.48	0.49	0.53	0.54
R2 change	-	0.44	0.01	0.04	0.01

Note: standardized regression coefficients are present, the corresponding p-values are in parenthesis

Table 7.5 The results of linear regression for the Global Severity Index (GSI)

Predictor	Model1	Model2	Model3	Model4	Model5
Global Severity Index					
Gender	**-0.26 (<.001)**	**-0.04 (.247)**	-0.09 (.004)	-0.03 (.322)	**-0.01 (.839)**
Age	**-0.03 (<.001)**	-0.00 (.228)	-0.00 (.782)	-0.00 (.716)	-0.01 (.232)
Study form	-0.18(.13)	-0.14 (.095)	-0.08 (.285)	-0.06 (.405)	-0.03 (.696)
Stress	-	**0.71 (<.001)**	**0.59 (<.001)**	**0.50 (<.001)**	**0.44 (<.001)**
Loneliness	-	-	**0.24 (<.001)**	**0.22 (<.001)**	**0.16 (<.001)**
Resilience	-	-	-	**-0.21 (<.001)**	**-0.20 (<.001)**
Covid related stress	-	-	-	-	**0.16 (<.001)**
R2	0.03	0.52	0.56	0.59	0.60
R2 change	-	0.49	0.04	0.03	0.01

Note: standardized regression coefficients are present, the corresponding p-values are in parenthesis

7.4. Discussion

Our study aimed to explore the impact of (1) perceived stress level, (2) stressors related to the COVID-19 pandemic, (3) loneliness, and (4) resilience on the mental health of university students In line with previous studies, perceived stress (Huebschmann & Sheets, 2020), loneliness (Park et al., 2020), and resilience (Wu et al., 2020) were significant predictors of mental health outcomes.

The effect of sociodemographic variables

Gender significantly predicted mental health, especially in the case of depression and anxiety, however, obtained effects were below our SESOI. Although our main goal was not to focus on gender differences in mental health, we consider it important to emphasize this result. The gender differences in mental disorders are among the most stable findings in psychiatry, with a higher prevalence of mood and anxiety disorders observed in women (e.g., Boyd et al., 2015), which is relevant also for the pandemic context (e.g., Vloo et al., 2021).

The effect of Perceived Stress

Perceived stress has long been considered a significant predictor of mental health difficulties (Schneidermann et al., 2005). The level of perceived stress typically increases by uncertainty, or unexpected and unpredictable factors, such as a pandemic (e.g., Cooke et al., 2020). People who experience higher levels of stress tend to report more significant symptoms of depression and anxiety (Cristóbal-Narváez, 2020). According to Li et al., (2022) perceived stress might be an important mediator that explains the relationship between the Covid-19 pandemic and mental health. In the German study students who rated the impact of COVID-19 as high, had higher levels of stress, anxiety, and depression (Voltmer et al., 2021). In the current study, stressors related specifically to the COVID-19 pandemic explained a smaller percentage of the variance for anxiety compared to the general stress and pre-existing mental health symptoms.

The effect of loneliness

As humans are social beings, social integration and relationships in general are crucial for emotional fulfilment and well-being. However, loneliness may be related to the objectively quantified social isolation, which is not the same thing. Loneliness is more a subjectively experienced feeling of not belonging to someone (Mann et al., 2022). It tends to be higher during adolescence with decreasing tendency during middle adulthood and increasing for late adulthood (Lasgaard et al., 2016). In line with our findings, loneliness has been associated with mental health difficulties (Heinrich & Gullone, 2006), and with somatic difficulties (Heinrich & Gullone, 2006; Park et al., 2020). Based on current research the odds of developing depression are more than double in people who feel lonely often (e.g., Mann et al., 2022).

The effect of resilience

While perceived stress and loneliness can be considered as risk factors for the development of mental health difficulties, resilience may play a protective role. Our results are thus in line with previous research that has highlighted the negative relationship between resilience and mental health outcomes (e.g., Konaszewski et al., 2021). Resilience seems to protect against the negative impact of stressful or even traumatic life events and so contributes to better mental health (Davydov et al., 2010), however, some authors argue that lower resilience scores are related to higher perceived stress, chronic stress as well as psychopathology (e.g., Garcia-León et al., 2019). In stressful pandemic times, resilience might be especially important for mental health. Based on longitudinal data, mental distress varied during the first months of the COVID-19 pandemic by resilience levels, with low-resilient adults reporting the biggest increase in mental distress during the time (e.g., Riehm et al., 2021).

The effect of Covid-related stressors

Surprisingly, the summary score of the COVID-related stress explained almost no additional variance in mental health outcomes after accounting for the general perception of stress, loneliness, and resilience (see Models 5). When using each one of the Covid-related stressors as an individual predictor of depression, the only significant predictor associated with the COVID-19 pandemic was loneliness, which is directly associated with social isolation (Killgore et al., 2020). A cross-cohort comparative study revealed that being a student emerged as a higher risk factor during lockdown for loneliness (e.g., Werner et al., 2021). Loneliness experienced during the pandemic was strongly associated with depression, anxiety, and somatic complaints (e.g., Li et al., 2021). In the present study, loneliness related to the pandemic and worries about getting infected were significant predictors of anxiety. In the case of the Global Severity Index the only significant predictor related to the pandemic was difficulties in relationships with people from the same household. Family relationships are a strong predictor of psychological distress and psychological difficulties, especially in situations of long-term stay home orders/recommendations (Li et al., 2021). Social support from family and friends may be an important factor in coping with the negative impact of stressors during a pandemic (Li et al., 2021; Woon et al., 2021).

According to a WHO survey, up to 75% of mental health disorders are first observed in early adulthood (e.g., Auerbach et al., 2018). Although longitudinal studies

suggest that the deterioration of mental health of university students has peaked during the pandemic and the situation is gradually returning to the pre-pandemic conditions (Robinson et al., 2022), researchers have pointed to an increase in levels of depressive and anxiety symptoms in university students even before the pandemic (e.g., Holm-Hadulla & Koutsoukou-Argyraki, 2015). It is important to consider that (1) approximately 16-27% of students showed signs of depression and 9-21% of anxiety even before the pandemic (e.g., Hajduk et al., 2019; Puthran et al., 2016) and (2) our results suggest that the general level of stress, loneliness, and resilience might play even more significant role than the difficulties related specifically to COVID-19. In the light of the findings from our study, it is important to consider the broader implications of the COVID-19 pandemic on the mental health trajectory of university students. In the short term, the immediate aftermath of the strictest lockdown has manifested in heightened perceived stress, exacerbated feeling of loneliness, and discernible impact on students' resilience. Altogether, these factors have contributed to a deterioration in mental health indicators (depression, anxiety, and the global severity) aligning with other research findings (Chen & Lucock, 2022). Looking towards the long term, the enduring effects of these stressors pose a substantial risk for the development of chronic mental health difficulties. Pandemic has not only disrupted the academic life of university students but also has the potential to influence future mental health and well-being of this vulnerable population (Schwartz et al., 2022).

Although the available evidence suggests that the stress reported by university students is attributed to the pandemic, to the best of our knowledge, none of the studies focused specifically on COVID-related stressors. That is, they usually measured the general levels of, for example, perceived stress, which might reflect the pandemic situation only indirectly. Although the bivariate correlations between each of the dependent variables and the COVID-related stressors (and their summary score) are relatively high (see Table 2), after the inclusion of the general perceived stress, loneliness, and resilience (i.e., constructs that are not directly associated with the pandemic), their effect has decreased. The results, therefore, suggest that for mental health outcomes (depression, anxiety, Global Severity Index), general levels of perceived stress, resilience, and loneliness play a more important role compared to the stressors specifically associated with the pandemic. It is worth noting that mental health (disorders) is a continuous spectrum between health and pathology as described, for instance, in the Diagnostic and Statistical Manual of Mental disorders. For example, the phenomena of

fear, anxiety, or avoidant behaviour may be both a part of a syndrome or it may meet the criteria for some form of anxiety disorder. In clinical practice and prevention, it may be therefore important to take into consideration symptoms below the diagnostic threshold.

