Zaburzenie związane z kompulsywnymi zachowaniami seksualnymi i problematyczne korzystanie z pornografii w kontekście więzi społecznych: rola postrzeganego wsparcia społecznego, stylów przywiązania i stresu mniejszościowego

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Spis treści

Streszczenie rozprawy doktorskiej

Wprowadzenie. Zaburzenie związane z kompulsywnymi zachowaniami seksualnymi (CSBD) oraz jego najczęstsza forma – problematyczne korzystanie z pornografii (PPU) – mogą być konceptualizowane jako zaburzenia nawiązywania więzi społecznych, intymności lub przywiązania. Celem rozprawy doktorskiej było uzupełnienie luk badawczych dotyczących roli więzi społecznych w CSBD i PPU zgodnie z kryteriami zawartymi w najnowszym wydaniu *Międzynarodowej Statystycznej Klasyfikacji Chorób i Problemów Zdrowotnych ICD-11* Światowej Organizacji Zdrowia. Analizowane zmienne społeczne obejmowały postrzegane wsparcie społeczne, pozabezpieczne style przywiązania oraz stres mniejszościowy.

Metoda. Przeprowadzono cztery badania przekrojowe: badanie 1 (n = 807) na próbie dorosłych zebranej za pośrednictwem mediów społecznościowych, badanie 2 (n = 1526) panelowe na reprezentatywnej próbie ogólnopolskiej, badanie 3 (n = 198) obejmujące cispłciowe osoby należące do mniejszości seksualnych oraz badanie 4 (n = 1002) panelowe na populacji osób dorosłych. Uczestnicy wypełniali kwestionariusze online; zastosowano analizy regresji i mediacji.

Wyniki. W badaniu 1 wyższy poziom postrzeganego wsparcia społecznego był istotnie związany z niższym nasileniem symptomów CSBD i PPU, szczególnie w przypadku wsparcia od partnera i przyjaciół. W badaniu 2 zaobserwowano podobny efekt, z kluczową rolą wsparcia ze strony rodziny i przyjaciół. W badaniu 3, wśród osób z mniejszości seksualnych, wyższe wsparcie społeczne wiązało się z niższym nasileniem objawów CSBD, natomiast doświadczenia dyskryminacji ze względu na orientację seksualną oraz angażowanie się w chemseks związane było z wyższym nasileniem tych objawów. Zinternalizowane uprzedzenia wobec własnej orientacji seksualnej statystycznie przewidywały natomiast wyższy poziom PPU. W badaniu 4 zarówno lękowy, jak i unikający styl przywiązania były istotnie związane z

wyższym nasileniem objawów CSBD i PPU, przy czym styl lękowy miał silniejszy związek z objawami. Trudności w regulacji emocji pośredniczyły w tych zależnościach jako mediator.

Wnioski. Zaobserwowano istotne zależności pomiędzy zmiennymi związanymi z więziami społecznymi (wsparcie społeczne, style przywiązania, stres mniejszościowy), a CSBD oraz PPU. Zależności te miały siłę od niskiej do umiarkowanej; warto jednak podkreślić, że w analizach kontrolowano zmienne socjodemograficzne oraz różne typy aktywności seksualnej. Wskazuje to na istotną rolę więzi społecznych w CSBD i PPU oraz potrzebę dalszych badań obejmujących testowanie strategii profilaktycznych i interwencji terapeutycznych ukierunkowanych na wzmacnianie relacji, regulację emocji i zmianę stylu przywiązania.

Słowa kluczowe: zaburzenie związane z kompulsywnymi zachowaniami seksualnymi; kompulsywne zachowania seksualne; problematyczne korzystanie z pornografii; pozabezpieczne style przywiązania; postrzegane wsparcie społeczne; stres mniejszościowy; mniejszości seksualne; chemseks

Abstract of a PhD Thesis

Introduction. Compulsive sexual behavior disorder (CSBD) and its most common manifestation – problematic pornography use (PPU) – can be conceptualized as disorders related to social bonds, intimacy or attachment. The aim of this doctoral dissertation was to address research gaps regarding the role of social bonds in CSBD and PPU, in line with the criteria outlined in the latest edition of the *International Classification of Diseases* (ICD-11) by the World Health Organization. The analyzed social variables included perceived social support, insecure attachment styles, and minority stress.

Method. Four cross-sectional studies were conducted: study 1 (n = 807) on a sample of adults recruited via social media; study 2 (n = 1526), a panel study on a nationally representative sample; study 3 (n = 198), involving cisgender individuals from sexual minority groups; and study 4 (n = 1002), a panel study conducted on the adult population. Participants completed online questionnaires; regression and mediation analyses were applied.

Results. In study 1, a higher level of perceived social support was significantly associated with lower severity of CSBD and PPU symptoms, particularly in the case of support from a partner and friends. In study 2, a similar effect was observed, with support from family and friends playing a key role. In study 3, among sexual minority individuals, greater perceived support was related to lower CSBD severity, while higher symptom levels were correlated with experiences of discrimination based on sexual orientation and engagement in chemsex. Internalized negative attitudes toward one's own sexual orientation statistically predicted higher levels of PPU. In study 4, both anxious and avoidant attachment styles were significantly associated with greater severity of CSBD and PPU, with the anxious style showing a stronger relationship. Difficulties in emotion regulation mediated these associations.

Conclusions. Significant associations were observed between variables related to social bonds (social support, attachment styles, minority stress) and CSBD and PPU. The strength of these associations ranged from weak to moderate; however, it is important to note that sociodemographic variables and different types of sexual activity were controlled for in the analyses. These findings highlight the important role of social bonds in CSBD and PPU and point to the need for further research on preventive strategies and therapeutic interventions aimed at strengthening interpersonal relationships, improving emotion regulation, and modifying attachment styles.

Key words: compulsive sexual behavior disorder; compulsive sexual behaviors; problematic pornography use; insecure attachment styles; perceived social support; minority stress; sexual minorities; chemsex

Wprowadzenie

Proponowana rozprawa doktorska podejmuje tematykę zaburzenia związanego z kompulsywnymi zachowaniami seksualnymi (CSBD) i problematycznego korzystania z pornografii (PPU) w kontekście roli więzi społecznych i interpersonalnych. Na rozprawę doktorską składa się cykl czterech anglojęzycznych artykułów oraz niniejszy towarzyszący autoreferat. Spośród czterech wspomnianych artykułów, trzy mają charakter empiryczny, a jeden charakter teoretyczny – stanowi on przegląd dostępnych dowodów empirycznych dotyczących podejmowanej problematyki. Każdy z artykułów został opublikowany w recenzowanym czasopiśmie o zasięgu międzynarodowym, posiadającym wskaźnik *Impact Factor*. Cykl prac tworzą następujące teksty (kolejność na liście podyktowana datą publikacji):

Artykuł 1 (A1)

Wizła, M., Lewczuk, K. (2024b). The Associations Between Attachment Insecurity and Compulsive Sexual Behavior Disorder or Problematic Pornography Use: The Mediating Role of Emotion Regulation Difficulties. *Archives of Sexual Behavior*, *53*(9), 3419–3436. https://doi.org/10.1007/s10508-024-02904-7, *IF* = 2,9; 140 pkt. MNiSW

Artykuł 2 (A2)

Wizła, M., Lewczuk, K. (2024a). Compulsive Sexual Behavior Disorder and Problematic Pornography Use in the Context of Social Ties. *Current Addiction Reports*, *11*(2), 275–286. https://doi.org/10.1007/s40429-024-00550-6, *IF* = 4,3; 20 pkt. MNiSW

Artykuł 3 (A3)

Lewczuk, K.*, **Wizła, M.***, Glica, A.*, Dwulit, A. D. (2023). Compulsive Sexual Behavior Disorder and Problematic Pornography Use in Cisgender Sexual Minority Individuals: The Associations with Minority Stress, Social Support, and Sexualized Drug Use. *Journal of Sex Research*, *61*(8), 1246–1260. https://doi.org/10.1080/00224499.2023.2245399, *IF* = 3,6; 140 pkt. MNiSW

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Artykuł 4 (A4)

Wizła, M., Glica, A., Gola, M., Lewczuk, K. (2022). The relation of perceived social support to compulsive sexual behavior. *Journal of Psychiatric Research*, *156*, 141–150. https://doi.org/10.1016/j.jpsychires.2022.10.021, *IF* = 4,8; 140 pkt. MNiSW

Artykuły bazują na czterech samoopisowych badaniach przekrojowych – artykuł opublikowany w *Journal of Psychiatric Research* (A4) bazuje na dwóch samoreplikujących się badaniach, artykuły opublikowane w *Journal of Sex Research* (A3) oraz w *Archives of Sexual Behavior* (A4) bazują na jednym badaniu. Badania zostały przeprowadzone na zróżnicowanych populacjach: reprezentatywnej dla dorosłej populacji polskiej (*n* = 1526, artykuł opublikowany w *Journal of Psychiatric Research*), grupie rekrutowanej za pomocą mediów społecznościowych (*n* = 807, *Journal of Psychiatric Research*), populacji ogólnej (*n* = 1002, *Archives of Sexual Behavior*) oraz osobach należących do mniejszości seksualnych (*n* = 198, *Journal of Sex Research*). Badania te zostały zrealizowane dzięki środkom z grantu Narodowego Centrum Nauki „Sonatina", przyznanego dr hab. Karolowi Lewczukowi, prof. uczelni (2020/36/C/HS6/00005), w którym pełniłam rolę wykonawcy oraz „Diamentowego Grantu" Ministerstwa Nauki i Szkolnictwa Wyższego, przyznanego mgr Agnieszce Glicy (0025/DIA/2019/48), w którym pełniłam rolę współpracownika. W trakcie studiów doktoranckich zostałam również laureatką programu Fulbright. W ramach programu Junior

Research Award zrealizowałam 4-miesieczny staż w Swartz Center for Computational Neuroscience na Uniwersytecie Kalifornijskim w San Diego. Podczas stażu realizowałam badania również związane z korelatami CSBD i PPU.

Zgodność z właściwymi standardami. Zgodnie ze *Standardami dla rozpraw doktorskich w dyscyplinie naukowej psychologia, opracowanymi na podstawie uchwały Komitetu Psychologii PAN z dnia 1 marca 2019 r.*, rozprawa doktorska w formie zbioru artykułów naukowych powinna spełniać jeden z dwóch zestawów kryteriów: (A) zawierać co najmniej dwa artykuły opublikowane w czasopismach z bazy JCR, w których doktorant jest wiodącym autorem przynajmniej jednego, lub (B) zawierać minimum trzy artykuły (jeden z JCR i dwa z SCOPUS), z wiodącym autorstwem doktoranta w publikacji JCR. Moja rozprawa spełnia kryteria wariantu A z nadwyżką (jak również kryterium B) – obejmuje cztery artykuły opublikowane w czasopismach z listy JCR, z czego w trzech jestem pierwszym autorem, a w jednym dzielę pierwsze autorstwo.

Język i nazewnictwo użyte w obecnym autoreferacie. W *Międzynarodowej Statystycznej Klasyfikacji Chorób i Problemów Zdrowotnych ICD-11* Światowej Organizacji Zdrowia (ICD-11; World Health Organization [WHO], 2022), CSBD zostało zaklasyfikowane w kategorii zaburzeń kontroli impulsów, chociaż badacze dyskutują nad najlepiej dopasowanym modelem etiologicznym (Bancroft i Vukadinovic, 2004; Barth i Kinder, 1987; Carnes, 2001; Coleman, 1990), z których najszerzej dyskutowany wydaje się model uzależnienia behawioralnego (Potenza i in., 2017; Sassover i Weinstein, 2022). Zgodnie z różnymi podejściami etiologicznymi i teoretycznymi, badacze używali również wielu etykiet na określenie zachowań i symptomów obecnie określanych jako charakterystyczne dla CSBD, np. zaburzenie hiperseksualne (Kafka, 2010), czy uzależnienie od seksu (Carnes, 1983). Ze względu na chęć utrzymania spójności w niniejszym autoreferacie, oraz dla zachowania zgodności z aktualnie obowiązującą klasyfikacją diagnostyczną ICD-11 (WHO, 2022), na

opisanie tych wszystkich klas symptomów używam określenia CSBD, chyba że użycie innego nazewnictwa jest istotne dla przedstawionej argumentacji.

Dodatkowo, mimo że miałam wiodący wkład w powstanie publikacji, na których opiera się moja rozprawa doktorska, w niniejszym autoreferacie, przy opisie wykonanych badań i przygotowywanych prac, posługuję się liczbą mnogą, ze względu na wieloautorski charakter prac.

Ogólne tło teoretyczne i uzasadnienie podjęcia badań własnych

Jakość więzi społecznych może odgrywać istotną rolę w kształtowaniu zdrowia psychicznego, fizycznego i ogólnego dobrostanu (Kemp i in., 2017; Kim i in., 2008; J. Wang i in., 2018; Y. Wang i in., 2021), a także wpływa na zachowania seksualne, w tym ich problematyczne formy (Efrati i Gola, 2018; Rahm-Knigge i in., 2023; Weinstein, Katz i in., 2015; Weinstein, Zolek i in., 2015). Zmienność zachowań seksualnych, ich znaczenie i regulacja nie mogą być w pełni zrozumiane bez odniesienia do relacji międzyludzkich, norm kulturowych i doświadczeń społecznych.

W ICD-11 (WHO, 2022) rozpoznano zaburzenie związane z kompulsywnymi zachowaniami seksualnymi (CSBD; *ang. compulsive sexual behavior disorder*) jako samodzielną jednostkę diagnostyczną, która charakteryzuje się trudnościami z panowaniem nad myślami, impulsami i zachowaniami seksualnymi. Rozpoznanie tego zaburzenia kreuje naturalną potrzebę eksplorowania jego cech w różnych grupach. Szczególną uwagę należy poświęcić wpływowi uwarunkowań społecznych – takich jak wsparcie społeczne, jakość więzi, style przywiązania czy doświadczenia dyskryminacji – na rozwój, przebieg oraz utrzymywanie się objawów zaburzenia. Kluczowe jest zidentyfikowanie społecznych czynników ryzyka (np. samotność, stres mniejszościowy) oraz czynników ochronnych (np. stabilne, wspierające relacje), które mogą modyfikować podatność jednostki na występowanie i nasilanie się objawów CSBD.