Limits and perspectives for future research

The study contributes to a better understanding of the actual topic related to the COVID-19 pandemic on university students, a group that, according to the available evidence, has been significantly affected by the pandemic. Although our study has an exploratory character, the present results contribute to the discussion about the mental health of university students and could lead to practical implications for policy-making. These implications may include providing students with easy access to counseling and support, achieved through the development of specialized mental health services within universities, and the establishment of peer support and/or mentorship programs. Additionally, there is a need to emphasize stress management, resilience, and emotional well-being for students.Nonetheless, our study does have several limitations. Data were collected using convenience sampling which might increase the possibility of self-selection bias in the case of university students. For this reason, students who were experiencing psychological distress at the time of the pandemic and wanted to share their experiences could be more prevalent in our sample. Another limitation is the absence of pre-pandemic data specific to university students in Slovakia. Moreover, the study lacks information on whether students enrolled in the study have overcome the COVID infection that could have potentially deteriorated their mental health. Future research should consider these limitations to future enhance our understanding of this critical issue.

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KAPITOLA 8

How stable is resilience?

Bibiána Jozefiaková, Matúš Adamkovič, Jozef Hašto, Peter Tavel, Natália Kaščáková

submitted

Abstract

The study explored trajectory and changes in resilience development over 5 time points between years 2020-2023 on a representative sample of Slovak adults (N= 1342-1949 (overall 3680 individuals (54.3% female) participated at least in one of the present waves of data collection, mean age = 40.77, SD= 14.67). Years marked by several significant stressful factors such as pandemic, the war in Ukraine, and development of the ecological crisis. Furthermore, the dynamics of resilience was tested across multiple subgroups based on gender, age, partner status, and traumatic event experience. Brief Resilience Scale was used to measure resilience (omega total ranging from .86 to .95). The data were analysed using growth curve model. Changes in resilience levels over time were minimal (overall resilience decreased by 0.7%). However, we observed significant variance in resilience and in its change over time. Among individuals with higher average resilience scores at the beginning of the measurements, a more pronounces decrease in resilience was observed across time periods – a significant decline. Men, individuals over 30 years old, and those in a partnership had higher average resilience scores over time.

Key words: resilience, longitudinal design,

8.1 Introduction

Resilience, defined as the ability to bounce back from adversity (Smith et al., 2008), has become a focal point in psychological research. Its growing significance is underscored by the potential implications for mental health interventions and policy development. Studying resilience through a longitudinal lens advances our understanding of its dynamics, which is particularly important for two main reasons. Firstly, resilience is inherently a process that unfolds across various life stages. Secondly, it is assumed to be not a static trait but a malleable characteristic that may be influenced by a multitude of factors (e.g., Wu et al., 2013). Longitudinal methods enable the identification of key

determinants and modifiers of resilience over time, shedding light on the complex interplay between individual differences, environmental influences, and the cumulative impact of events.

Resilience is likely to manifest differently across diverse demographic groups and in response to varying stressors. Extant literature suggests the existence of gender differences in the manifestation of resilience, with some studies positing that females may exhibit lower levels of resilience than males (Sardella et al., 2022; Yalcin-Siedentopf et al., 2021; Lasota et al., 2020). However, the enduring nature of these gender differences over time is an open question, with limited longitudinal studies specifically addressing how resilience unfolds across the lifespan in a gender-specific manner.

Partner status, often neglected in resilience research, might play an important role in resilience development. The presence or absence of a (supportive) partner is acknowledged as a significant determinant of one's ability to navigate and recover from adversity (Peng et al., 2022; Weitzel et al., 2022, Górska et al., 2022). Longitudinal examination of resilience within the context of partnership status aims to unravel the role of social support networks in shaping resilience trajectories over time (e.g., Ozbay et al., 2007; Chang et al., 2023).

Trauma, defined as exposure to an event involving actual or threatened death, serious injury, or sexual violence (American Psychiatric Association, 2013), can have profound and lasting impacts on individuals' mental health. Resilience is deemed a strong protective factor against the development of mental health difficulties and is a fundamental element for psychological adaptation (e.g., Mizuno et al., 2016). The results of a meta-analysis examining the relationship between resilience and mental health (Hu et al., 2015) suggest that people with lower levels of resilience are more likely to exhibit mood and anxiety disorders. Further research shows that a low level of resilience may be associated with a traumatic experience, especially childhood trauma (emotional abuse and emotional neglect; Park et al., 2023). Understanding the relationship between trauma and resilience is crucial for identifying strategies to support those who have experienced traumatic events.

To address the lack of empirical evidence on resilience development over time, the present study aims to utilize a longitudinal design and explore its trajectory and changes on a representative sample of the Slovak population. The measurements were conducted at 5 time points between years 2020-2023, during years marked by several significant stressful factors – the pandemic, the was in Ukraine, and the development of

the ecological crisis. Furthermore, the dynamics of resilience will be tested across multiple subgroups based on gender, age, partner status, and traumatic event experience.

8.2 Methods

8.2.1 Participants and data collection

This study utilizes a subset of data from a longitudinal investigation of the mental health of Slovak inhabitants in the context of the pandemic (project APVV-20-0319). The present data concerns seven waves of data collection, spanning from August 2020 to December 2023, in which the measure of resilience was available. The ethics approval was granted by the ethics committee at the Centre of Social and Psychological Sciences, Slovak Academy of Sciences. Prior to each data collection, informed consent was secured from participants. Overall, 3680 individuals (54.3% female) participated at least in one of the present waves of data collection. The mean age of the participants (approximated to correspond with Time 1) was 40.77 years (SD = 14.67). About two thirds (66.1%) of the participants indicated having a partner in the majority of the data collection waves they participated in. Approximately 60.8% of the participants indicated that they experienced at least one traumatic event. Details regarding the sample's demographic characteristics, accompanied with the overlap of participants across different collection waves, are summarized in Table 1. The percentage of missing data, for the individuals who participated in a specific wave, varied from 0.1 to 7.7%. Further insights into the study's design and sampling methodology can be accessed at https://osf.io/32rsx. Details on the course of the pandemic situation in Slovakia is available at https://osf.io/vjmfd.

Table 8.1 Demographic characteristics and between-waves overlap

	N	Age (SD)	% female	Overlap (N and %) between waves						
				T1	T2	T3	T4	T5	T6	T7
Time 1 (Aug 2020)	1743	41.5 (12.8)	51.2	-	88.3	88	38.4	42.3	47.1	43.1
Time 2 (Oct 2020)	1524	42.9 (12.9)	51.7	1346	-	95.2	39.4	43.9	46.9	43.6
Time 3 (Dec 2020)	1342	43.4 (12.8)	51.9	1181	1278	-	37.5	41.7	44.8	41.5
Time 4 (Mar 2022)	1830	44.3 (15.1)	53.7	701	721	686	-	67.4	65.9	58.8
Time 5 (July 2022)	1800	44.3 (15.3)	51.7	762	791	750	1213	-	70.5	63
Time 6 (Apr 2023)	1851	46.2 (14.9)	52.9	872	868	829	1220	1305	-	72.6
Time 7 (Dec 2023)	1949	46.6 (14.9)	55.8	840	850	808	1146	1227	1415	-

Table 8.2 Anti-pandemic measures and the pandemic situation in Slovakia

	Anti-pandemic measures and situation related to the COVID-19 pandemic in Slovakia
August 2020	The situation was stabilized, however, in the Mid-August was the beginning of the second wave of COVID-19
October 2020	An emergency state was announced, and additional or stricter measures were introduced, all schools switched to distance learning, a pilot mass antigen testing was done, a lockdown was imposed (with exceptions to travelling to work, travelling for COVID-19 testing, leaving home for essential shopping, and going into nature)
December 2020	the epidemic situation began to worsen significantly, another lockdown was imposed. Vaccination has started 26th of December, the number of hospitalized patients has almost reached the limits of hospitals.
March 2022	in late March and early April, the pandemic wave reached its peak, at the end of March, the total number of positive cases in Slovakia since the beginning of the pandemic reached 1 700 000
July 2022	The situation remains stable.
April - December 2023	The situation remains stable.