Szczegółowo, CSBD przyjmuje następujące kryteria diagnostyczne: (1) nadmierne skupienie (zaabsorbowanie) na aktywności seksualnej kosztem zdrowia, obowiązków zawodowych i relacji międzyludzkich; (2) obniżona kontrola w sferze seksualnej i (3) nieudane próby ograniczenia tych zachowań, myśli bądź impulsów; (4) kontynuowanie aktywności seksualnej mimo negatywnych konsekwencji i (5) obniżonej satysfakcji seksualnej lub nawet jej braku (WHO, 2022). Należy podkreślić, że samo subiektywne poczucie winy lub dezaprobata moralna ze względu na naturę podejmowanych zachowań seksualnych nie są wystarczające do diagnozy (WHO, 2022). Najczęstszą behawioralną reprezentacją zaburzenia związanego z kompulsywnymi zachowaniami seksualnymi jest problematyczne korzystanie z pornografii (PPU; *ang. problematic pornography use*). Szacuje się, że aż do 80% osób cierpiących na CSBD ma problemy z nadmiernym korzystaniem z pornografii (Reid i in., 2012). W obrazie PPU, przesadne zaabsorbowanie pornografią prowadzi do cierpienia psychicznego i negatywnych konsekwencji i może pełnić funkcję mechanizmu radzenia sobie z trudnymi emocjami (de Alarcón i in., 2019). Kwestia tego, czy CSBD i PPU powinny być traktowane jako odrębne zaburzenia, czy też CSBD jest nadrzędną kategorią, w której mieści się PPU, a także inne zachowania seksualne wymykające się spod kontroli (np. korzystanie z seks-czatów, płatnych usług seksualnych, przygodne kontakty seksualne), wciąż pozostaje przedmiotem dyskusji wśród badaczy kompulsywnych zachowań seksualnych (Antons i Brand, 2021).

CSBD i PPU w kontekście więzi społecznych i interpersonalnych

Dysponujemy ograniczoną liczbą badań na temat związków CSBD i PPU a jakością więzi społecznych i interpersonalnych (Wizła i Lewczuk, 2024a). Niektóre badania empiryczne oraz analizy teoretyczne sugerują, że CSBD i PPU mogą wynikać z trudności w tworzeniu więzi interpersonalnych i stanowić sposób radzenia sobie z lękiem oraz poczuciem osamotnienia (Cardoso i in., 2023; Dhuffar i in., 2015; Mestre-Bach i Potenza, 2023; Wéry i

in., 2020). Ciągle brakuje jednak dowodów empirycznych i większej liczby systematycznych badań, aby jednoznacznie określić rolę więzi społecznych dla rozwoju, utrzymywania i terapii symptomów CSBD i PPU.

Część wiodących koncepcji przypisuje większą rolę uzależniającemu potencjałowi pornografii, traktując CSBD i PPU analogicznie do uzależnień od substancji, gdzie powtarzające się zachowania nałogowe prowadzą do zwiększonej tolerancji i przez to coraz częstszego ich występowania (Kraus i in., 2016; Potenza i in., 2017). W tym ujęciu zmiennym społecznym przypisuje się drugorzędne znaczenie lub często pomija w analizach, a większość dotychczasowych badań nad CSBD i PPU koncentruje się głównie na zmiennych opisujących charakterystyki zachowań seksualnych takich jak na przykład wiek inicjacji seksualnej, czy też częstotliwość aktywności seksualnych. Podkreślenia wymaga jednak fakt, że częste korzystanie z pornografii nie jest równoznaczne z jej problematycznym używaniem (podobnie dla aktywności seksualnej z partnerem/ką) (Bőthe, Tóth-Király i in., 2020). Dlatego tak istotne jest uwzględnianie i eksplorowanie innych czynników – również społecznych i interpersonalnych (Wizła i Lewczuk, 2024a).

Jednocześnie, część badań dotyczących roli więzi społecznych dla symptomów CSBD i PPU dostarcza mieszanych wyników i wymaga dalszej klaryfikacji i rozszerzenia. Na przykład analizy dotyczące tego, czy osoba badana pozostaje w relacji intymnej czy nie, nie wykazują jednoznacznych zależności, wskazując na potencjalnie ochronną rolę relacji intymnej, ale także możliwy brak istotnego znaczenia tej zmiennej dla CSBD i PPU (Kumar i in., 2021; Lewczuk, Wizła i Gola, 2023). Może to wynikać również z tego, że kluczowe nie jest samo pozostawanie w relacji intymnej, lecz jej jakość (która może być zoperacjonalizowana na wiele sposobów) i funkcjonowanie jednostki w tej relacji. Dlatego, również w kontekście symptomów CSBD i PPU, należy badać konkretne charakterystyki relacji intymnych, interpersonalnych i społecznych w których pozostaje dana osoba.

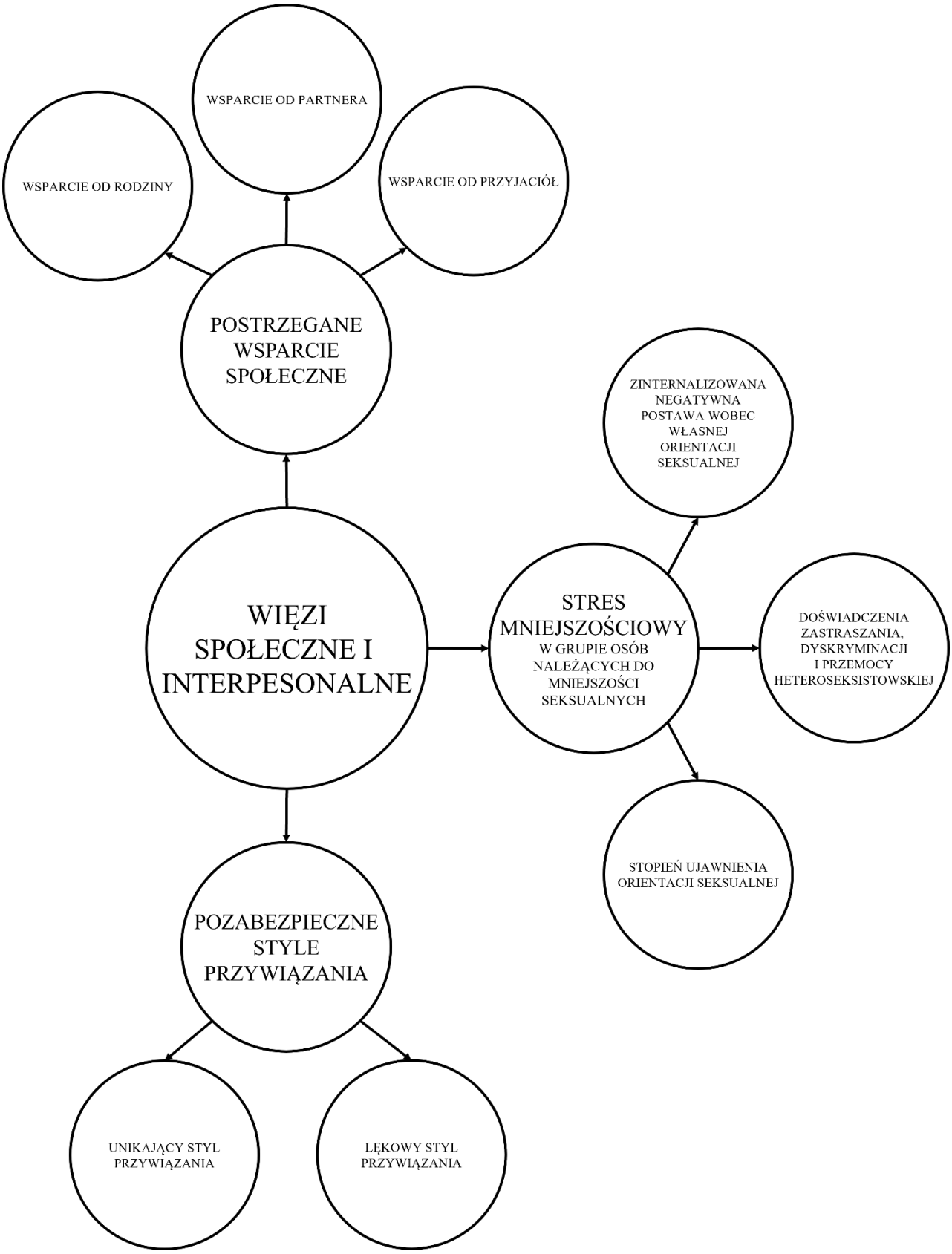
Własne podejście badawcze

Więzi społeczne można konceptualizować na wiele sposobów. W naszych analizach przyjęliśmy podejście wieloaspektowe, aby uzyskać możliwie szeroki obraz roli zmiennych społecznych w rozwoju i podtrzymywaniu objawów CSBD i PPU. Zmienne społeczne w naszych badaniach zostały zoperacjonalizowane jako:

- postrzegane wsparcie społeczne (artykuły A4 oraz A3) od:
  - rodziny,
  - przyjaciół,
  - partnera;
- style przywiązania (w tym pozabezpieczne, artykuł A1):
  - styl lękowy,
  - styl unikający;
- stres mniejszościowy (w grupie osób należących do mniejszości seksualnych, artykuł A3):
  - dyskryminacja, zastraszanie, przemoc ze względu na mniejszościową orientację seksualną,
  - stopień ujawnienia własnej orientacji seksualnej,
  - zinternalizowane negatywne postawy wobec własnej orientacji seksualnej (zob. Rysunek 1).

W naszych badaniach kontrolowaliśmy również pozostawanie w relacji intymnej (status związku). W przypadku wsparcia społecznego badaliśmy znaczenie jego różnych źródeł – od przyjaciół, rodziny oraz partnera. Style przywiązania traktowaliśmy jako inną formę charakterystyki relacji interpersonalnych; uwzględniliśmy styl lękowy i unikający, które charakteryzują się nieadaptacyjnymi sposobami reagowania emocjonalnego, poznawczego i behawioralnego w bliskich relacjach (Bowlby, 1977). Ponadto relacje osób

należących do mniejszości seksualnych mogą być obciążone stresem mniejszościowym (Meyer, 2003, 2010). Stres mniejszościowy (badany w grupie osób należących do mniejszości seksualnych) w kontekście społecznym określiliśmy przez kilka wymiarów: (a) stopień, w jakim uczestnicy doświadczyli zastraszania, dyskryminacji lub przemocy ze względu na swoją mniejszościową orientację seksualną; (b) stopień ujawnienia orientacji seksualnej w różnych kontekstach społecznych, który również odzwierciedla poziom bezpieczeństwa jednostki w relacjach społecznych; (c) zinternalizowaną fobię wobec własnej orientacji seksualnej – osoby doświadczające uprzedzeń i dyskryminacji ze strony innych ludzi mogą uwewnętrzniać/internalizować stygmatyzujące postawy społeczne. Zmienne związane z więziami społecznymi w badaniach własnych przedstawione są na Rysunku 1.



Rysunek 1 *Operacjonalizacja zmiennych związanych z więziami społecznymi i interpersonalnymi w badaniach własnych*

Dodatkowo, w przeprowadzonych analizach kontrolowany był też związek zmiennych socjodemograficznych (płeć, wiek, orientacja seksualna, status związku) oraz częstotliwości angażowania się w różne formy aktywności seksualnej (korzystanie z pornografii, masturbacja, stosunki seksualne z partnerem) z nasileniem symptomów CSBD i PPU. Dzięki temu mogliśmy pokazać potencjalny związek zmiennych społecznych z CSBD i PPU, nawet kiedy inne ważne czynniki powiązane z tymi symptomami zostały wzięte pod uwagę (były statystycznie kontrolowane).

Warto zaznaczyć, że w naszych badaniach wykorzystaliśmy dwa kwestionariusze do pomiaru nasilenia objawów CSBD, które są obecnie jedynymi narzędziami opartymi na aktualnych kryteriach diagnostycznych zawartych w ICD-11 (Bőthe, Potenza i in., 2020; Grubbs i in., 2023; WHO, 2022). Ze względu na bardzo niedawne wprowadzenie tych narzędzi, a także różnice w ich konstrukcji i wadze przypisywanej poszczególnym kryteriom diagnostycznym (tj. liczbie pozycji kwestionariuszowych odzwierciedlających dane kryterium), wymagają one dalszej weryfikacji ich właściwości psychometrycznych, w tym ich trafności i rzetelności oraz różnic w wynikach uzyskiwanych pomiędzy obydwoma narzędziami – te cele były realizowane w badaniach własnych (szczególnie artykuł A1, opublikowany w *Archives of Sexual Behavior*, gdzie zestawione zostały wyniki dla obydwu miar: Wizła i Lewczuk, 2024b). Dodatkowo wykorzystaliśmy trzeci kwestionariusz, przeznaczony specyficznie do pomiaru PPU (Kraus i in., 2020).

W kolejnych sekcjach zostanie przedstawiony bardziej szczegółowy, aktualny stan dyskutowanego obszaru badań oraz założenia teoretyczne badań własnych. Następnie, przedstawione zostaną szczegółowe cele oraz wyniki badań własnych, wnioski i ograniczenia badań, wraz z sugestiami dalszych kierunków badawczych.

Szczegółowe tło teoretyczne badań własnych

W celu identyfikacji potencjalnych luk badawczych w obszarze CSBD i PPU w kontekście więzi społecznych został przeprowadzony przegląd literatury. Na podstawie tego przeglądu i analizy literatury zostały przeprowadzone nie tylko badania empiryczne przedstawione w tym autoreferacie, ale powstał również teoretyczny artykuł przeglądowy (A2), opublikowany w *Current Addiction Reports* (Wizła i Lewczuk, 2024a).

Jako cele naszego przeglądu narracyjnego postawiliśmy sobie: (1) podsumowanie aktualnych dowodów empirycznych i ich ograniczeń dotyczących powiązania czynników społecznych z rozwojem i utrzymywaniem się objawów CSBD oraz PPU, (2) zidentyfikowanie luk badawczych w tym obszarze oraz (3) zaproponowanie kierunków przyszłych badań nad CSBD i PPU w kontekście społecznym. Jest to, zgodnie z moją najlepszą wiedzą, pierwszy i jak dotychczas jedyny przegląd dotyczący tego zakresu badań. Omówienie zagadnień poruszonych w naszej pracy przeglądowej jest również dobrym wstępem szczegółowym do przeprowadzonych badań empirycznych.

Przegląd literatury (artykuł A2, *Current Addiction Reports*) wykazał, że więzi społeczne mogą odgrywać istotną rolę w rozwoju CSBD i PPU. Empiryczne dowody wskazują na to, że czynniki społeczne, takie jak samotność (Cardoso i in., 2022; Efrati i Amichai-Hamburger, 2019; Mestre-Bach i Potenza, 2023), postrzegane wsparcie społeczne (publikacje A3, A4) (Lewczuk, Wizła, Glica i Dwulit, 2023; Wizła i in., 2022), lękowy i unikający styl przywiązania (A1) (Coleman i in., 2023; Gilliland i in., 2015; Wizła i Lewczuk, 2024b), stresory związane z przynależnością do mniejszości seksualnych (A3) (Chaney i Burns-Wortham, 2015; Dew i Chaney, 2005; Lewczuk, Wizła, Glica i Dwulit, 2023), relacje rodzic-dziecko (Efrati, 2023; Efrati i Gola, 2019) oraz jakość więzi romantycznych (Daspe i in., 2018; Lewin i in., 1998; Weinstein, Zolek i in., 2015), odgrywają istotną rolę w rozwoju, utrzymywaniu się i leczeniu CSBD i PPU. Z tego względu aspekty społeczne powinny być

brane pod uwagę nie tylko w badaniach naukowych, ale także w diagnozie i praktyce klinicznej. Uwzględnienie ich w procesie terapeutycznym może wspomagać odbudowanie więzi z partnerem oraz leczenie CSBD (Hook i in., 2008; Love i in., 2016; Reid i Woolley, 2006).

Jednocześnie, wspomniane tutaj badania, łączące problematyczne zachowania seksualne z więziami społecznymi, zostały – jedynie w nielicznych wyjątkach – przeprowadzone w odniesieniu do CSBD, zgodnie z kryteriami ICD-11 (WHO, 2022). Natomiast wcześniejsze, pokrewne, lecz nie tożsame konceptualizacje, takie jak zaburzenie hiperseksualne (Kafka, 2010) (w którym, w przeciwieństwie do CSBD, uwzględniano np. dysregulację emocjonalną) czy uzależnienie od seksu (Carnes, 2001; Carnes i in., 2014) (w którym odmienne kryteria obejmują m.in. angażowanie się w obsesje lub fantazje seksualne jako główny mechanizm radzenia sobie lub podejmowanie autodestrukcyjnych bądź obarczonych wysokim ryzykiem zachowań seksualnych), opierały się na innych kryteriach diagnostycznych. Z tego względu ważne jest przeprowadzenie badań dla CSBD zgodnie z aktualnymi kryteriami zaburzenia wprowadzonymi w ICD-11 (WHO, 2022). Przedstawiony przegląd doprowadził nas również do szeregu wniosków na temat innych ograniczeń tego obszaru badań, które zostaną szerzej omówione w jednej z końcowych części tego autoreferatu (sekcja*: Ograniczenia przeprowadzonych badań*).

Poniżej przedstawiam szerzej kluczowe obszary (również zidentyfikowane w pracy przeglądowej, A2), które zostały podjęte we własnych badaniach empirycznych, tzn. (1) rola postrzeganego wsparcia społecznego (i jego rodzajów) dla symptomów CSBD i PPU (A3, A4), (2) a także specyficzne stresory występujące w grupie podwyższonego ryzyka rozwoju CSBD, czyli wśród osób należących do mniejszości seksualnych (stres mniejszościowy) (A3), (3) pozabezpieczne style przywiązania (styl lękowy i unikający) i ich związek z regulacją

emocji w kontekście CSBD i PPU (A1). Następnie krótko omawiam najważniejsze wyniki i wnioski z badań oraz ich implikacje teoretyczne i praktyczne.

Postrzegane wsparcie społeczne jako czynnik ochronny w zaburzeniu związanym z kompulsywnymi zachowaniami seksualnymi

Jak już wspomniałam, więzi społeczne i postrzegane wsparcie odgrywają istotną rolę w kształtowaniu zachowań seksualnych (Albert, 2010; Mesch, 2009; Peter i Valkenburg, 2011), przy czym dotychczasowe badania koncentrowały się głównie na zachowaniach młodzieży. Silne relacje z rodziną, partnerem i otoczeniem szkolnym sprzyjają zdrowiu seksualnemu (Markham i in., 2010) i mniejszemu nasileniu kompulsywnych i ryzykownych zachowań seksualnych (Efrati i Gola, 2019; Trejos-Castillo i Vazsonyi, 2009; Usher-Seriki i in., 2008). Natomiast większy udział przyjaciół płci przeciwnej może przyspieszać inicjację seksualną (Boislard i Poulin, 2011).

Osoby pozostające w stabilnych związkach intymnych wykazywały niższy poziom symptomów CSBD, a problemy w relacji były predyktorem wyższych symptomów (Parsons i in., 2007; Weinstein, Zolek i in., 2015). Zakończenie relacji natomiast często prowadziło do nawrotów (Parsons i in., 2007). Wsparcie ze strony przyjaciół może być istotniejsze niż wsparcie od rodziny czy partnerów, co może wynikać z trudności w relacjach rodzinnych u osób z CSBD (Rahm-Knigge i in., 2023).

Powyższe badania pokazują wyraźny związek między jakością i typem więzi społecznych a kompulsywnymi zachowaniami seksualnymi. Nie dysponujemy jednak wystarczającymi dowodami na temat roli wsparcia społecznego pochodzącego ze specyficznych źródeł – relacji przyjacielskich, rodzinnych czy partnerskich. Wsparcie z różnych źródeł może różnić się charakterem i w odmienny sposób wpływać na jednostki – w zależności od wieku, płci lub orientacji seksualnej (Fitzgerald, 1991; Shaheen i in., 2019; Sheets Jr. i Mohr, 2009). Jak wcześniej wspomniano, kluczowe jest nie tylko samo istnienie

tych więzi, ale przede wszystkim ich jakość. Na przykład stabilny związek seksualny przewidywał mniejsze – natomiast rozważania na temat rozstania – wyższe nasilenie symptomów CSBD (Långström i Hanson, 2006; Lewin i in., 1998).

W związku z tym, aby uzupełnić poprzednie analizy, przeprowadziliśmy dwa badania: (1) analizujące związek między ogólnym postrzeganym wsparciem społecznym a nasileniem objawów CSBD i PPU, a także (2) badające związki różnych źródeł wsparcia (rodzina, przyjaciele, partner) z tymi zachowaniami. Pierwsze badanie opierało się na próbie zrekrutowanej za pośrednictwem mediów społecznościowych, natomiast drugie – na reprezentatywnej próbie ogólnokrajowej. Wyniki tych badań przedstawiamy w artykule w *Journal of Psychiatric Research* (A4).

Stres mniejszościowy a zaburzenie związane z kompulsywnymi zachowaniami seksualnymi

Po analizie roli więzi społecznych i wsparcia społecznego dla CSBD i PPU w populacji ogólnej, rolę tych czynników zbadaliśmy dla grup szczególnie narażonych na rozwój tych symptomów (Black, 2000; Dickenson i in., 2018; Kelly i in., 2009), takich jak mniejszości seksualne. Osoby należące do mniejszości seksualnych mogą w kontekście społecznym doświadczać unikatowych stresorów ze względu na swoją mniejszościową tożsamość (Chan i Leung, 2023; Ehlke i in., 2020; Meyer, 1995). Związki stresu mniejszościowego i zdrowia fizycznego (Flentje i in., 2020) oraz psychicznego (Frisell i in., 2010; Rooney i in., 2018) zostały szeroko udokumentowane. Może on przybierać formę czynników dystalnych, takich jak doświadczenia dyskryminacyjne, ale także czynników proksymalnych, na przykład zinternalizowanych uprzedzeń wobec własnej orientacji seksualnej, gdy jednostka uwewnętrznia negatywne postawy społeczne wobec osób z mniejszości seksualnych (Meyer, 2003).

Z kolei emocjonalne i fizyczne wsparcie w rodzinie prowadziło do wyższej samoakceptacji, a ta z kolei była negatywnym statystycznym predyktorem problemów ze

zdrowiem psychicznym u młodych osób doświadczających wiktymizacji ze względu na swoją orientację seksualną (Hershberger i D'Augelli, 1995). Wsparcie społeczne może działać ochronnie, redukując negatywne skutki stresu (McDonald, 2018; Szymanski i Chung, 2001), ale także samo może być ograniczone przez wewnętrzne mechanizmy, takie jak zinternalizowane uprzedzenia wobec własnej orientacji seksualnej czy ukrywanie tożsamości seksualnej (Newcomb i Mustanski, 2010; Whitehead i in., 2016). Jednakże dotychczas nie przeprowadzono badań dotyczących jego związków z symptomami CSBD i PPU, a istniejące dowody na związek stresu mniejszościowego z kompulsywnością seksualną pozostają ograniczone (Chaney i Burns-Wortham, 2015; Smith i in., 2018). Zgodnie z moją najlepszą wiedzą, wpływ różnorodnych stresorów mniejszościowych – takich jak doświadczenie dyskryminacji lub przemocy, zinternalizowane negatywne przekonania na temat własnej orientacji seksualnej, otwartość w ujawnianiu swojej orientacji seksualnej oraz postrzegane wsparcie społeczne – nie były dotychczas analizowane w kontekście CSBD i PPU. Dodatkowym potencjalnym czynnikiem ryzyka dla kompulsywnych zachowań seksualnych może być chemseks (ang. *sexualized drug use*/*chemsex*) – używanie substancji psychoaktywnych w celu zwiększenia doznań seksualnych, które jest bardziej charakterystyczne dla mniejszości seksualnych – może on być podtypem CSBD lub stanowić osobne zjawisko (Obarska i in., 2020).

Należy także podkreślić, że nasilenie stresu mniejszościowego zależy od czynników kulturowych i politycznych (Kaufman i in., 2017), a w Polsce brakowało dotychczas badań uwzględniających te aspekty. Ze względu na niedobór badań integrujących stres mniejszościowy, postrzegane wsparcie społeczne i chemseks, istnieje potrzeba ich równoczesnego uwzględnienia w modelach przewidujących CSBD i PPU. Aby zbadać powyższe zależności, przeprowadziliśmy badanie w grupie mniejszości seksualnych (osób

cispłciowych o orientacji seksualnej innej niż heteroseksualna), na podstawie którego opublikowaliśmy artykuł w *Journal of Sex Research* (A3).

Zaburzenie związane z kompulsywnymi zachowaniami seksualnymi, pozabezpieczne style przywiązania i trudności w regulacji emocji

Po przeanalizowaniu roli postrzeganego wsparcia społecznego postanowiliśmy podejść do zagadnienia więzi społecznych z innej, komplementarnej perspektywy, koncentrując się na indywidualnych wzorcach relacyjnych – analizie poddaliśmy rolę stylów przywiązania w kontekście CSBD i PPU.

Wstępne badania empiryczne pokazały, że osoby z lękowym stylem przywiązania częściej niż osoby z unikającym stylem przejawiają objawy CSBD i PPU, co może wynikać z potrzeby potwierdzenia własnej wartości i utrzymania relacji za pomocą aktywności seksualnych (Efrati i Gola, 2018; Kircaburun i in., 2021). Z kolei inne badania sugerują, że przywiązanie unikające może mieć większy wpływ na symptomy CSBD i PPU, ponieważ osoby te unikają bliskości emocjonalnej, a kompulsywne zachowania seksualne stają się jej substytutem (Leedes, 1999, 2001). CSBD i PPU mogą być też powiązane z trudnościami w regulacji emocji, które mogą prowadzić do wykorzystywania zachowań seksualnych jako mechanizmu radzenia sobie z trudnymi emocjami i stanami, takimi jak smutek, samotność lub nuda (Butler i in., 2018; Cardoso i in., 2022, 2023; Coleman, 1992; Gola i Potenza, 2016). Kwestia tego, czy takie trudności w regulacji emocji powinny być kryterium diagnostycznym CSBD, nieustannie pozostaje przedmiotem debaty (Gola i in., 2022; Lew-Starowicz i in., 2020).

Wcześniejsze badania nie dostarczają jednoznacznych wyników co do tego, który komponent przywiązania – lękowy czy unikający – odgrywa większą rolę w CSBD i PPU, dlatego poddaliśmy to analizie w badaniach własnych. Ponadto poprzednie badania pokazały, że styl przywiązania może wpływać na sposób reagowania emocjonalnego. Osoby o stylu

lękowym częściej stosują strategie hiperaktywacyjne, natomiast osoby o stylu unikającym – strategie hipoaktywacyjne (Crowell i in., 2008). Jest więc możliwe, że trudności w regulacji emocji mogą pełnić mediacyjną rolę pomiędzy stylami przywiązania a symptomami CSBD i PPU. Taka rola trudności w regulacji emocji została wykazana w poprzednich badaniach dla większości głównych klas symptomów psychiatrycznych (Benoit i in., 2010; Lewczuk, Kobylińska i in., 2021; Shakory i in., 2015). Dotychczas nie badano tego mechanizmu dla CSBD ani PPU, dlatego w naszym badaniu przetestowaliśmy model, w którym trudności w regulacji emocji umieściliśmy w roli mediatora w relacji między stylem przywiązania a CSBD i PPU.