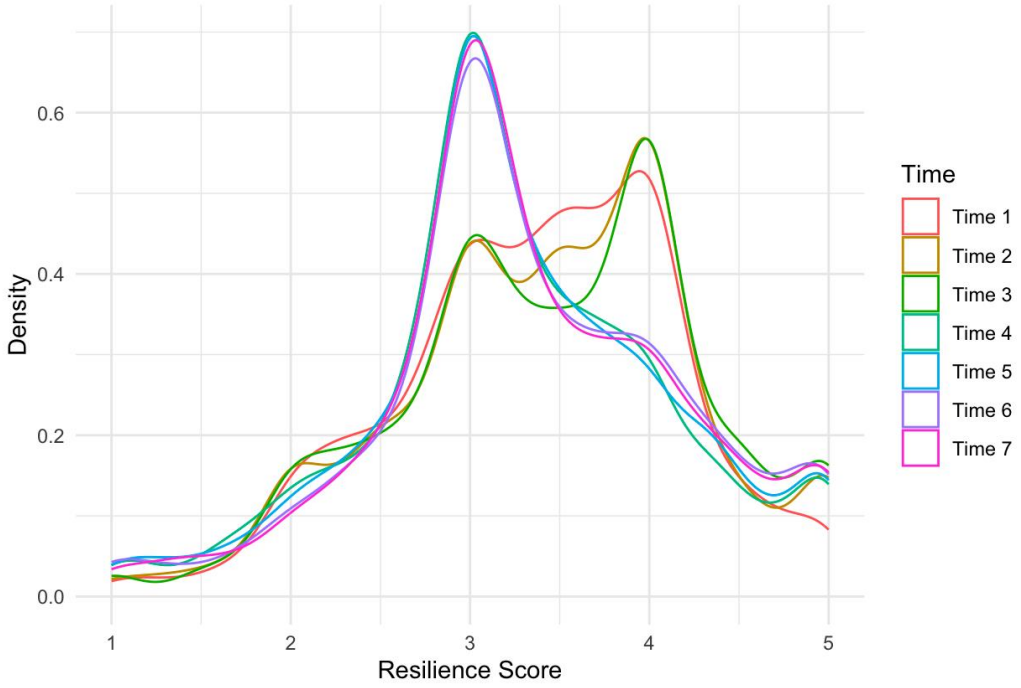
8.2.2 Measures

Resilience was measured using the Brief Resilience Scale (BRS; Smith et al., 2008; adapted to Slovak language by Furstova et al., 2021). This questionnaire consists of six items on a 5-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree". The BRS measures resilience as the ability to recover from a stressful event. The reliability of the scale across the data collection waves was high, with omega total coefficients ranging from .86 to .95 Descriptive statistics are available in Table 3, while Figure 1 depicts density plot of resilience scores.

Table 8.3 Resilience score over time

Time	M	SD	Skew	Kurt	Bivariate correlations and omega total (on diagonal)						
					T1	T2	T3	T4	T5	T6	T7
T1	3.38	0.79	-0.33	-0.09	*.88*	-	-	-	-	-	-
T2	3.42	0.84	-0.32	-0.15	.63	*.86*	-	-	-	-	-
T3	3.45	0.86	-0.30	-0.27	.61	.62	*.88*	-	-	-	-
T4	3.26	0.84	-0.06	0.09	.58	.61	.53	*.85*	-	-	-
T5	3.28	0.85	-0.08	0.04	.59	.61	.57	.67	*.83*	-	-
T6	3.34	0.86	-0.13	0.05	.55	.59	.57	.62	.63	*.85*	-
T7	3.33	0.85	-0.07	0.04	.54	.57	.56	.62	.67	.67	*.87*

Figure 8.1 Density plot of resilience scores over time



8.2.3 Statistical analysis

The data were already cleaned from careless response patterns and improbable values. This cleaning was based on a combination of short response time, failed attention checks, Mahalanobis distance, and longstrings. The reliability of resilience across each time point was estimated using omega total coefficients based on polychoric correlations. Resilience mean scores were computed, and bivariate correlations across time points were checked. For the subgroup analyses, subgroups were created as follows. For each individual, an approximate age at Time 1 was computed and three categories – under 30, 31 to 49, 50 and more – were created. Partner status was based on the mode of participant's available responses. If there were two modes for a participant, we categorized the participant into the "in relationship" group. If a participant answered positively on any item of the modified SLESQ questionnaire, they were categorized in the "traumatic event" group.

To examine the stability of resilience over time, growth curve models and repeated measures ANOVAs were estimated. The growth curve models were computed using the MLR estimator and full information maximum likelihood (FIML) was used to handle missing data. A particular interest was paid to slopes and their variance (i.e., the average rate of change over time across individuals and its variability) and intercept-slope

covariance (i.e., the relationship between the initial status and the rate of change). Fit of each model was assessed using the χ^2 test statistics (see Ropovik, 2015) and approximate fit indices (CFI, TLI, RMSEA, and SRMR; see Hu & Bentler, 1999).

In the repeated measures ANOVAs, time was modeled as the fixed effect and individual participants were treated as random effects. The computations were complemented with marginal means estimation and their pairwise comparisons across the time points. The p-values were adjusted using the Bonferroni multiple-comparison correction. For each comparison, effect size in the form of Cohen's d was also computed.

The analyses were performed in R, using lme4 (Bates et al., 2015), emmeans (Lenth et al., 2023), and lavaan (Rosseel, 2012) as the main packages. The data and analytic script are available at osf.io/zucse/.

8.3 Results

The resilience scores ranged from 3.26 to 3.45, with 3.38 being the baseline score and 3.35 being the score in the last wave of data collection. The resilience scores were highly correlated across time points (rs = .54 - .67). Naturally, the correlations tended to decrease with the distance between the time points.

The growth curve model had a very good fit with $\chi^2(23) = 120.41$, $p < .001$; CFI = .98; TLI = .98; RMSEA = .03 (95% CI [.03, .04]); SRMR = .04. The parameter estimates showed a significant variation in the baseline resilience score (intercept variance = .447; $p < .001$). Overall, a minor, yet significant decline in resilience was observed over time (slope = -.01, $p = .031$). There was a significant variability in the rate of change over time among individuals (slope variance = .01; $p < .001$). The intercept-slope correlation (-.01, $p < .001$) indicates higher initial status to be associated with a slightly more rapid decrease in the resilience trajectory.

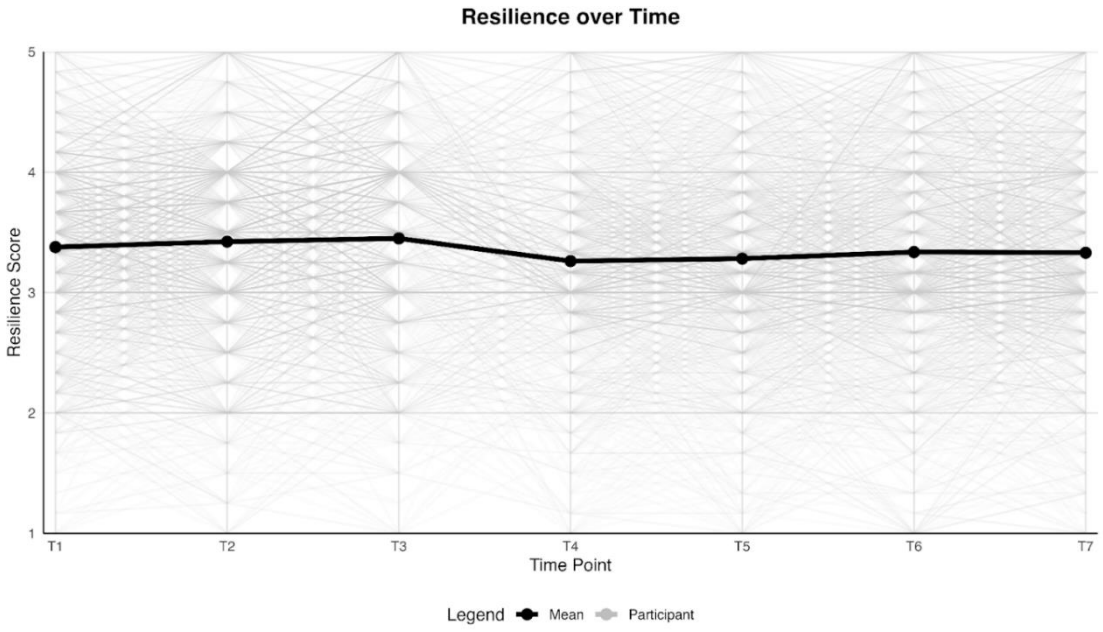
In the repeated measures ANOVA, the variance attributed to the random intercept for participants was 0.43. The type II Wald's chi-square test ($\chi^2(6) = 86.68$ $p < .001$) indicates significant differences in the mean scores across the time points. The post-hoc tests of the marginal means showed significant differences in 13 out of 21 comparisons between time points. The absolute values of standardized effect sizes ranged from Cohen's d = 0.01 to 0.22. The results are summarized in Table 4. The individual trajectories as well as the average time trend are plotted in Figure 2.