Warto również dodać, że – tak jak dla innych obszarów badawczych opisywanych tutaj – wcześniejsze badania bazowały na poprzednich konceptualizacjach kompulsywnych zachowań seksualnych o różnych kryteriach niż CSBD w ICD-11 (WHO, 2022) i nie jest jasne, czy ich wyniki utrzymają się dla obecnej koncepcji zaburzenia. Jest to szczególnie ważne, ponieważ jednym z sugerowanych kryteriów dla zaburzenia hiperseksualnego (Kafka, 2010) (proponowanego, ale ostatecznie niewłączonego do piątego wydania *Diagnostycznego i statystycznego podręcznika zaburzeń psychicznych*, DSM-5; American Psychiatric Association [APA], 2013), ale nie dla CSBD w ICD-11 (WHO, 2022), było wykorzystywanie zachowań seksualnych do regulacji emocji. W celu analizy tych zagadnień, przeprowadziliśmy badanie, na podstawie którego powstał artykuł opublikowany w *Archives of Sexual Behavior* (A1).

Badania własne

Cele, metody, wyniki i implikacje

Zidentyfikowane w przeglądzie teoretycznym (A2, *Current Addiction Reports*) (Wizła i Lewczuk, 2024a) luki badawcze stały się punktem wyjścia dla opracowania kolejnych projektów empirycznych. Poniżej omawiam główne cele, zastosowane metody, uzyskane wyniki oraz ich implikacje w ramach każdego z czterech badań składających się na cykl artykułów opisanych w trzech artykułach empirycznych (A1, A3, A4) (Lewczuk, Wizła, Glica i Dwulit, 2023; Wizła i in., 2022; Wizła i Lewczuk, 2024b).

Związek pomiędzy postrzeganym wsparciem społecznym a kompulsywnymi zachowaniami seksualnymi (A4)

Cel badań

Celem naszych badań było określenie związku między postrzeganym wsparciem społecznym a nasileniem objawów CSBD i PPU. W szczególności skupiliśmy się na analizie różnych rodzajów wsparcia (ze strony rodziny, przyjaciół oraz partnera życiowego) i ich związków z problematycznymi zachowaniami seksualnymi. Ponadto uwzględniliśmy rolę płci w tym kontekście, biorąc pod uwagę wcześniejsze ustalenia wskazujące na różnice w rozpowszechnieniu i charakterystyce CSBD i PPU między kobietami a mężczyznami (Kowalewska i in., 2020, 2022). W badaniu kontrolowaliśmy również efekt orientacji seksualnej, ponieważ osoby należące do mniejszości seksualnych mogą być bardziej narażone na rozwój CSBD i PPU (Black, 2000; Dickenson i in., 2018), oraz wiek i status związku badanych ze względu na ich potencjalnie istotne związki z nasileniem objawów CSBD i PPU (Lewczuk, Wizła i Gola, 2023). Aby zrealizować opisywane cele badawcze, przeprowadziliśmy dwa badania oparte na tych samych miarach. Pierwsze, na próbie zebranej za pośrednictwem mediów społecznościowych, miało charakter eksploracyjny; drugie miało na celu replikację wyników na próbie reprezentatywnej dla populacji krajowej.

Metoda

Badanie 1. Badanie zostało przeprowadzone online na próbie osób zrekrutowanych w mediach społecznościowych, w grupach tematycznych poświęconych seksualności i zdrowiu seksualnemu. Wzięło w nim udział 807 osób (M_{wiek} = 21,92; *SD* = 5,64), w tym 305 mężczyzn (M_{wiek} = 24,32; *SD* = 7,77) oraz 502 kobiety (M_{wiek} = 20,40; *SD* = 2,84). Pod względem orientacji seksualnej 62,5% uczestników identyfikowało się jako osoby heteroseksualne, 8,9% jako homoseksualne, 23,2% jako biseksualne, 1,2% jako aseksualne, a 4,2% jako panseksualne. Większość uczestników (65,4%) była w związku (formalnym lub nieformalnym), natomiast 34,6% deklarowało bycie singlami.

Badanie 2. Badanie zostało przeprowadzone za pośrednictwem platformy badawczej Pollster (badanie panelowe) na próbie 1526 uczestników (M_{wiek} = 43,02; *SD* = 14,37), która była reprezentatywna dla dorosłej populacji Polski pod względem płci, wieku, wykształcenia, wielkości miejsca zamieszkania i regionu. W grupie tej znalazło się 779 kobiet (M_{wiek} = 42,08; *SD* = 14,14) oraz 747 mężczyzn (M_{wiek} = 44,00; *SD* = 14,55). Pod względem orientacji seksualnej 91,2% uczestników określiło swoją orientację seksualną jako heteroseksualną, 3,9% jako homoseksualną, 4,2% jako biseksualną, a 0,7% jako aseksualną.

Wykorzystane miary (Badanie 1 i 2). Uczestnicy wypełniali kwestionariusze dotyczące: postrzeganego wsparcia społecznego – *Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet i in., 1988); i problematycznych zachowań seksualnych, dla CSBD – *Compulsive Sexual Behavior Disorder Scale* (CSBD-19; Bőthe, Potenza i in., 2020), a dla PPU – *Brief Pornography Screen* (BPS; Kraus i in., 2020).

Zarówno dla badania 1 jak i badania 2 stworzyliśmy modele regresji dla całej próby. Dodatkowo skonstruowaliśmy osobne modele regresji dla grup mężczyzn i kobiet, w których postrzegane wsparcie społeczne (lub jego konkretne rodzaje) przewidywało nasilenie

symptomów CSBD i PPU. W każdym z modeli uwzględniliśmy orientację seksualną, wiek oraz status związku jako zmienne kontrolowane.

Główne wyniki

Badanie 1. Wyższy ogólny wynik w kwestionariuszu dotyczącym postrzeganego wsparcia społecznego statystycznie przewidywał niższy poziom CSBD i PPU na poziomie całej grupy (CSBD: β = −0,15; $p < 0,001$; PPU: β = −0,12; $p < 0,001$) i u kobiet (CSBD: β = −0,18; $p < 0,001$; PPU: β = −0,16; $p < 0,001$). Wyższe wsparcie od przyjaciół wiązało się z niższym nasileniem CSBD w całej próbie (β = −0,09; $p < 0,05$), jednak efekt ten nie był istotny w modelach osobnych dla kobiet (β = −0,09; $p = 0,078$) i mężczyzn (β = −0,08; $p = 0,237$). Natomiast w przypadku PPU silniejsze wsparcie ze strony przyjaciół korelowało z łagodniejszymi objawami zarówno u mężczyzn (β = −0,23; $p < 0,001$), jak i kobiet (β = −0,12; $p < 0,05$). Wsparcie od partnera życiowego statystycznie przewidywało niższe nasilenie symptomów CSBD wyłącznie u kobiet (β = −0,13; $p < 0,05$).

Badanie 2. Wyższy poziom postrzeganego wsparcia społecznego wiązał się z niższym nasileniem CSBD i PPU w populacji ogólnej (CSBD: β = −0,10; $p < 0,001$; PPU: β = −0,09; $p < 0,001$) i u mężczyzn (CSBD: β = −0,17; $p < 0,001$; PPU: β = −0,12; $p < 0,05$), podczas gdy u kobiet efekt ten nie był istotny (CSBD: β = −0,04; $p = 0,326$; PPU: β = −0,07; $p = 0,054$). Wsparcie ze strony rodziny okazało się czynnikiem chroniącym przed PPU zarówno u mężczyzn (β = −0,10; $p < 0,05$), jak i kobiet (β = −0,12; $p < 0,05$). Natomiast wsparcie od przyjaciół wiązało się z niższym ryzykiem CSBD, ale tylko u mężczyzn (β = −0,10; $p < 0,05$). Wsparcie od partnera życiowego nie miało istotnego związku z symptomami problematycznych zachowań seksualnych w tym badaniu (CSBD: β = −0,00; $p = 0,925$; PPU: β = 0,02; $p = 0,654$).

Podsumowując, w badaniu 1 wyższe wsparcie społeczne przejawiało istotne związki z niższym nasileniem symptomów szczególnie u kobiet, zwłaszcza jeśli pochodziło od

przyjaciół lub partnera życiowego. W badaniu 2 efekt ten był wyraźniejszy u mężczyzn, a najważniejszą rolę odgrywało wsparcie ze strony rodziny i przyjaciół.

Główne wnioski

Badania wykazały, że postrzegane wsparcie społeczne jest związane z niższym nasileniem CSBD i PPU. Związki te cechowały się jednak niewielką siłą i nie dostarczają dowodów na poparcie tych koncepcji CSBD i PPU, które stawiają jakość relacji społecznych w centralnej roli dla rozwoju i utrzymywania tych zaburzeń (Adams i Robinson, 2001; Flores, 2004). Znaczenie zmiennych społecznych może również maleć w obliczu innych ważnych dla rozwoju CSBD i PPU czynników, takich jak dostępność treści pornograficznych w Internecie (Delmonico i Carnes, 1999; Hall, 2013). Ponieważ większość badań dotyczących roli czynników społecznych w CSBD i PPU, w tym również nasze, mają charakter przekrojowy, nie pozwalają na stwierdzenie, czy trudności w relacjach są przyczyną, czy raczej skutkiem rozwoju zaburzeń (Starks i in., 2013; Zitzman i Butler, 2009). Konieczne są badania podłużne, które umożliwiłyby określenie tych skomplikowanych, prawdopodobnie dwukierunkowych zależności. Jako że włączenie wsparcia społecznego do modelu, nie pozbawiło istotności statystycznej związku pomiędzy statusem związku a CSBD/PPU, prawdopodobnie inne charakterystyki relacji romantycznej mogą odgrywać istotną rolę w CSBD i PPU. Kluczowe jest również zrozumienie roli wstydu i poczucia winy (i związanej z nimi regulacji emocji), charakterystycznych dla CSBD i PPU (Gilliland i in., 2011; Sassover i in., 2021), w czerpaniu wsparcia z relacji interpersonalnych (zagadnienia te podjęliśmy w artykule A1 opublikowanym w *Archives of Sexual Behavior*).

Związek pomiędzy stresem mniejszościowym, postrzeganym wsparciem społecznym, chemseksem a zaburzeniem związanym z kompulsywnymi zachowaniami seksualnymi i problematycznym korzystaniem z pornografii (A3)

Cel badania

Celem naszego badania było zidentyfikowanie związków między postrzeganym wsparciem społecznym, różnymi przejawami stresu mniejszościowego oraz uczestnictwem w chemseksie a objawami CSBD lub PPU wśród osób z mniejszości seksualnych (zgodnie z analizą dostępnej literatury, której wyniki zostały podsumowane w podrozdziale *Stres mniejszościowy a zaburzenie związane z kompulsywnymi zachowaniami seksualnymi*). Stres mniejszościowy operacjonalizowaliśmy za pomocą (a) oceny doświadczeń zastraszania, dyskryminacji i przemocy ze względu na orientację seksualną, (b) uwewnętrznionych uprzedzeń wobec własnej orientacji seksualnej oraz (c) stopnia ujawnienia własnej orientacji seksualnej w różnych środowiskach. Należy podkreślić, że analizowaliśmy również uczestnictwo w chemseksie, które w poprzednich pracach było wskazywane jako potencjalny czynnik ryzyka dla CSBD (Obarska i in., 2020), lecz dotąd brakowało potwierdzenia tej zależności w analizach ilościowych.

Metoda

Uczestnicy badania zostali zrekrutowani poprzez udostępnianie postów w mediach społecznościowych w grupach skierowanych do społeczności LGBT+ lub związanych z tematyką seksualności. Analizowana próba obejmowała 198 uczestników (M_{wiek} = 27,13; *SD* = 7,78). Do analizy włączyliśmy osoby, które zadeklarowały orientację inną niż heteroseksualna tj. homoseksualną, biseksualną, aseksualną, panseksualną lub poliseksualną. Z badania wykluczyliśmy osoby, które deklarowały mniejszościową tożsamość płciową – ze względu na potencjalny wpływ innych specyficznych czynników związanych z seksualnością na nasilenie CSBD i PPU. Ostateczne analizy obejmowały 144 mężczyzn (72,7%) oraz 54

kobiety (27,3%). Większość uczestników (74,2%) zadeklarowała orientację homoseksualną, 17,7% biseksualną, 4,0% aseksualną i 4,0% panseksualną. Ponad połowa osób badanych (58,6%) była w związku (formalnym lub nieformalnym), a pozostałe osoby zadeklarowały bycie singlem.

W tym badaniu, podobnie do tych opisywanych powyżej, wykorzystaliśmy te same miary dotyczące problematycznych zachowań seksualnych, czyli CSBD-19 (Bőthe, Potenza i in., 2020) i BPS (Kraus i in., 2020), oraz postrzeganego wsparcia społecznego – MSPSS (Zimet i in., 1988). Dodatkowo wykorzystaliśmy dla zinternalizowanych uprzedzeń wobec własnej orientacji seksualnej – *Revised Internalized Homophobia Scale* (Herek i in., 2009) w trzech wersjach dostosowanych dla osób o różnych mniejszościowych orientacjach; dla doświadczeń zastraszania, odrzucenia i dyskryminacji ze względu na nieheteroseksualną orientację – *Heterosexist Harassment, Rejection, and Discrimination Scale* (E. R. Smith i in., 2020); oraz dla stopnia ujawniania swojej orientacji seksualnej – *Outness Inventory* (Mohr i Fassinger, 2000). Wzorem poprzednich badań, częstotliwość chemseksu ocenialiśmy za pomocą pytania dotyczącego częstotliwości zażywania substancji psychoaktywnych podczas aktywności seksualnych (np. metylofenidat, GHB) w ostatnich 12 miesiącach. Ponadto zbieraliśmy dane na temat częstotliwości zachowań seksualnych: korzystania z pornografii, masturbacji i stosunków seksualnych.

Przeprowadziliśmy analizę wielozmiennowej regresji hierarchicznej. W pierwszym kroku uwzględniliśmy jako zmienne niezależne dane demograficzne (wiek, płeć, orientacja seksualna, status związku) oraz częstotliwość zachowań seksualnych (korzystanie z pornografii, masturbacja, akty seksualne z partnerem). W drugim etapie dodaliśmy zmienne takie jak postrzegane wsparcie społeczne, doświadczenie dyskryminacji ze względu na mniejszościową orientację seksualną, uwewnętrzniona stygmatyzacja własnej orientacji

seksualnej, stopień ujawnienia orientacji seksualnej oraz częstotliwość aktywności seksualnej pod wpływem substancji psychoaktywnych.

Główne wyniki

CSBD. W 1. kroku regresji wiek był negatywnym statystycznym predyktorem nasilenia objawów CSBD (β = −0,14; $p < 0,05$). Bycie w związku intymnym wiązało się z mniejszym nasileniem objawów CSBD (β = −0,21; $p < 0,05$). Wyższa częstotliwość stosunków seksualnych była związana z wyższym nasileniem objawów CSBD (β = 0,19; $p < 0,05$). W 2. kroku wyższe- postrzegane wsparcie społeczne było związane z niższym nasileniem CSBD (β = −0,19; $p < 0,05$). Doświadczenie dyskryminacji związanej z byciem członkiem mniejszości seksualnej było czynnikiem ryzyka dla objawów CSBD (β = 0,15; $p < 0,05$). Zaangażowanie w chemseks było związane z wyższym nasileniem objawów CSBD (β = 0,32; $p < 0,001$). W 2. kroku efekt statystycznych predyktorów takich jak status związku (β = −0,01; $p = 0,859$) oraz częstotliwość aktywności seksualnych w parze (β = 0,06; $p = 0,419$) straciły istotność statystyczną. Zmiana w wyjaśnianej wariancji między krokiem 1. ($R^2_{adj} = 0,126$) a krokiem 2. ($R^2_{adj} = 0,278$) była istotna statystycznie ($\Delta R^2 = 0,152$; $F = 8,95$; $p < 0,001$).

PPU. W 1. kroku wiek był statystycznie istotnym negatywnym predyktorem nasilenia objawów PPU (β = −0,24; $p < 0,001$). W 2. kroku zinternalizowane uprzedzenia wobec własnej orientacji seksualnej były związane z wyższym nasileniem objawów PPU (β = 0,19; $p < 0,05$). Zmiana w wyjaśnianej wariancji między krokiem 1. ($R^2_{adj} = 0,146$) a krokiem 2. ($R^2_{adj} = 0,189$) była istotna statystycznie ($\Delta R^2 = 0,043$; $F = 2,96$; $p < 0,05$).

Główne wnioski

Wyniki pokazały, że stres związany z byciem częścią mniejszości seksualnej jest związany z nasileniem objawów CSBD i PPU (Pachankis i in., 2015; N. G. Smith i in., 2018). Dokładniej – doświadczenia związane z dyskryminacją, zastraszaniem i wykluczeniem ze

względu na przynależność do mniejszości seksualnych były pozytywnie związane z nasileniem objawów CSBD. Zinternalizowane negatywne postawy wobec własnej seksualności były z kolei związane z nasileniem symptomów PPU. Osoby z wyższym poziomem wewnętrznej stygmatyzacji mogą preferować bardziej ukryte formy zachowań seksualnych, takie jak korzystanie z pornografii, aby unikać społecznego napiętnowania. W przeciwieństwie do innych badań (Bőthe i in., 2024), częstotliwość korzystania z pornografii nie była istotnym statystycznym predyktorem ani PPU ani CSBD, co może świadczyć o bardziej istotnej roli innych czynników w grupach mniejszościowych.

Równocześnie postrzegane wsparcie społeczne było negatywnie związane z nasileniem objawów CSBD; związek ten był jednak stosunkowo słaby. Oznacza to, że pozytywne relacje z otoczeniem mogą mieć znaczenie w zapobieganiu lub łagodzeniu skutków stresu mniejszościowego, co potwierdzają także wcześniejsze badania (Ehlke i in., 2020; Frost i in., 2016; Kaufman i in., 2017). Niemniej jednak, brak związku między postrzeganym wsparciem społecznym a PPU może sugerować, że w przypadku PPU ważne mogą być inne czynniki, takie jak zinternalizowane uprzedzenia wobec własnej orientacji seksualnej, która sprawia, że osoby zmagające się z PPU mają trudności w szukaniu wsparcia w swoim środowisku. Dodatkowo, zaangażowanie w chemseks okazało się umiarkowanie, pozytywnie skorelowane z nasileniem objawów CSBD, co sugeruje, że niektóre osoby mogą sięgać po tę formę zachowań w celu radzenia sobie z problemami w budowaniu relacji intymnych lub akceptacji własnej orientacji seksualnej.

Nasze badanie ma istotne implikacje zarówno teoretyczne, jak i kliniczne, ponieważ pokazuje, jak stres związany z przynależnością do mniejszości seksualnej może prawdopodobnie pełnić rolę w rozwoju i podtrzymywaniu kompulsywnych zachowań seksualnych, a także wskazują na rolę postrzeganego wsparcia społecznego w zapobieganiu takim zachowaniom. Ponadto zgodnie z naszą najlepszą wiedzą jest to pierwsze badanie

ilościowe ukazujące związek częstotliwości angażowania się w chemseks i nasilenia symptomów CSBD. W przyszłości warto skupić się na dalszym badaniu mechanizmów, które wyjaśniają związki stresu mniejszościowego z CSBD i PPU, oraz na opracowywaniu strategii terapeutycznych, które uwzględnią te specyficzne wyzwania.

Związek pomiędzy pozabezpiecznymi stylami przywiązania i zaburzeniem związanym z kompulsywnymi zachowaniami seksualnymi oraz problematycznym korzystaniem z pornografii: mediacyjna rola trudności w regulacji emocji (A1)

Cel badania

Celem naszych analiz było określenie, w jaki sposób lękowy oraz unikający komponent stylu przywiązania przewidują nasilenie objawów CSBD i PPU. Ponadto weryfikowaliśmy hipotezę, czy trudności w regulacji emocji będą pełnić funkcję mediatora tych związków, podobnie jak pokazano w badaniach dotyczących innych zaburzeń psychiatrycznych (Lewczuk, Kobylińska i in., 2021; Shakory i in., 2015). Celem uzupełniającym badania było porównanie dwóch narzędzi oceniających objawy CSBD, które jako jedyne odpowiadają aktualnej konceptualizacji tego zaburzenia – *Compulsive Sexual Behavior Disorder-Diagnostic Inventory* (CSBD-DI; Grubbs i in., 2023) oraz *Compulsive Sexual Behavior Disorder Scale* (CSBD-19; Bőthe, Potenza i in., 2020). Oba narzędzia są stosunkowo nowe, dlatego ich użyteczność w badaniach wymaga dalszej weryfikacji. Różnią się także pod względem konstrukcji oraz wagi przypisywanej poszczególnym kryteriom diagnostycznym CSBD, co rodzi konieczność sprawdzenia, czy wpływa to na uzyskiwane wyniki oraz czy narzędzia można uznać za równoważne.

Metoda

Badanie przeprowadzono na platformie Pollster, na grupie 1002 polskich uczestników (M_{wiek} = 50,49; *SD* = 13,32), w tym 503 mężczyzn (M_{wiek} = 49,25; *SD* = 13,87) i 499 kobiet

(M_{wiek} = 51,71; *SD* = 0,56). Respondenci odpowiadali na szereg miar związanych z: kompulsywnymi zachowaniami seksualnymi – CSBD-19 (Bőthe, Potenza i in., 2020), CSBD-DI (Grubbs i in., 2023) i BPS (Kraus i in., 2020); przywiązaniem lękowym i unikającym – *The Experiences in Close Relationships-Revised* (ECR-R; Fraley i in., 2000; Lubiewska i in., 2016); oraz trudnościami w regulacji emocji – *The Difficulties in Emotion Regulation Scale* (DERS; Gratz i Roemer, 2004). Ponadto kontrolowaliśmy cechy socjodemograficzne uczestników i częstotliwość podejmowania przez nich różnych zachowań seksualnych (tj. korzystanie z pornografii, masturbacja, stosunek seksualny z drugą osobą).

Przeprowadziliśmy analizy korelacji oraz mediacji, w których unikający i lękowy styl przywiązania były równoczesnymi statystycznymi predyktorami, trudności w regulacji emocji mediatorem, a objawy CSBD i PPU zmiennymi zależnymi. Stworzyliśmy trzy modele, po jednym dla każdej z dwóch miar przesiewowych CSBD, trzeci model dla PPU.

Główne wyniki

Zarówno lękowy, jak i unikający styl przywiązania były istotnymi pozytywnymi statystycznymi predyktorami trudności w regulacji emocji (β = 0,39, $p < 0,001$ dla lękowego, β = 0,16 dla unikającego, $p < 0,05$).

CSBD. W przypadku wykorzystania narzędzia CSBD-19: lękowy styl przywiązania (β = 0,15; $p < 0,001$) i styl unikający (β = 0,08; $p < 0,05$) były pozytywnie związane z wyższym nasileniem objawów CSBD. Efekty te dla stylu lękowego (β = 0,12; $p < 0,001$) i unikającego (β = 0,05; $p < 0,001$) były częściowo mediowane przez trudności w regulacji emocji. Trudności w regulacji emocji bezpośrednio przewidywały nasilenie objawów CSBD (β = 0,29; $p < 0,001$).

W przypadku wykorzystania innego narzędzia (CSBD-DI) – uzyskaliśmy nieco odmienne wyniki. Styl przywiązania lękowy był istotnym statystycznym predyktorem objawów CSBD (β = 0,11; $p < 0,05$), ale unikający nie (β = 0,03; $p = 0,427$). Natomiast

trudności w regulacji emocji mediowały związek nasilenia objawów CSBD i przywiązania lękowego (β = 0,05; $p < 0,05$) oraz w pełni mediowały związek objawów CSBD z przywiązaniem unikającym (β = 0,02; $p < 0,05$). Oznacza to, że związek unikającego stylu przywiązania i nasilenia symptomów jest całkowicie wyjaśniany przez trudności w regulacji emocji.

PPU. Lękowy styl przywiązania pozytywnie statystycznie przewidywał nasilenie objawów PPU (β = 0,13; $p < 0,001$), ale unikający nie (β = 0,01; $p = 0,805$). Efekt przywiązania lękowego był częściowo (β = 0,09; $p < 0,001$), a przywiązania unikającego w pełni (β = 0,04; $p < 0,001$) mediowany przez trudności w regulacji emocji. Trudności w regulacji emocji były także bezpośrednim statystycznym predyktorem objawów PPU (β = 0,23; $p < 0,001$).

Główne wnioski

Wyniki badania pokazały istotny związek stylów przywiązania z symptomami CSBD i PPU. Ponadto wskazują, że trudności w regulacji emocji mogą służyć jako mechanizm wyjaśniający związek pozabezpiecznych stylów przywiązania z nasileniem objawów CSBD i PPU – podobnie jak pokazano to dla innych grup objawów psychiatrycznych (Lewczuk, Kobylińska i in., 2021; Shakory i in., 2015). Ponadto wyniki sugerują, że przywiązanie lękowe może odgrywać większa rolę dla nasilenia symptomów CSBD i PPU, niż przywiązanie unikające. Ponadto wykazaliśmy, że dobór narzędzi pomiarowych może istotnie wpływać na wyniki dotyczące powiązań CSBD z innymi czynnikami. Ze statystyk opisowych wynika, że uczestnicy badania oceniali nasilenie objawów CSBD bardziej zachowawczo przy użyciu CSBD-DI niż CSBD-19, prawdopodobnie ze względu na większą złożoność tego narzędzia. Może to tłumaczyć słabsze związki między CSBD-DI a stylami przywiązania i trudnościami w regulacji emocji, ponieważ rozkład wyników był przesunięty w stronę niższych wartości. Dodatkowe analizy regresji zamieszczone w suplemencie do artykułu

wykazały, że wyższa częstotliwość masturbacji i korzystania z pornografii jest statystycznie wyjaśniana przez lękowy styl przywiązania, natomiast osoby o wyższym poziomie stylu unikającego rzadziej angażują się w aktywności seksualne w parze. Wskazuje to na konieczność dokładnego określania aktywności podejmowanych przez osoby z CSBD i PPU, gdyż mogą one wykazywać różne związki z analizowanymi zmiennymi i być wyjaśniane przez odmienne mechanizmy, na przykład w zależności od tego czy są podejmowane w świecie rzeczywistym czy wirtualnym (Antons i Brand, 2021).

Dyskusja

Podsumowując, na rozprawę doktorską składają się cztery artykuły eksplorujące powiązania między CSBD oraz PPU a zmiennymi społecznymi – takimi jak pozabezpieczne style przywiązania, postrzegane wsparcie społeczne oraz stres mniejszościowy. Należy podkreślić, że wszystkie badania zostały przeprowadzone dla aktualnej konceptualizacji CSBD, wprowadzonej w ICD-11 (WHO, 2022).

Przeprowadzone badania pokazały istotną rolę zmiennych związanych z więziami społecznymi i interpersonalnymi – wsparcia społecznego, stresorów mniejszościowych oraz stylów przywiązania – dla CSBD i PPU. Szczegółowo, w badaniach wykazaliśmy, że wpływ wsparcia społecznego różnił się w zależności od rodzaju próby (artykuł A4, *Journal of Psychiatric Research*, badanie 1 – niereprezentatywna, badanie 2 – reprezentatywna), a także od źródła wsparcia. Wyższy poziom ogólnego postrzeganego wsparcia społecznego statystycznie przewidywał niższy poziom CSBD i PPU w badaniu 1 – zarówno w całej próbie, jak i wśród kobiet. W badaniu 2 efekt ten wystąpił jedynie u mężczyzn. Wsparcie od partnera życiowego było istotnym czynnikiem chroniącym przed nasileniem objawów CSBD wyłącznie u kobiet w badaniu 1, natomiast w badaniu 2 nie wykazano istotnego związku między tym rodzajem wsparcia a symptomami problematycznych zachowań seksualnych. Z kolei wsparcie ze strony rodziny negatywnie wiązało się z PPU zarówno mężczyzn, jak i kobiety, ale jedynie w badaniu 2. Wsparcie od przyjaciół wiązało się z niższym nasileniem CSBD w całej próbie w badaniu 1, natomiast w badaniu 2 związek ten był istotny wyłącznie u mężczyzn.