Table 8.4 Post-hoc comparisons of the marginal means and Cohen's ds

	T1	T2	T3	T4	T5	T6	T7
T1	-	-0.06	-0.09	0.14	0.12	0.05	0.06
T2	-0.03	-	-0.03	0.19	0.17	0.10	0.11
T3	-0.07**	-0.04	-	0.22	0.20	0.13	0.14
T4	0.09***	0.13***	0.17***	-	-0.02	-0.09	-0.08
T5	0.08**	0.11***	0.15***	-0.01	-	-0.06	-0.06
T6	0.02	0.06	0.10***	-0.07**	-0.06*	-	0.01
T7	0.02	0.05	0.09***	-0.08***	-0.06*	-0.01	-

Note: Marginal means are below diagonal, * = p < .05, ** p < .01, *** = p < .001; Cohen's ds are above diagonal

Figure 8.2 Individual participant trends and the average trend in the resilience score



The same analytic pipeline was carried out for each subgroup. The differences in the baseline resilience scores (d_{gender} = 0.37; $d_{ageCategories}$ = -0.18 / -0.21 / -0.03; $d_{partnerStatus}$ = -0.09; d_{trauma} = 0.10), were similar to average differences across the time points (d_{gender} = 0.36; $d_{ageCategories}$ = -0.15 / -0.21 / -0.07; $d_{partnerStatus}$ = -0.09; d_{trauma} = -0.00). However,

there were minor variations in subgroup slopes, ranging between -0.01 and 0.00. Similar results were observed for intercept-slope covariance, with estimates ranging between -0.02 and -0.01. We further calculated the proportions of significant differences in marginal means across time points, finding these proportions to range from 0 to 0.48. Proportions of Cohen's d values exceeding the 0.1 threshold ranged from 0.38 to 0.52. In summary, although the between-group differences in resilience scores were present, the development of resilience over time appears to be stable across the subgroups.

Table 8.5 Subgroup analyses

		N	Intercept (SE)	Average Cohen's d difference between waves	Slope (p)	I-S covariance (p)	Proportion of significant differences across time points	Proportion of Cohen's ds > |.10|
Gender	Male	1683	3.51 (0.02)	0.36	-0.01 (.016)	-0.01 (.013)	.33	.48
	Female	1997	3.18 (0.02)		-0.00 (.779)	-0.01 (.010)	.43	.57
Age	Under 30	1073	3.22 (0.03)	-0.15 (U30 vs. 31-49)	-0.01 (.292)	-0.01 (.091)	0	.48
	31 to 49	1603	3.38 (0.02)		-0.01 (.008)	-0.02 (.002)	.38	.57
	50 and more	1002	3.40 (0.03)	-0.21 (U30 vs. 50+) -0.07 (31-49 vs. 50+)	0.00 (.977)	-0.01 (.181)	.33	.38
Partner status	Single	1248	3.30 (0.03)	-0.09	-0.01 (.022)	-0.01 (.072)	.29	.52
	In relationship	2434	3.36 (0.02)		-0.00 (.265)	-0.01 (.001)	.38	.38
Experienced trauma	No	1488	3.33 (0.03)	-0.00	-0.00 (.925)	-0.01 (.054)	.29	.43
	Yes	2305	3.34 (0.02)		-0.01 (.014)	-0.01 (.003)	.48	.52

The full results are available at osf.io/zucse/.

8.4 Discussion

This study aimed to explore the trajectory and changes in development of resilience across five time points between years 2020 and 2023, and the differences in this development based on gender, age, partner status, and traumatic experience. The findings were consistent with previous research, with the growth curve model revealing a significant, albeit minor, decline in resilience over time (Kimhi et al., 2020; To et al., 2022). However, we explored significant variance in these changes between specific time points and across the subgroups.

Differences across gender and partner status

Research on gender differences in resilience has indicated mixed pattern, with some studies suggesting higher levels of resilience in men compared to women (e.g., Sardella et al., 2022, Yalcin-Siedentopf, 2021, Górska et al., 2022). Based on our results, there were a significant difference in resilience scores between men and women in the baseline level, but also across all the time points, with men expressing higher resilience score than women. The higher resilience score observed in men could be attributed to traditional gender roles and societal expectations that encourage men to adopt more problem-focused coping strategies, which are often associated with higher resilience (e.g., Matud, 2004; Sampogna et al., 2021). These coping strategies, such as optimism and problem-solving abilities highlighted by Lasota at al. (2020), can be crucial in managing stress and adversities effectively. The resilience is also largely linked to the individual's social environment. It is therefore not surprising that people who are in a partner relationship and/or have more social support (Górska et al., 2022), achieve higher levels of resilience (Sardella et al., 2022), which is consistent with our results. People who were in a relationship not only achieved higher levels of resilience, but in the long-term we observed a negligible decline over time. This result suggests that emotional and social support from a partner can buffer against stress and enhance one's ability to adapt to adversities.

Differences across age

We examined change in resilience over time across three age groups – adults under 30, people aged between 30 and 50, and people over 50. The results suggest

significant differences between these groups, with people over 30 years achieving higher resilience values compared to people in the 18-30 age group both at baseline and across measurements. Such results are consistent with other authors who describe higher resilience values in older people (e.g., Rossi et al., 2021) despite their own state of health, socioeconomic status, and past personal experience (MacLeod et al., 2016). For younger individuals, the change in resilience across time did not appear to be significant (resilience decreased by 0.7% overall). Conversely, those in the 30–50-year age group who had higher resilience values at the initial measurement experienced a more rapid decline in resilience over time (1.2% decline overall). In this group, we also observed significant differences across measurements, with a significant drop in resilience between December 2020 and March 2022. This drop in values can be partly explained by the effect of the long-term stress caused by the pandemic and by the onset of the war conflict in Ukraine. Individuals in this age group might be balancing responsibilities such as childcare, eldercare, and their careers, all of which could have been significantly impacted. For the oldest age group, the initial level of resilience does not seem to have a significant impact on its decline over time. At the same time, the decline in resilience over time for this group was not significant. Older adults may have developed more effective coping mechanism and a broader perspective on handling life's challenges, contributing to their higher resilience.

Differences across traumatic experience

We observed differences in the variability of resilience dynamics between people who had not experienced a traumatic experience and those who had. While no significant decline in resilience over time was observed among people who did not experience a traumatic experience, a 1% decline in resilience was observed among people who did experience such an experience, which could indicate the cumulative impact of trauma on an individual's psychological resources (e.g., Cloitre et al., 2009). In both cases, we observed significant differences in resilience levels across time waves. The differences observed in resilience trajectories also highlight the need to consider individual and contextual factors that may influence resilience in the aftermath of trauma. Factors such as the nature and severity of trauma, the individual's social support network (e.g., Ozbay et al., 2007), access to resources (e.g., Brown & Williams, 2015), and previous coping experiences (e.g., Matheson et al., 2020) can all play significant roles in shaping

resilience. We observed slightly higher resilience score among individuals who experienced trauma in the baseline. This result might reflect a phenomenon known as stress inoculation, where exposure to manageable stressors or challenges can enhance an individual's capacity to cope with subsequent stress (e.g., Ashokan et al. 2016).