W przypadku osób z mniejszości seksualnych (artykuł A3, *Journal of Sex Research,* badanie 3) postrzegane wsparcie społeczne miało negatywny związek jedynie z CSBD, ale nie z PPU. Stres mniejszościowy był pozytywnym predyktorem zarówno CSBD, jak i PPU, przy czym oba te zjawiska były powiązane z różnymi aspektami stresu. W przypadku CSBD

znaczenie miały doświadczenia związane z przemocą, zastraszaniem i dyskryminacją ze względu na orientację seksualną, natomiast dla PPU – zinternalizowane negatywne postawy wobec własnej orientacji. Dodatkowo, uczestnictwo w chemseksie było pozytywnie związane z kompulsywnymi zachowaniami seksualnymi w grupie osób z mniejszości seksualnych.

W odniesieniu do CSBD i PPU, stylów przywiązania oraz mediacyjnej roli regulacji emocji – wyniki były różne w zależności od zastosowanego narzędzia pomiarowego (Artykuł A1, *Archives of Sexual Behavior*). Dla CSBD-19 wszystkie bezpośrednie efekty były istotne, a ponadto odnotowano częściową mediację trudności w regulacji emocji w relacji między stylem lękowym i unikającym a objawami CSBD. Podobne, choć nieco odmienne wyniki uzyskano w analizach z wykorzystaniem alternatywnego narzędzia (CSBD-DI) oraz w analizach dotyczących PPU. W obu przypadkach jedynie lękowy styl przywiązania był istotnym predyktorem nasilenia objawów CSBD/PPU. Trudności w regulacji emocji pośredniczyły w relacji między stylem lękowym a objawami CSBD/PPU, natomiast w przypadku stylu unikającego – całkowicie wyjaśniały ten związek.

Warto zaznaczyć, że siła predykcyjna czynników społecznych pozostawała istotna przy kontroli zwyczajowo analizowanych zmiennych socjodemograficznych i tych dotyczących częstotliwości zachowań seksualnych. Artykuły obejmują zarówno badania przekrojowe na dużych próbach populacyjnych (w tym na próbie reprezentatywnej dla dorosłej populacji), jak i analizy skoncentrowane na grupach podwyższonego ryzyka, takich jak osoby należące do mniejszości seksualnych. Artykuł A2 opublikowany w *Current Addiction Reports*, mający charakter teoretyczny, powstał na podstawie wcześniejszego przeglądu literatury oraz identyfikacji luk badawczych. Proces ten pozwolił na wskazanie obszarów wymagających dalszej analizy, które następnie pogłębiliśmy w ramach badań empirycznych. Tekst ten stanowi podsumowanie aktualnego stanu badań w eksplorowanym obszarze, w którym uwzględniliśmy wyniki wszystkich przeprowadzonych przez nas badań.

Nasze badania mogą mieć istotne implikacje praktyczne – ich rozwinięcie i kontynuacja pozwolą ocenić, czy angażowanie osób bliskich pacjentowi, w tym partnerów, może stanowić znaczący komponent wsparcia społecznego, istotnie powiązanego z nasileniem symptomów CSBD i PPU. Literatura sugeruje, że nie tylko angażowanie bliskich osób w proces terapeutyczny (Love i in., 2016; Reid i Woolley, 2006), ale również uczestniczenie w terapii grupowej (Hook i in., 2008) lub grupach wsparcia (Fernandez i in., 2021; Tierens i in., 2014; Wnuk i Charzyńska, 2022) może przynosić potencjalnie pozytywne efekty w leczeniu CSBD i PPU.

Badania sugerują również, że dysregulacja emocjonalna może być użyteczną perspektywą w kontekście rozumienia mechanizmów CSBD i PPU (Lew-Starowicz i in., 2020). Dlatego niektóre podejścia psychoterapeutyczne, takie jak terapia dialektyczno-behawioralna (DBT; Linehan i in., 1999) czy terapia akceptacji i zaangażowania (ACT; Hayes i in., 2012), mogą okazać się skuteczne w leczeniu tych zaburzeń, ponieważ koncentrują się na rozwijaniu umiejętności radzenia sobie z trudnymi emocjami (Harvey i in., 2019; Hayes i in., 1996). Rzeczywiście, wstępne badania potwierdziły skuteczność ACT w leczeniu PPU (Crosby i Twohig, 2016).

Rola stylów przywiązania w kontekście CSBD i PPU podkreśla również znaczenie jakości sojuszu terapeutycznego – bezpieczna relacja z terapeutą może wspierać modyfikację dysfunkcyjnych wzorów przywiązania (Benfield, 2018; Gidhagen i in., 2018). Warto zauważyć, że w związkach romantycznych pozabezpieczne style przywiązania statystycznie przewidują negatywną interpretację otrzymywanego wsparcia oraz niższą jakość wsparcia udzielanego partnerowi (McLeod i in., 2020). Dlatego należy uwzględniać i badać czynniki wpływające na sposób postrzegania dostępnego wsparcia społecznego Kluczowe byłoby nie tylko nauczenie pacjentów nawiązywania i podtrzymywania bezpiecznych relacji, ale także modyfikacja schematów reagowania w już istniejących relacjach, co pozwoliłoby na

stopniową zmianę stylu przywiązania – tak jak ma to miejsce w terapii par skoncentrowanej na emocjach (EFT; Love i in., 2016; Reid i Woolley, 2006; Zitzman i Butler, 2009). Dla osób o lękowym stylu przywiązania istotnym elementem terapii może być nauka adaptacyjnego radzenia sobie z lękiem przed odrzuceniem, natomiast dla osób unikających – rozwijanie otwartości emocjonalnej.

Nasze badania wskazują również na konieczność uwzględniania specyfiki poszczególnych grup w procesie terapeutycznym. W przypadku osób należących do mniejszości seksualnych szczególnie pomocne mogą być interwencje ukierunkowane na radzenie sobie ze stresem mniejszościowym. Dotychczasowe badania sugerują, że wsparcie społeczne może łagodzić negatywne skutki stresu mniejszościowego ze względu na orientację seksualną – zjawisko to zostało potwierdzone m.in. w kontekście depresji (Safren i Heimberg, 1999), więc podobny mechanizm może być obecny również w odniesieniu do CSBD i PPU. Warto podkreślić, że w naszym badaniu wsparcie społeczne wiązało się z niższym nasileniem symptomów CSBD, podczas gdy w poprzednich badaniach osoby należące do mniejszości seksualnych deklarowały niższy poziom wsparcia oraz mniejszą satysfakcję z jego otrzymywania (Eisenberg i Resnick, 2006; Plöderl i Fartacek, 2005). Wsparcie społeczne może odgrywać kluczową rolę w skuteczności terapii, dlatego wzmacnianie systemów wsparcia w społecznościach LGBT+ może znacząco poprawiać efekty leczenia (Israel i in., 2008). Szczególne znaczenie może mieć wsparcie pochodzące od osób z tego samego kręgu LGBT+ (Doty i in., 2010; Frost i in., 2016).

Stres związany ze stygmatyzacją może przyczyniać się do zaburzeń w zakresie regulacji emocji, funkcjonowania społeczno-interpersonalnego oraz procesów poznawczych, które stanowią mechanizmy pośredniczące między tym stresem a rozwojem objawów psychopatologicznych (Hatzenbuehler, 2009). Sugeruje to, że poprawa funkcjonowania społecznego oraz zdolności do regulacji emocji może stanowić kluczowy cel terapeutyczny w

pracy z osobami należącymi do mniejszości seksualnych. W kontekście pracy z osobami LGBT+, które często doświadczają stresu mniejszościowego związanego z karaniem za autentyczność, pomocna może być funkcjonalna psychoterapia analityczna (FAP) – podejście oparte na analizie behawioralnej, wspierające zmiany w intymnych zachowaniach w relacjach z ważnymi osobami (Flentje i in., 2014).

Podsumowując, nasze badania wskazują na istotną rolę czynników społecznych i interpersonalnych w rozwoju oraz podtrzymywaniu objawów CSBD i PPU, a także na znaczenie dostosowania interwencji terapeutycznych do specyfiki różnych grup, w szczególności osób należących do mniejszości seksualnych.

W kolejnych częściach autoreferatu omówione zostaną ograniczenia przeprowadzonych badań oraz propozycje dalszych kierunków eksploracji. Warto zaznaczyć, że zarówno ograniczenia, jak i rekomendacje badawcze dotyczące eksplorowanego obszaru badawczego zostały szczegółowo przedstawione i uzasadnione w naszym artykule teoretycznym (A2, *Current Addiction Reports*), który stanowi syntezę wyników oraz przegląd aktualnego stanu wiedzy w tym obszarze.

Ograniczenia przeprowadzonych badań

Przeprowadzone badania posiadają kilka ograniczeń, które mogą wpływać na interpretację wyników, dlatego wnioski powinny być traktowane z ostrożnością. (1) Po pierwsze relacje społeczne i interpersonalne można konceptualizować na wiele różnych sposobów, których nie sposób objąć w ramach jednej rozprawy. W badaniach własnych uwzględniliśmy wybrane aspekty, takie jak postrzegane wsparcie społeczne, style przywiązania oraz stres mniejszościowy. Nie uwzględniliśmy natomiast innych istotnych wymiarów, które mogą wiązać się z objawami CSBD i PPU – takich jak jakość i satysfakcja z relacji, czas ich trwania, samotność czy izolacja społeczna (Daspe i in., 2018; Mestre-Bach i Potenza, 2023; Miner i in., 2016). Ograniczony format rozprawy wymagał rozsądnego

ograniczenia zakresu prac badawczych, jednak wskazane obszary stanowią ważny punkt wyjścia dla przyszłych badań. (2) Ponadto wszystkie badania miały charakter przekrojowy, co utrudnia wnioskowanie o związkach przyczynowo-skutkowych. (3) Ogólne cele badań i wykorzystane miary zostały prerejestrowane, ale nie prerejestrowaliśmy szczegółowych planów analiz wraz ze wszystkimi krokami, co jest kluczowe dla zasad otwartej nauki (Eben i in., 2023) i podniosłoby transparentność przeprowadzonych analiz. (4) Choć 3 z 4 przeprowadzonych badań opierały się na dużych próbach lub próbie reprezentatywnej, liczba osób w badaniu dotyczącym mniejszości seksualnych była ograniczona (n = 198) (Lewczuk, Wizła, Glica i Dwulit, 2023). Z tego powodu, np. w przypadku analiz dotyczących chemseksu, wnioskowanie należy przeprowadzać z ostrożnością, ponieważ stosunkowo niewielka grupa osób raportowała angażowanie się w aktywności seksualne pod wpływem substancji psychoaktywnych. Co więcej, choć jedna z prób była reprezentatywna dla populacji polskiej pod względem określonych norm socjodemograficznych (artykuł A4, *Journal of Psychiatric Research*) , to badanie miało charakter panelowy online, a udział mogły w nim wziąć jedynie osoby zarejestrowane w panelu badawczym. (5) Ponadto w badaniach wykorzystywaliśmy wyłącznie miary samoopisowe – nie dokonano obiektywnej oceny klinicznej, co utrudnia jednoznaczne określenie nasilenia symptomów CSBD i PPU w badanej próbie. (6) Niezgodność między poglądami moralnymi a zachowaniami seksualnymi może również prowadzić do częstszego postrzegania własnego korzystania z pornografii jako problematycznego (Grubbs i Perry, 2019; Lewczuk, Nowakowska i in., 2021), co nie było brane pod uwagę w badaniach własnych. (7) Ograniczeniem w przypadku badania postrzeganego wsparcia społecznego w grupach mniejszości seksualnych (Lewczuk, Wizła, Glica i Dwulit, 2023) może być również brak rozróżnienia między wsparciem specyficznym dla orientacji seksualnej a ogólnym, a także wsparcia pochodzącego z własnej grupy mniejszościowej od wsparcia pochodzącego z zewnątrz – w badaniach wykazywano, że mogą

mieć one odmienne działanie (Doty i in., 2010; Frost i in., 2016; Verrelli i in., 2019). (8) Dodatkowo badania zostały przeprowadzone wyłącznie w polskim kontekście kulturowym, podczas gdy występują międzykulturowe różnice w socjalizacji, co może wpływać na analizowane zmienne społeczne oraz ich związek z objawami psychopatologicznymi (Keller, 2013; Keller i Otto, 2009; Matsumoto i in., 2008; Rothbaum i in., 2000; van Ijzendoorn i Sagi-Schwartz, 2008; Vatan i Pellitteri, 2016; C. D. C. Wang i in., 2022). Ponadto sposób traktowania grup mniejszościowych różni się również między krajami, więc nasilenie stresorów specyficznych dla tych grup może być inne w zależności od kontekstu kulturowego (Kaufman i in., 2017). (9) W projekcie nie porównaliśmy również bezpośrednio grupy osób heteroseksualnych z grupą mniejszości seksualnych. Z tego powodu wnioskowanie na temat różnic pomiędzy tymi grupami jest ograniczone. (10) Dodatkowo omawiane dane zostały zebrane w czasie pandemii COVID-19, co mogło mieć wpływ na uzyskane wyniki. Dane dotyczące wpływu pandemii na symptomy CSBD i PPU są niejednoznaczne, a różnice mogą wynikać z czynników, które różnią się między krajami, takich jak np. surowość zasad dystansowania społecznego (Bőthe i in., 2022; Grubbs i in., 2022; Koós i in., 2022; Özmete i Pak, 2020; Xiong i in., 2020; Zattoni i in., 2020). (11) Ponadto w niektórych przypadkach nie zostały spełnione założenia regresji liniowej, jednak nie posiadamy nieparametrycznego odpowiednika tej analizy. Natomiast wtedy kiedy było to możliwe i wskazane, stosowaliśmy w analizach metody nieparametryczne.