Limits and perspectives for future research

The study contributes to a better understanding of the development of resilience across various time points and differences in this development across various sociodemographic characteristics. The longitudinal design of the study facilitates the exploration of changes in resilience over time and provides insights into the dynamics of resilience's nature. To better understand the dynamics of resilience, with a focus on the individual in the everyday context, it is necessary to measure changes in resilience as intensively as possible, for example through the experience sample method. In the presented paper, resilience was assessed through self-report measures, which may introduce potential biases. Incorporating qualitative methods may be useful for a better understanding of resilience. Furthermore, while this study explored resilience across various sociodemographic characteristics, there may be other factors that influence resilience dynamics across time. For instance, individual differences in personality traits or information about socioeconomic status could play an important role in resilience.

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KAPITOLA 9

Diskusia

Cieľom tejto dizertačnej práce bolo preskúmať súvislosti medzi rezilienciou a duševným zdravím s ohľadom najmä na prežité stresujúce a traumatické životné udalosti. V rámci jednotlivých kapitol práce bol kladený dôraz na význam reziliencie u ľudí, ktorí prežili traumatickú udalosť (vo vzťahu k posttraumatickému rozvoju a posttraumatickej stresovej poruche) a tiež bol preskúmaný jej vzťah k duševnému zdraviu v súvislosti s náročným pandemickým obdobím. Pre komplexnejšie uchopenie problematiky sme v rámci štúdií pracovali s viacerými výskumnými skupinami, medzi ktoré patrila reprezentatívna vzorka dospelej populácie obyvateľov Slovenska, klinická populácia ľudí so závislosťou od alkoholu a iných psychoaktívnych látok podľa MKCH-10 a tiež stredoškolskí/-é a vysokoškolskí/-é študenti/-ky.

V rámci tejto zhrňujúcej kapitoly sú postupne uvedené a diskutované najvýznamnejšie výskumné zistenia. V ďalšom texte sú tiež diskutované silné stránky a limity práce doplnené o náčrt výskumných ale aj praktických implikácií.

9.1 Výskumné otázky a hlavné zistenia práce

V dizertačnej práci bolo formulovaných niekoľko výskumných otázok.

1. Výskumná otázka – *Aká je súvislosť medzi rezilienciou a posttraumatickým rozvojom?*

Vzťahu medzi rezilienciou a posttraumatickým rozvojom sme sa venovali v rámci kapitoly 3, kde sme zároveň validovali dotazník posttraumatického rozvoja (Posttraumatic Growth Inventory; PTGI). Na základe vykonaných analýz sme poukázali na silné korelácie medzi jednotlivými položkami dotazníka a tiež na veľmi silné korelácie medzi jeho faktormi navzájom. Z testovaných modelov vykázala najlepšie psychometrické vlastnosti modifikovaná jedno-faktorová verzia dotazníka, ktorá bola zároveň invariantná vzhľadom na rod. V rámci testovania konvergentnej validity sme skúmali súvislosti medzi PTGI, spiritualitou a rezilienciou. Na základe našich výsledkov môžeme konštatovať slabú negatívnu koreláciu medzi posttraumatickým rozvojom a rezilienciou.

2. Výskumná otázka – *Aký je význam reziliencie v kontexte rozvoja posttraumatickej stresovej poruchy u ľudí s diagnózou závislosti od alkoholu a iných psychoaktívnych látok?*

Ďalším často zdôrazňovaným dôsledkom prežitia traumatickej udalosti je posttraumatická stresová porucha, ktorej riziko je niekoľkonásobne vyššie u ľudí s poruchou užívania látok. V rámci kapitoly 4 sme sa preto venovali zmapovaniu výskytu stresujúcich a traumatických udalostí prežívaných u ľudí s touto diagnózou. Medzi skupinou ľudí so závislosťou od alkoholu a od iných psychoaktívnych látok a bežnou populáciou sme pozorovali významné rozdiely v intenzite a frekvencii prežívania traumatických a stresujúcich udalostí a to v oblasti interpersonálneho násilia, v zážitkoch prežitých do 16 roku života a tiež v celkovom skóre traumatickej záťaže. Následne sme sa v 5 kapitole práce venovali hlbšiemu preskúmaniu súvislostí medzi rezilienciou a posttraumatickou stresovou poruchou u ľudí s poruchou užívania látok, pričom výsledky sieťovej analýzy naznačujú slabý negatívny vzťah medzi rezilienciou a posttraumatickou stresovou poruchou.

3. Výskumná otázka – *Ako súvisí reziliencia s prežívaním úzkosti a úzkosti špecificky spojenej s pandémiou COVID-19?*

V ďalších dvoch kapitolách (kap. 6, 7) sme pracovali so vzorkou stredoškolských a vysokoškolských študentov/-iek a pozornosť sme venovali preskúmaniu vzťahov medzi rezilienciou a ich duševným zdravím v rámci pandemického a post-pandemického obdobia. V centre nášho záujmu bola najmä úzkosť a úzkosť špecificky spojená s COVID-19. Znížená reziliencia bola v prípade stredoškolákov/-čok významným prediktorom zvýšenej pandemickej úzkosti. V súvislosti s duševným zdravím vysokoškolákov/-čok sme poukázali na významné súvislosti medzi zníženou úrovňou reziliencie a úzkosťou, depresiou a tiež celkovým skóre závažnosti duševných ťažkostí (Global Severity Index (GSI) meraným dotazníkom Brief Symptom Inventory, BSI-53).

4. Výskumná otázka – *Do akej miery je reziliencia stabilná v čase? Líši sa táto zmena vzhľadom k sociodemografickým charakteristikám (rod, vek, partnerský status) a prežitej traumatickej udalosti?*

V poslednej výskumnej štúdii (kapitola 8) sme sledovali dynamiku vývoja reziliencie naprieč piatimi časovými bodmi (august 2020 – december 2023), pričom sme zohľadňovali súvislosti s vybranými sociodemografickými charakteristikami (rod, vek,

partnerský status) a (ne)prežitou traumatickou životnou udalosťou. Vo všeobecnosti môžeme povedať, že zmeny v úrovni reziliencie v priebehu času boli minimálne (celkovo reziliencia klesla o 0,7%). Na druhej strane sme však pozorovali signifikantnú varianciu reziliencie v počiatočných hodnotách a v jej zmene v čase. U ľudí s vyšším priemerným skóre reziliencie v úvode meraní bol pozorovaný výraznejší pokles reziliencie naprieč časovými obdobiami. Signifikantný pokles reziliencie bol pozorovaný medzi tretím (december 2020) a štvrtým meraním (marec 2022). Tento pokles môžeme čiastočne vysvetliť dlhodobým pôsobením stresu spôsobeného pandémiou a tiež začiatkom vojnového konfliktu na Ukrajine. Vyššie priemerné skóre reziliencie naprieč časom mali muži, ľudia starší ako 30 rokov a tí, ktorí boli v partnerskom vzťahu.

9.2 Diskusia o kľúčových zisteniach

9.2.1 Reziliencia v kontexte prežitej traumy

Veľká časť ľudí počas svojho života zažije nejakú traumatickú udalosť. Na základe dát Svetovej zdravotníckej organizácie je prevalencia traumatických udalostí na úrovni 70,4 % (Kessler et al., 2017). Medzi najčastejšie udávané traumatické udalosti patrí nečakaná smrť blízkej osoby (31,4 %), byť svedkom smrti alebo vážneho zranenia inej osoby (23,7 %), lúpež (14,5 %), život ohrozujúca automobilová nehoda (14,0 %) a život ohrozujúce zranenie alebo ochorenie (5 %) (Benjet et al., 2016). Zatiaľ čo väčšina ľudí, ktorí prežili počas svojho život nejaký traumatický zážitok sa z neho zotaví bez výraznejších duševných ťažkostí (Bonanno et al., 2015), u cca 5 % sa rozvinie posttraumatická stresová porucha (PTSP, Koenen et al., 2017). Prevalencia PTSP sa z dôvodu rozdielov v geografickej distribúcii traumy líši aj naprieč rôznymi krajinami a populáciami (Asnakew et al., 2019). Z hľadiska rozvoja PTSP sú rizikovou skupinou ľudia s rozvinutým syndrómom závislosti od alkoholu a iných psychoaktívnych látok, u ktorých sa prevalencia prežitých traumatických zážitkov dostáva na úroveň cca 90 % (podľa Gielen et al., 2012 je to cca 97,4 %) a u ktorých je tým pádom aj riziko rozvoja PTSP niekoľkonásobne vyššie (Gielen et al., 2012; McCaule et al., 2013). V rámci našej práce so vzorkou ľudí s látkovou závislosťou (kapitola 4) sme v zhode s týmito výskumnými zisteniami pozorovali významný rozdiel v intenzite a frekvencii prežívania traumatických a stresujúcich udalostí v porovnaní so vzorkou z bežnej populácie. A to ako aj v oblasti interpersonálneho násilia, ktoré je popisované ako najrizikovejšie z hľadiska prípadného rozvoja PTSP (sexuálne zneužívanie a fyzické násilie; Bryant, 2019).

Dôležitú protektívnu úlohu v rámci prevencie negatívnych dôsledkov stresu a traumatických udalostí, akým môže byť aj posttraumatická stresová porucha, zohráva reziliencia (Lee et al., 2014; Wrenn et al., 2011). V rámci našich výskumných zistení (kapitola 5) bola reziliencia v slabom negatívnom vzťahu s PTSP u ľudí so syndrómom látkovej závislosti, ktorí mali v porovnaní s bežnou populáciou nižšiu mieru reziliencie (nie však signifikantne). Na rezilienciu je v rámci novších výskumných zistení nahliadané ako na dynamický proces, pričom vyššia úroveň reziliencie je spájaná s viacerými biologickými, psychologickými a sociálnymi faktormi (napr. životný optimizmus, sociálna opora, využívanie tzv. aktívnych zvládacích stratégií atď.). Vyššia sociálna opora, pozitívne emócie a vyššia sebaúcta (angl. "self-esteem"), vo všeobecnosti spájané s vyššou mierou reziliencie, by mohli mať úlohu mediátorov vo vzťahu medzi rezilienciou a stresom (Yang et al., 2020). Pre rozvoj PTSP u ľudí so syndrómom závislosti môžu okrem iných významných faktorov, zohrávať dôležitú úlohu aj traumatické udalosti z detstva, adolescencie prípadne neskoršieho života (Cicchetti & Handley, 2019; Kascakova et al., 2022). Práve traumatické udalosti z detstva a adolescencie môžu významne ovplyvniť aj fungovanie v medziľudských vzťahoch. Môžu súvisieť s neistou vzťahovou väzbou a tým zvýšiť vzťahovú úzkosť prípadne vyhýbavosť (Kaščáková et al., 2020), čím významne prispievajú k celkovo nižšej miere reziliencie. Podľa štúdie Nishini et al. (2020) ľudia, ktorí v detstve zažili nejakú formu zlého zaobchádzania, mali signifikantne nižšie hodnoty reziliencie v dospelosti v porovnaní s ľuďmi, ktorí takéto zážitky nemali. Emočné zanedbávanie malo v tomto prípade najvýraznejší vplyv na rezilienciu v dospelosti (skúmaný bol vplyv emočného a fyzického, vrátane sexuálneho, zneužívania). Hoci reziliencia nepochybne plní významnú ochrannú úlohu v rámci zvládania stresu a záťaže, na základe našich výskumných zistení nemusí byť pri PTSP u týchto pacientov rozhodujúca. Vzhľadom na komplexnosť problémov ľudí so závislosťou je však veľmi dôležité zameriavať pozornosť aj na ich históriu prípadných prežitých traumatických udalostí (Simpson et al., 2021).

V súvislosti s prežitou traumou sa v posledných rokoch stále viac hovorí aj o posttraumatickom rozvoji ako o pozitívnom dôsledku takéhoto zážitku na život človeka. Ten je najčastejšie popisovaný ako pozitívna zmena v piatich oblastiach života: (1) nové možnosti, (2) vzťahy s inými, (3) spirituálna zmena, (4) osobná sila a (5) váženie si života (Tedeschi & Calhoun, 1996). Síce sa na prvý pohľad môže zdať, že posttraumatický rozvoj je pojem obsahovo veľmi podobný reziliencii, ide o dva odlišné konštrukty. Hoci

sú výsledky výskumu v oblasti skúmania vzťahu medzi týmito dvoma premennými nekonzistentné, naše výsledky (kapitola 1) sa prikláňajú k existencii negatívneho vzťahu. Ten môžeme vysvetliť tým, že u ľudí s vysokou mierou odolnosti nemusí pri strete s traumatickou udalosťou dôjsť k procesu kognitívnej evaluácie (Levine et al., 2009; Westhpal & Bonnano, 2007), ktorý zohráva kľúčovú úlohu v procese posttraumatického rozvoja (Tedeschi & Calhoun, 1996).

9.2.2 Reziliencia v kontexte pandémie

Pandémia COVID-19 sa od roku 2020 stala celosvetovou témou a veľkou výzvou pre individuálne ale aj spoločenské fungovanie. Hoci v nejakej miere ovplyvnila životy všetkých ľudí, k jednej z najviac zraniteľných skupín môžeme zaradiť študentov/-ky stredných a vysokých škôl, ktorých životy boli zasiahnuté rovnako na osobnej ako aj na akademickej úrovni. Väčšina škôl a univerzít bola kvôli šíriaceho sa vírusu nútená prejsť na online vzdelávací systém, ktorý bol pre psychiku a duševnú pohodu študentov/-iek veľkou záťažou (Dhar et al., 2020). Dáta zo Slovenska naznačujú až dvojnásobný nárast v miere prežívania úzkosti (20,1 %) a depresie (34,3 %) počas pandémie (Hajduk et al., 2022), hoci sa zdá, že miera prežívaného stresu a ťažkostí s dušeným zdravím sa v priebehu ďalších pandemických vĺn mierne znížila (Rogowska et al., 2021; Robinson et al., 2023). Významnú úlohu pre udržanie duševného zdravia v náročnom pandemickom období zohrávala práve reziliencia (Wu et al., 2020; Riehm et al., 2021). V zhode s vyššie uvedenými zisteniami aj naše dáta použité v kapitole 7, ktoré sme získali od vysokoškolských študentov/iek naznačujú významný vplyv nízkej miery reziliencie na úzkosť, depresiu, ale aj celkovú závažnosť symptómov psychopatológie. Významnými rizikovými faktormi boli v tomto prípade aj osamelosť a vnímaný stres, ktoré sa rovnako spájajú s celkovo zníženou mierou reziliencie (Riehm et al., 2021).

Práve sociálny kontakt, výrazne obmedzený na základe pandemických reštriktívnych opatrení, zohráva kľúčovú úlohu aj v období dospievania. Sociálna izolácia, pocity samoty a osamelosti významne prispievali k rozvoju duševných ťažkosti u adolescentov/-iek v období COVID-19 (Cohen et al., 2021). Adolescenti/-ky s históriou duševných ťažkostí (u ktorých bol od roku 2009 - 2019 zaznamenaný 42,8% nárast v ambulantnej psychiatrickej starostlivosti (Národné centrum zdravotníckych informácií, 2020) mohli byť z hľadiska duševného zdravia ešte o čosi zraniteľnejšou skupinou skrz obmedzenú psychiatrickú/psychologickú starostlivosť, zvýšenú úzkosť špecificky spojenú s COVID-19, prípadné ťažkosti so zvládaním všetkých reštrikcií, najmä

lockdownov (Guessoum et al., 2020). Práve aktívne zvládacie stratégie (socializácia, koníčky, cvičenie), vo väčšej či menšej miere narušené pandémiou, sú v tomto veku spájané so zvýšenou rezilienciou voči stresu, ktorá môže výrazne napomôcť duševnému zdraviu (Beames et al., 2021). V rámci nášho výskumu (kapitola 6) bola reziliencia významným protektívnym faktorom pri úzkosti špecificky spojenej s COVID-19, rovnako ako mužský rod a vzťahová vyhýbavosť. Tieto výskumné zistenia sú v súlade s existujúcou literatúrou zdôrazňujúcou úlohu reziliencie, okrem iného aj v kontexte úzkosti špecificky spojenej s COVID-19 (Skalski et al., 2021; Barzilay et al., 2020), ktorá môže výrazne napomôcť celkovému udržaniu duševného zdravia v období adolescencie, ktorá je dôležitým obdobím pre vývoj mozgu (Fuhrmann et al., 2015).