Przyszłe kierunki badań

Wyniki naszych badań oraz ich ograniczenia wskazują możliwe dalsze kierunki badań. Aby określić kierunki zależności potrzebne są badania podłużne, a nie tylko przekrojowe, ponieważ możliwe są również zależności odwrotne – tzn. obniżona jakość relacji społecznych może być skutkiem CSBD i PPU, a niekoniecznie ją poprzedzać; przykładowo, u kobiet

obniżona intymność w relacji romantycznej była konsekwencją kompulsywnych zachowań seksualnych (Bőthe i in., 2021).

Należałoby również zbadać zarówno postrzegane, jak i otrzymywane wsparcie społeczne ze względu na jedynie umiarkowaną siłę ich korelacji (Haber i in., 2007). W naszych badaniach stosowaliśmy wyłącznie miary samoopisowe – w przyszłości warto byłoby zastosować różne metody zbierania danych. Potrzebne są także badania wśród osób poszukujących terapii oraz w populacjach klinicznych – obecnie z badań własnych otrzymujemy informacje o tym, że badane zmienne korelują ze sobą na poziomie populacji ogólnej i w grupie mniejszości seksualnych, a należałoby potwierdzić, czy związki te są również istotne dla populacji klinicznej. Wskazane byłoby prowadzenie wywiadów klinicznych i potwierdzenie spełnienia przez uczestników kryteriów diagnostycznych zgodnie z ICD-11 (WHO, 2022) i uwzględnianie w analizach rodzaju zachowań seksualnych, nad którymi występuje obniżona kontrola (tzn. wiodących zachowań problematycznych w obrazie CSBD). Wywiady kliniczne pomogłyby również odróżnić osoby, których cierpienie psychiczne w dużej mierze wynika z moralnej niezgodności między zachowaniami seksualnymi a przekonaniami jednostki. Obecnie nie dysponujemy miarami samoopisowymi, które pozwalałyby na wyodrębnienie tej grupy spośród osób, które prezentują kliniczny poziom objawów CSBD i PPU (Wizła i in., w recenzji). Aby zaadresować wyżej wspomniane ograniczenia przygotowujemy obecnie analizy na podstawie badań podłużnych, a także prowadzimy badania na próbie klinicznej, których następnym etapem będą wywiady diagnostyczne przeprowadzone przez ekspertów z dziedziny zdrowia psychicznego.

Kolejne badania z udziałem osób z mniejszości seksualnych powinny obejmować większą liczbę uczestników oraz porównania z populacją ogólną, co pozwoliłoby określić różnice w rozpowszechnieniu CSBD i PPU w populacji polskiej. Bardziej liczne próby umożliwią również rzetelną analizę zjawisk stosunkowo rzadkich, takich jak np. chemseks.

Potrzebne są także badania dotyczące mniejszości płciowych w Polsce (w naszych analizach dotyczących stresu mniejszościowego uwzględniliśmy jedynie osoby cispłciowe) oraz szczegółowe rozgraniczenie wpływu stresorów mniejszościowych i zmiennych psychoseksualnych związanych z przynależnością do mniejszości seksualnej lub płciowej (Lewczuk, Wizła, Glica i Dwulit, 2023). Pozwoli to między innymi na identyfikację specyficznych czynników ryzyka i ochronnych w różnych grupach.

Ze względu na potencjalny wpływ pandemii i dystansowania społecznego na zachowania seksualne (Grubbs i in., 2022; Xiong i in., 2020; Zattoni i in., 2020), należy przeprowadzić badania poza tym kontekstem, aby wyeliminować wpływ tych czynników sytuacyjnych i sprawdzić stabilność uzyskanych wyników w innych warunkach społecznych. Powinniśmy również rozszerzyć pomiar wsparcia społecznego, uwzględniając jego specyfikę – np. wsparcie ogólne lub związane z seksualnością (Doty i in., 2010), a w przypadku grup mniejszościowych – wsparcie od innych członków grupy mniejszościowej lub wsparcie spoza tej grupy. W przypadku osób należących do mniejszości seksualnych konieczne jest również uwzględnienie bardziej złożonych wzorców wsparcia – między innymi zróżnicowania między wsparciem otrzymywanym od rodziny pochodzenia a tym pochodzącym od tzw. rodziny z wyboru (Breder i Bockting, 2023; Soler i in., 2018). W przypadku tej grupy, w odniesieniu do stresu mniejszościowego, narzędzie, które wykorzystaliśmy do pomiaru stopnia ujawnienia własnej orientacji seksualnej (*Outness Inventory*; Mohr i Fassinger, 2000), nie uwzględnia stopnia ujawnienia się wobec społeczności mniejszościowej, co również może być istotnym wskaźnikiem struktury sieci społecznych.

W przypadku stylów przywiązania, istotna wydaje się również interakcja stylu jednostki i postrzeganego lub rzeczywistego stylu przywiązania partnera; interakcja ta była na przykład związana z koregulacją w parze (Butner i in., 2007). Dane z naszego kolejnego badania, które uwzględnia te zmienne, są obecnie na etapie analiz statystycznych. Warto

również zbadać związki między stylami przywiązania a postrzeganym i otrzymywanym wsparciem społecznym, ponieważ pozabezpieczny styl przywiązania wiąże się z negatywną interpretacją i gorszą jakością oferowanego wsparcia (McLeod i in., 2020) oraz osłabia negatywny związek między wsparciem a cierpieniem psychicznym (Moreira i in., 2003).

Wyniki naszych badań powinny zostać zreplikowane w innych kontekstach kulturowych, ponieważ eksplorowane zmienne, takie jak zachowania seksualne (Agocha i in., 2013; Fugère i in., 2008; Guo, 2019), CSBD (Bőthe i in., 2023), style przywiązania (Keller, 2013; Rothbaum i in., 2000; van Ijzendoorn i Sagi-Schwartz, 2008), regulacja emocji (Keller i Otto, 2009; Matsumoto i in., 2008) czy ich związki z objawami psychopatologicznymi (Vatan i Pellitteri, 2016; C. D. C. Wang i in., 2022), mogą zależeć od czynników kulturowych. W różnych krajach CSBD i PPU mogą mieć odmienne uwarunkowania – w społeczeństwach o bardziej restrykcyjnych normach problem może być nasilany na przykład przez poczucie winy i wstydu (Adams i Robinson, 2001; Gilliland i in., 2011; Sassover i in., 2021). W badaniach należy również uwzględniać inne czynniki związane z objawami CSBD i PPU, takie jak satysfakcja ze związku, samotność i izolacja społeczna (Cardoso i in., 2023; Chaney i Burns-Wortham, 2015; Wéry i in., 2020), strategie radzenia sobie z emocjami (Rahm-Knigge i in., 2023), wiek inicjacji seksualnej (Lewczuk, 2024), czy korzystanie z aplikacji randkowych (Lewczuk, 2024; Obarska i in., 2020). Nasze badanie dotyczące stylów przywiązania powinno także zostać przeprowadzone na próbie reprezentatywnej dla dorosłej populacji w Polsce.

Niezwykle istotne jest również zbadanie potencjału aplikacyjnego wyników naszych badań. Badania wykazują możliwość modyfikacji stylów przywiązania w terapii (Travis i in., 2001) – warto więc eksplorować ten potencjał w odniesieniu do CSBD i PPU, a także dalszych badań w kontekście strategii regulacji emocji i interwencji opartych na uważności (np. ACT, DBT) w łagodzeniu objawów CSBD i PPU (Crosby i Twohig, 2016; Harvey i in.,

2019). Nasze wyniki mogłyby być również użyteczne w projektowaniu strategii prewencyjnych ukierunkowanych na wzmacnianie więzi. Przykładowo, w badaniach nad hazardem zaangażowanie w społeczności wspierające hazard okazało się czynnikiem ryzyka dla zaburzenia związanego z uprawianiem hazardu (Oksanen i in., 2021), co doprowadziło do sugestii, że tworzenie społeczności edukujących o szkodliwości hazardu mogłoby stanowić skuteczną formę prewencji. Warto również zwrócić uwagę na to, że mężczyźni z mniejszości seksualnych często zgłaszali, iż zakończenie bliskich relacji stanowiło czynnik wyzwalający nawrót CSBD (Parsons i in., 2007). Osoby, które czują się samotne lub nie mają wsparcia, częściej wracają do kompulsywnych zachowań seksualnych jako mechanizmu radzenia sobie z emocjami, co może zwiększać ryzyko nawrotów (Cardoso i in., 2023; Wéry i in., 2020). Wiedza na temat wpływu stresu mniejszościowego wśród osób z mniejszości seksualnych powinna zostać uwzględniona przy dostosowywaniu terapii do specyfiki tych grup.

Podsumowanie

Przeprowadzony cykl badań dostarcza nowych i istotnych danych na temat roli czynników społecznych w rozwoju oraz przebiegu CSBD i PPU. Potwierdzono, że czynniki społeczne – takie jak pozabezpieczne style przywiązania, postrzegane wsparcie społeczne oraz stres mniejszościowy – odgrywają znaczącą rolę w nasileniu objawów tych zaburzeń. W szczególności stres mniejszościowy okazał się istotnym czynnikiem ryzyka w grupie osób z mniejszości seksualnych, co podkreśla konieczność dostosowania interwencji terapeutycznych do specyfiki doświadczeń tych grup. Kluczowe mogą być dla nich interwencje skoncentrowane na budowaniu akceptacji siebie, redukcji stygmatyzacji wewnętrznej oraz wzmacnianiu poczucia przynależności i wsparcia społecznego (Pachankis i in., 2015).

W przeszłości sugerowano, że trudności w nawiązywaniu i utrzymywaniu satysfakcjonujących relacji interpersonalnych mogą stanowić kluczowy mechanizm rozwoju

CSBD i PPU (Adams i Robinson, 2001; Leedes, 1999; Riemersma i Sytsma, 2013; Schwartz i Southern, 2017; Zapf i in., 2008). Wraz z rozwojem nowych technologii, upowszechnieniem Internetu, aplikacji randkowych oraz zmianami w obyczajach seksualnych, czynniki środowiskowe związane z łatwym dostępem do bodźców seksualnych – zwłaszcza treści pornograficznych online – zaczęły odgrywać coraz bardziej centralną rolę w rozwoju CSBD i PPU (Hall, 2013; Obarska i in., 2020). W rezultacie rola więzi społecznych została częściowo przesunięta na dalszy plan. Niemniej, uzyskane wyniki wskazują, że nie można jej pomijać – szczególnie w kontekście leczenia i profilaktyki CSBD i PPU. Jeśli zachowania związane z CSBD i PPU rzeczywiście są formą zastępczego budowania więzi (zachowania takie jak np. nadmierne korzystanie z pornografii, cyberseks czy anonimowe kontakty seksualne) (Leedes, 1999, 2001) – to klasyczne interwencje terapeutyczne skupiające się wyłącznie na kontroli impulsów mogą nie być wystarczające (Schwartz i Southern, 2017). Na szczególną uwagę zasługuje fakt, że uzyskane przez nas zależności — choć cechowały się niewielką lub umiarkowaną siłą — występowały przy statystycznej kontroli innych ważnych czynników, tzn. istotnych zmiennych socjodemograficznych oraz częstotliwości zachowań seksualnych, co podkreśla ich istotną rolę w wyjaśnianiu CSBD i PPU.

Mimo zauważalnych związków między zmiennymi społecznymi a objawami CSBD i PPU, dostępne badania – głównie przekrojowe – nie pozwalają na wyciągnięcie wniosków o charakterze przyczynowo-skutkowym (Wizła i Lewczuk, 2024a). Konieczne są badania podłużne i eksperymentalne, a także na próbach klinicznych, które pozwolą lepiej zrozumieć złożoną, prawdopodobnie dwukierunkową naturę tych zależności. Potrzebne są również dane pochodzące z międzynarodowych, wieloośrodkowych projektów badawczych, prowadzonych według ujednoliconych metodologii oraz z większym uwzględnieniem zasad otwartej nauki (Eben i in., 2023).

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ORIGINAL PAPER

The Associations Between Attachment Insecurity and Compulsive Sexual Behavior Disorder or Problematic Pornography Use: The Mediating Role of Emotion Regulation Difficulties

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Abstract
Compulsive sexual behavior disorder (CSBD) was previously considered an attachment disorder, while emotion dysregulation was thought to potentially be a key characteristic of it. However, this theoretical model was not tested in previous empirical research. In our cross-sectional study, we tested whether emotional regulation (ER) difficulties can be adopted as an explanatory mechanism for the relationships between attachment avoidance and anxiety, as well as CSBD and its most prevalent behavioral presentation—problematic pornography use (PPU). Participants ($n = 1002$; $M_{age} = 50.49$ years, $SD = 13.32$; men: 50.2%) completed an online survey regarding the investigated variables. In mediation analyses, attachment avoidance and anxiety were treated as simultaneous predictors, ER difficulties as a mediating variable, with CSBD/PPU severity as dependent variables. Emotion regulation difficulties and attachment anxiety had a direct positive effect on both CSBD and PPU. The direct effect of attachment avoidance on PPU was non-significant, and significant for CSBD depending on the measure used. Moreover, all the relationships between both insecure attachment dimensions and CSBD/PPU symptom severity were at least partially mediated by ER difficulties. Our results corroborate the theoretical claim that ER difficulties may be a useful framework for explaining the impact of attachment insecurity on CSBD/PPU. Theoretical and practical implications of the findings are discussed.

Keywords Compulsive sexual behavior disorder · Problematic pornography use · Emotion regulation · Attachment anxiety · Attachment avoidance · ICD-11

Introduction

Compulsive sexual behavior disorder (CSBD) is conceptualized as the inability to control persistent urges, thoughts, and behaviors in the sexual domain (Kraus et al., 2018; World Health Organization [WHO], 2022a). Compulsive sexual behavior disorder was previously considered an attachment disorder (Flores, 2004; Gilliland et al., 2015; Zapf et al., 2008), while emotion dysregulation was thought to be an important characteristic of it (Gola et al., 2022; Lew-Starowicz et al., 2020). This manuscript aims to explain the link between attachment insecurity and CSBD symptoms by adopting an explanatory mechanism of emotion regulation (ER) difficulties.