9.2.3 Reziliencia a jej zmeny v čase

Na rezilienciu nahliadame ako na konštrukt, ktorý je dynamický a dokáže sa meniť naprieč rôznymi životnými obdobiami a pôsobením viacerých faktorov. Medzi tie patria napríklad využívané copingové stratégie, životný optimizmus či niektoré z osobnostných charakteristík, akými sú napríklad extraverzia/intraverzia (Wu et al., 2013). Významné rozdiely v miere reziliencie boli pozorované aj v súvislosti so sociodemografickými charakteristikami. Zdá sa, že ženy dosahujú vo všeobecnosti nižšie hodnoty reziliencie v porovnaní s mužmi (e.g., Sardella et al., 2022). Reziliencia tiež stúpa priamo úmerne s vekom (e.g., Rossi et al., 2021) a jej miera súvisí s partnerským statusom (e.g., Górska et al., 2022).

V zhode s týmito výskumami, naše výsledky naznačujú signifikantné rozdiely v hodnotách reziliencie medzi mužmi a ženami, pričom muži dosahovali vyššie skóre. Tieto výsledky môžeme čiastočne vysvetliť aj možnými rozdielmi vo využívaných zvládacích stratégiách medzi pohlaviami. Muži častejšie využívajú aktívne, na riešenie problémov orientované stratégie, ktoré môžu zohrávať dôležitú úlohu aj pri zvládaní stresujúcich situácií a celkovo zvýšenej reziliencii (e.g., Lasota et al., 2020).

Schopnosť reziliencie je do veľkej miery spojená aj so sociálnym okolím a mierou sociálnej opory jednotlivca (Górska et al., 2022). Nie je preto prekvapujúce, že ľudia v partnerskom vzťahu dosahujú vyššie hodnoty reziliencie (Sardella et al., 2022). Tieto zistenia podporujú aj naše výsledky, ktoré tiež naznačujú len slabý pokles v hodnotách reziliencie v čase, čo len zdôrazňuje dôležitosť emočnej a sociálnej opory v partnerskom vzťahu, okrem iného aj v zvládaní náročných situácií.

V zhode s predošlým výskumom (e.g., Rossi et al., 2021) sme v našich dátach pozorovali vyššie hodnoty reziliencie u ľudí starších ako 30 rokov a to tak v úvodných meraniach ako aj v čase. Zatiaľ čo u ľudí z vekovej skupiny 18-30 rokov nebola pozorovaná signifikantná zmena reziliencie v čase, u ľudí zo skupiny 30-50 rokov došlo k rýchlejšiemu a výraznejšiemu poklesu v jej hodnotách. Tieto zmeny môžeme čiastočne vysvetliť pôsobením dlhodobého stresu spôsobeného pandémiou a tiež zhoršením aktuálnej geopolitickej situácie súvisiacej so začiatkom vojny na Ukrajine. U najstaršej skupiny ľudí (nad 50 rokov) sme nepozorovali výrazné zmeny v úrovni reziliencie v čase.

Naopak, naše dáta naznačujú rozdiely vo variabilite dynamiky reziliencie medzi ľuďmi, ktorí nezažili traumatický zážitok a tými, ktorí ho prežili. Zatiaľ čo u ľudí, ktorí neprežili traumatický zážitok nebol pozorovaný signifikantný pokles reziliencie v čase, u ľudí, ktorí traumatický zážitok prežili reziliencia v čase poklesla o 1 %. Ľudia s prežitou traumou dosahovali v úvodnom meraní mierne vyššie hodnoty reziliencie, na čo môžeme nahliadať skrz fenomén známy ako „očkovanie stresom“ (ang. „stress inoculation“; Ashokan et al., 2016), ktorý hovorí o zlepšení schopnosti zvládať stres pri kontakte s jeho zvládnuteľnou úrovňou. Na druhej strane však celkový pokles reziliencie v čase zdôrazňuje jej kumulatívny vplyv na psychologické zdroje ľudí (e.g., Cloitre et al., 2009).

9.3 Prínosy a limity práce

Za významný prínos tejto práce považujeme najmä použitie viacerých reprezentatívnych vzoriek dospelých obyvateľov Slovenska, čo poskytuje širší pohľad na skúmané témy. Ďalšie výskumné skupiny zastúpené v štúdii sú rovnako pomerne veľké (najmä skupina vysokoškolských a stredoškolských študentov/-iek). Pri zovšeobecňovaní týchto výsledkov je ale potrebné brať do úvahy ich potenciálne obmedzenie z dôvodu samo-výberu respondentov do vzorky, čo mohlo súvisieť s tým, že študenti/-ky, ktorí/-é sa rozhodli na dotazníky reagovať, pociťovali výraznejšie duševné ťažkosti a chceli o nich hovoriť.

V rámci práce sme sa tiež venovali relatívne ťažko dostupnej a z toho dôvodu málo preskúmanej skupine ľudí s rozvinutým syndrómom závislosti od alkoholu a iných psychoaktívnych látok. Aj napriek veľkosti vzorky boli v tomto prípade relatívne stabilné odhady indexu sily, čo prispieva k dôveryhodnosti výsledkov. Na druhej strane je potrebné spomenúť prierezový dizajn väčšiny štúdií použitých v rámci práce, čo bráni vo vyvodzovaní kauzality. V prípade skúmania posttraumatickej stresovej poruchy v kontexte diagnózy poruchy užívania látok, je tak potrebné zdôrazniť obojsmernú povahu

vzťahu medzi týmito dvoma premennými, ku pochopeniu ktorého by bol nápomocný longitudinálny výskumný dizajn.

V rámci jednotlivých štúdií sme sa snažili zohľadniť čo najväčšie množstvo premenných, ktoré by mohli ovplyvňovať výskum. Uvedomujeme si však, že pri niektorých výskumných otázkach by bolo vhodné zaradenie ďalších premenných. Napríklad pri skúmaní vzťahu medzi rezilienciou a PTSP u ľudí s poruchou užívania látok by mohlo byť prospešné zaradenie sociodemografických údajov, komorbídnych psychiatrických diagnóz, či špecifických informácií týkajúcich sa prežitej traumy. V prípade výskumu zameraného na stredoškolských a vysokoškolských študentov/-ky by bolo okrem zaradenia pre-pandemických informácií vhodné doplniť informáciu týkajúcu sa prípadného prekonania ochorenia COVID-19. Tieto premenné by mohli priamo ovplyvniť psychické zdravie študentov/-iek. Integrácia menovaných faktorov v ďalšom výskume by mohlo zlepšiť pochopenie skúmaných vzťahov.

Na druhej strane, práca s viacerými skupinami významne prispela ku komplexnému preskúmaniu konštruktov naprieč viacerými kontextami. Silnou stránkou je tiež použitie longitudinálneho dizajnu, vďaka ktorému sme mohli preskúmať dynamiku vývoja reziliencie naprieč troma rokmi. Použité dotazníkové metódy sú štandardne validované a v praxi bežne využívané. Napriek tomu, je potrebné zdôrazniť potenciálnu limitáciu práce spojenú s používaním výlučne seba-posudzovacích škál, čo zvyšuje riziko sociálne žiadúcich odpovedí, ktoré môžu viesť k možnému skresleniu.

9.4 Praktické a výskumné implikácie

Pre lepšie porozumenie duševnému zdraviu sú nevyhnutné presné a valídne nástroje na jeho meranie. Identifikácia kľúčových zložiek (a položiek) posttraumatického rozvoja (PTG; kapitola 3) umožňuje skrátenie dotazníka zameraného na jeho meranie a tým ponúka potenciál pre efektívnejší výskum. Rovnako to však umožňuje lepšie cielenie terapeutických intervencií zameraných na ľudí, ktorí prežili traumatickú udalosť. Hoci naše zistenia naznačujú negatívne vzťahy medzi rezilienciou a PTG, výskumné zistenia v tejto oblasti nie sú konzistentné, čo poukazuje na potrebu hlbšieho preskúmania vzťahov napríklad skrz meta-analytické štúdie.

Výsledky štúdie zameranej na vzťah medzi rezilienciou a posttraumatickou stresovou poruchou (PTSP; kapitola 4-5) u ľudí s poruchou užívania látok zdôrazňujú potrebu zohľadnenia možného prežitia traumatických udalostí pri liečbe. Neliečená PTSP môže narúšať priebeh liečby poruchy užívania látok a tým znížiť jej efektivitu.

Reziliencia zohráva dôležitú protektívnu úlohu pre duševné zdravie študentov/-iek stredných a vysokých škôl a to nielen v pandemickom období. Tieto výsledky zdôrazňujú potrebu cielených intervenčných programov zameraných na zvýšenie reziliencie, a to najmä v kontexte podpory rodinných a rovesníckych vzťahov a práce so stresom a záťažou. Rovnako sme poukázali na významné rozdiely v úrovni reziliencie medzi rôznymi skupinami obyvateľstva, s vyššou úrovňou u mužov, ľudí starších ako 30 rokov a tých, ktorí sú v partnerskom vzťahu. Tieto zistenia môžu byť rovnako užitočné pre efektívnejšie cielenie intervenčných programov berúc do úvahy potenciálne zraniteľnejšie skupiny obyvateľstva.

Preskúmanie vplyvu sociálnych faktorov, ako je rodinné prostredie a komunita na rezilienciu v kombinácii so sledovaním faktorov ovplyvňujúcich dynamiku reziliencie z dlhodobého hľadiska, by mohlo byť užitočné najmä pre tvorbu terapeutických intervencií a prístupov zameraných na podporu reziliencie. Takéto intervencie majú preukázanú efektivitu na viaceré oblasti duševného zdravia (Leppin et al., 2014; Joyce et al., 2018). Zvyčajne kombinujú rôzne techniky kognitívno-behaviorálnej psychoterapie zamerané najmä na prácu so stresom a záťažou, riešenie problémov kombinujúc pri tom techniky všímavosti, relaxačné cvičenia a kognitívnu reštrukturalizáciu. Na podporu reziliencie u vojakov/-čiek existuje program „Master Resilience Training“, ktorý vychádza z pozitívnej psychológie a pracuje s konkrétnymi zručnosťami podporujúcimi rezilienciu (Reivich et al., 2011). Medzi najvýznamnejšie programy zamerané na prácu so študentami/-kami patrí napríklad CORE (angl. „Cultivating Our Resilience“), čo je online program zameraný na podporu rezilience a zvládacích stratégií pre vysokoškolských študentov/-ky (Palma-Gómez et al., 2020). Na detský a adolescentný vek bol vytvorený program odolnosti Penn (angl. „Penn Resilience Program“), ktorý je zameraný najmä na zníženie symptómov úzkosti a depresie (Brunwasser et al., 2009).

9.5 Záver

V tejto práci boli preukázané súvislosti medzi rezilienciou a duševným zdravím v rámci viacerých výskumných skupín. Na základe vykonaných analýz sme poukázali na negatívne vzťahy medzi rezilienciou a posttraumatickým rozvojom, ako pozitívnym dôsledkom prežitia traumatickej udalosti, v rámci reprezentatívnej vzorky dospelej populácie. U ľudí s poruchou užívania látok sme pozorovali len miernu súvislosť medzi rezilienciou a posttraumatickou stresovou poruchou. Výsledky ďalších analýz zdôrazňujú protektívnu úlohu reziliencie pre duševné zdravie študentov/-iek stredných a vysokých

škôl v pandemickom kontexte. V závere práce sme sledovali dynamiku vývoja reziliencie počas trojročného obdobia, pričom sme analyzovali vplyv sociodemografických charakteristík. Na základe týchto zistení sme formulovali odporúčania pre ďalší výskum a prax zdôrazňujúc význam reziliencie pri ochrane duševného zdravia v náročných situáciách.

9.6 Zhrnutie

Predkladaná dizertačná práca analyzuje vzťahy medzi rezilienciou a duševným zdravím v rôznych kontextoch, s dôrazom najmä na jej úlohu v súvislosti s prežitými stresujúcimi a traumatickými udalosťami. Úvod práce je venovaný dvom potenciálnym dôsledkom prežitia traumy – posttraumatickému rozvoju a posttraumatickej stresovej poruche a to vo všeobecnej aj klinickej populácii ľudí s poruchou užívania látok. Realizovaná analýza potvrdila negatívny vzťah medzi rezilienciou a posttraumatickým rozvojom, pričom sme tiež overili psychometrické vlastnosti dotazníka na jeho meranie.

Pozorovali sme len slabý vzťah medzi rezilienciou a jednotlivými klastrami posttraumatickej stresovej poruchy (PTSP), definovanými podľa DSM-5, u ľudí s poruchou užívania látok. Táto skupina dosiahla tiež nižšie priemerné hodnoty reziliencie a naopak vyššie hodnoty v jednotlivých klastroch PTSP v porovnaní s bežnou populáciou. Naše zistenia poukazujú na výrazné rozdiely v intenzite a frekvencii prežívaných stresujúcich a traumatických životných udalostí.

Pri sledovaní súvislostí medzi rezilienciou a duševným zdravím u stredoškolských a vysokoškolských študentov/-iek sme poukázali na jej významnú protektívnu úlohu pri úzkosti, depresii, úzkosti špecificky spojenej s COVID-19, ale aj celkovej závažnosti psychopatológie. V rámci longitudinálneho pozorovania reziliencie sme zistili len mierne zmeny naprieč troma sledovanými rokmi, avšak signifikantnú varianciu v počiatočných hodnotách a v jej zmene v čase v rámci skupín. Vyššie priemerné skóre reziliencie v čase mali muži, ľudia starší ako 30 rokov a tí, ktorí boli v partnerskom vzťahu.

Na základe získaných poznatkov sme formulovali implikácie pre ďalší výskum, zdôrazňujúce potrebu hlbšieho preskúmania mechanizmov ovplyvňujúcich rezilienciu. Zdôraznili sme tiež odporúčania pre prax sústredené na podporu reziliencie prostredníctvom rozvoja rodinných a rovesníckych vzťahov a tiež na prácu s prípadnou traumatickou históriu pri liečbe syndrómu závislosti.

9.7 Abstract

The present dissertation thesis examines the connections between resilience and mental health across various contexts, focusing on resilience's role in the context of surviving stressful and traumatic events. The introduction is devoted to a discussion of the potential outcomes of trauma survival: posttraumatic growth (PTG) and posttraumatic stress disorder (PTSD), in both the general population and a clinical population diagnosed with substance use disorder. Our analysis confirmed a negative relationship between resilience and posttraumatic growth. Moreover, we tested the psychometric properties of the Posttraumatic Growth Inventory.

Conversely, we found only weak correlations between resilience and the DSM-5-defined clusters of PTSD in individuals with substance use disorder. These individuals also reported lower average resilience levels and, in turn, higher scores in PTSD clusters compared to the general population. The findings indicate significant differences in the intensity and frequency of experiencing stressful and traumatic events.

In examining the associations between resilience and mental health among high school and university students, we identified resilience as a significant protective factor against anxiety, depression, COVID-19-related anxiety, and overall mental distress (i.e., General Severity Index). The longitudinal study on resilience showed only minor overall fluctuations over time, but notable differences in baseline resilience levels and their changes at specific time points. We observed higher resilience scores over time in men, individuals over 30 years, and those in partner relationships.

The findings provide several implications for future research, particularly the need to investigate the factors and mechanisms influencing resilience. We also suggest practice recommendations focused on enhancing resilience through the development of familial and peer relationships and addressing potential trauma histories in treating substance use disorder.

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