The five diagnostic criteria of CSBD as proposed in the ICD-11 (WHO, 2022b) regard (1) preoccupation with the sexual domain to the point it leads to (2) negative consequences and (3) impairment in other areas of life. Moreover, an individual experiencing CSBD (4) will have undertaken unsuccessful attempts to refrain from or limit sexual behaviors and (5) continues engagement in sexual activities despite lack of or diminished sexual satisfaction. The most prevalent behavioral presentation of CSBD is problematic pornography use (PPU) (up to 80%, e.g., Kraus et al., 2018) which is characterized by excessive and uncontrollable pornography use that is frequently employed as a coping strategy to deal with difficult emotions (e.g., de Alarcón et al., 2019; Fernandez & Griffiths, 2021; Wéry & Billieux, 2017). Compulsive sexual behavior disorder extends beyond PPU and refers to other out-of-control non-paraphilic sexual behaviors

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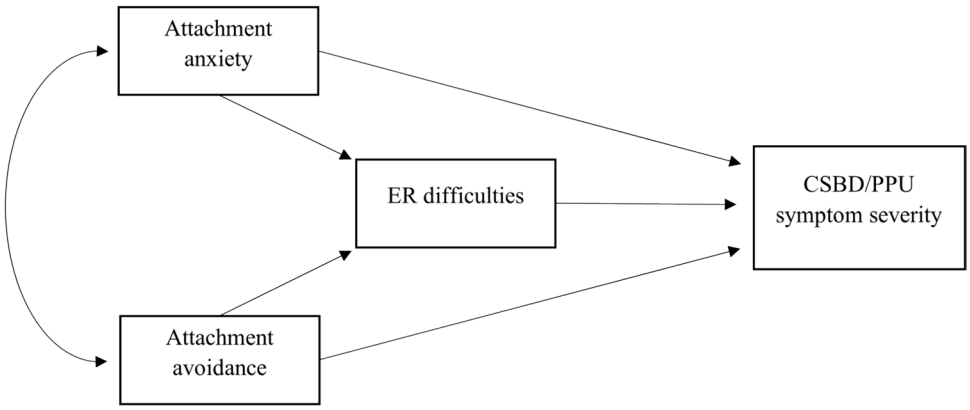

Fig. 1 Conceptual diagram: mediation model of relationships between attachment anxiety, attachment avoidance, and compulsive sexual behavior disorder or problematic pornography use. ER—emotion regulation; CSBD—compulsive sexual behavior disorder; PPU—problematic pornography use

encompassing, for example, uncontrollable masturbation, excessive use of paid sexual services, and numerous casual sexual partners.

Compulsive sexual behavior disorder may be used as an umbrella term for possible subtypes of the disorder characterized by different behavioral presentations with various types of sexual behaviors (see Antons & Brand, 2021). The hypersexual disorder was CSBD's proposed predecessor but was finally not included in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013). Compulsive sexual behavior has also been conceptualized and researched as, among others, sexual addiction (Carnes, 1983; Griffiths, 2019), sexual compulsivity (Coleman, 1987; Kalichman & Rompa, 1995), or sexual impulsivity (Barth & Kinder, 1987). For the sake of consistency, we refer to all its previous conceptualizations as CSBD in accordance with the current classification in ICD-11 (WHO, 2022a, 2022b).

Although it was not ultimately included in the diagnostic criteria for CSBD, emotion dysregulation seems to potentially be an important factor in CSBD development and maintenance (see Gola et al., 2022; Lew-Starowicz et al., 2020) and has been postulated to be a core feature in previous conceptualizations of CSBD (e.g., Goodman, 1993; Kafka, 2010; Walton et al., 2017). The theory of attachment (Bowlby, 1977) posits that, during interactions with primary attachment figures, an individual develops a set of cognitive schemas about self and others, expectations, and strategies aimed at regulating proximity to others. Effective emotion regulation is one aspect of functioning shaped by the attachment figure's responsiveness. The perception of emotion dysregulation as a product of insecure attachment styles leading to CSBD symptoms is suggested as a useful conceptual framework for understanding the disorder (Lew-Starowicz et al., 2020). In the current paper, we propose an empirically based model showing emotion regulation difficulties stemming from insecure attachment styles and how they contribute to CSBD and PPU symptom severity (see Fig. 1).

Compulsive Sexual Behavior Disorder and Emotion Regulation

ER is defined as a process that an individual employs to influence the kind of emotions they feel and when, as well as how they experience and express them (Gross, 1998, 2002, 2014). The key role of emotion dysregulation in CSBD development and maintenance has been highlighted in its all major conceptualizations (Bancroft & Vukadinovic, 2004; Carnes, 1983; Goodman, 1993; Kafka, 2010; Walton et al., 2017). The diagnostic criteria of hypersexual disorder (CSBD's predecessor, proposed for but ultimately not included in the DSM-5) included using sexual behaviors as a coping strategy, i.e., engaging in sexual activities in response to dysphoric mood states and stressful life events (Kafka, 2010). The current conceptualization of CSBD, as well as the instruments used for its assessment, is based on the ICD-11 criteria (WHO, 2022a) that do not include this criterion. Whether emotion dysregulation should be a diagnostic criterion for CSBD is, however, still under discussion (Gola et al., 2022).

Although the role of ER difficulties in CSBD is highlighted in the theoretical models, the empirical data on their associations is limited. It has been suggested that proneness to negative affect and difficulty in identifying and managing emotions can lead to employing hypersexual behavior as a coping mechanism in men seeking help for CSBD (Reid et al., 2008). For men with CSBD maladaptive coping strategies were adopted more frequently (Engel et al., 2019), while maladaptive shame coping predicted the severity of CSBD (Reid et al., 2011) which supports the hypothesis that CSBD

can be used as an ER method. Also, among patients with substance use disorder (Hashemi et al., 2018) and highly sexually active men who have sex with men (MSM) (Pachankis et al., 2014), difficulties with ER were positively associated with hypersexual symptoms. The literature supports the existence of significant relationships between ER difficulties and CSBD, however, it is important to emphasize that in our study search, we did not come across data showing how ER difficulties relate to CSBD in female samples.

Attachment and Emotion Regulation

According to Bowlby's (1977) theory attachment is an instinct that can be described as "any form of behaviour that results in a person attaining or retaining proximity to some other differentiated and preferred individual" (p. 204). The most distinctive dimension characterizing attachment is not its strength but security vs. insecurity in the relationship (Ainsworth et al., 2015). Attachment anxiety and avoidance are two separate dimensions of attachment insecurity that determine different attachment behaviors (Brennan et al., 1998; Fraley et al., 2000). Attachment avoidance is associated with the fear of intimacy, interdependence, and emotional openness; while attachment anxiety is more strongly related with the fear of insufficient love or abandonment (Crowell et al., 2008). In line with this, avoidant attachment is related to deactivating ER strategies to alleviate distress resulting from frustration in interactions with a distant or rejecting attachment figure (Shaver & Mikulincer, 2007). On the other hand, anxious attachment is associated with hyperactivating ER strategies that develop as a way of catching the attention of the attachment figure to obtain soothing. Avoidantly attached individuals aim to dissociate from their emotions and are less focused on them which results in difficulties identifying emotions, while anxiously attached individuals are more aware of their emotions, but also have problems with clarifying them (Stevens, 2014). Moreover, anxious attachment was more often associated with engaging in impulsive behaviors and emotional interference with goals.

Attachment Insecurity and Compulsive Sexual Behavior Disorder

Addiction may be considered a key symptom of attachment disorder (Flores, 2004). The same hypothesis was put forward for CSBD (e.g., Gilliland et al., 2015; Riemersma & Sytsma, 2013; Zapf et al., 2008) which could be perceived as a maladaptive strategy of affect regulation (Katehakis, 2009). Emotion regulation difficulties, in turn, stem from insecure attachment which is shaped by the inappropriate responsiveness of the caregiver (Katehakis, 2009).

A wide body of empirical evidence supports the existence of significant relationships between attachment insecurity and a higher possibility as well as a greater severity of CSBD (shared variance from 5 to 21%; see Efrati et al., 2022). A study on adolescents who presented CSBD symptoms showed that they significantly more often presented attachment anxiety (Efrati & Amichai-Hamburger, 2021; Efrati & Gola, 2018). As much as 95% of individuals diagnosed with sexual addiction showed characteristics of an anxious or avoidant attachment (Leedes, 1999a; Zapf et al., 2008). Men who sought treatment for CSBD reported secure attachment less frequently, while insecure styles were reported more often (Gilliland et al., 2015). Attachment anxiety and avoidance were also positively correlated with sexual compulsivity (Weinstein et al., 2015) and predicted hypersexual behavior for both heterosexual and homosexual men and women (Ciocca et al., 2021). Notably, the difference was predominantly explained by the factor reflecting the use of sexual behavior as a coping strategy for difficult emotions. Moreover, anxious attachment was a more powerful predictor of CSBD than the frequency of online and offline sexual activity (Efrati & Gola, 2018). Research remains inconsistent regarding which attachment insecurity dimension is a more powerful predictor of CSBD, with some pointing to avoidance (e.g., Crocker, 2015) and some to anxiety (e.g., Giordano et al., 2017; Kircaburun et al., 2023). Findings by Faisandier et al. (2012) point to a stronger association between attachment and out-of-control sexual behaviors in women than in men.

Anxious and Avoidant Attachment Associations with Compulsive Sexual Behavior Disorder

Both attachment dimensions exhibit distinct characteristics; however, they both positively contribute, as outlined in our literature review, to the severity of CSBD and PPU. The precise nature of the mechanisms underlying this phenomenon—where different characteristics predict the same disorder—remains understudied. To the best of our knowledge, existing research does not permit definite conclusions based on empirical data to be drawn in this field. The approach could be twofold: two divergent paths leading through different mechanisms to the same behaviors, or it may be possible that different dimensions predict various behavior patterns (Varfi et al., 2019). The associations may also be explained by the type of needs that the sexual behavior serves to satisfy; attachment anxiety was associated with fulfilling emotional needs, while attachment avoidance with sexual ones (Saint-Eloi Cadely et al., 2020).

Individuals high in attachment anxiety are characterized by hyperregulating ER strategies leading to the intensification of negative emotions (Crowell et al., 2008). Such escalation of negative affect may lead to more frequent casual encounters in search of closeness or intimacy to ease them. However, casual sexual encounters may lack closeness which could

be interpreted as rejection by an anxious individual, which would further intensify the difficult emotions in line with the hyperregulation assumption. Another explanation for engagement in casual sexual encounters may be an attempt to upregulate positive emotions. On the other hand, individuals high in attachment anxiety could engage in solitary sexual activity to cope with the difficult emotions that have been hyperregulated. Another reason for engaging in such activities could be to cope with feelings of abandonment and loneliness (see Mestre-Bach & Potenza, 2023).

A person high in attachment avoidance is characterized by emotion hyporegulation mostly employing deactivating ER strategies (Crowell et al., 2008). They fear intimacy and avoid bonding with others (Samenow, 2010; Weinstein et al., 2015; Zapf et al., 2008). It would mean that they might engage in casual sexual encounters to avoid forming intimate bonds or as a substitute for a close relationship (Leedes, 1999b, 2001). Pornography use or masturbation may serve the same purpose. For instance, teenagers who only engaged in sex online were higher in avoidance than those who engaged in both online and offline activities (Efrati & Amichai-Hamburger, 2021). Another reason for pornography use may be to escape difficult emotions (de Alarcón et al., 2019).

As explained above, the possible pathways that explain the associations between the two dimensions of insecure attachment and CSBD are manifold and complex. It seems that these relationships can be explained by studying the underlying mechanisms because, on the surface level both dimensions can be linked to the same behaviors (as also indicated by the literature review, showing no unequivocal differences in the predictive strength of anxiety and avoidance in relation to CSBD). The explanation of these associations needs to be disentangled in the future, based on further, more complex studies exploring the discussed mechanisms. However, this is beyond the scope of the current paper.

Present Study

The literature review provides evidence for the associations of attachment styles, ER difficulties, and the development of CSBD and PPU. In addition, attachment theory is postulated to be a useful conceptual framework for explaining emotion dysregulation and the development of CSBD (see Lew-Starowicz et al., 2020), while CSB/PPU used as a means of coping with negative emotions and stress is considered to be a possible important characteristic of CSBD (Gola et al., 2022). Despite the data pointing to possible interconnections, to the best of our knowledge, no research has studied the formerly mentioned relationships between attachment insecurity, and CSBD or PPU symptom severity by employing ER difficulties as the mechanism explaining the links between insecure attachment and CSBD/PPU. In our study, we aimed to investigate how attachment insecurity (both anxiety and avoidance separately) predicts CSBD and PPU and how those relationships are mediated by ER difficulties. Next, as the current criteria for CSBD were recently introduced (WHO, 2022a), research on the assessment of and screening for the disorder symptoms is also in its initial phases, and comparative research juxtaposing available CSBD screening methods is lacking. Another issue is the possible overpathologization of normative sexual behavior (Billieux et al., 2015) as the existing measures yield presumably overestimated rates of people at high risk of CSBD/PPU (e.g., Lewczuk et al., 2023b). Due to this, a secondary aim of our investigation was to investigate whether the results obtained with two recently developed instruments assessing CSBD symptoms, that is, Compulsive Sexual Behavior Disorder-Diagnostic Inventory (CSBD-DI; Grubbs et al., 2023) and Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bőthe et al., 2020a), are equivalent (or the results regarding the relationships between attachment and CSBD depend on the measure used). Both instruments were developed relatively recently and neither of them has a long-standing history of research supporting its reliability and validity. They are the only existing assessment tools based on the prevailing criteria for CSBD in accordance with ICD-11 (WHO, 2022b). However, there are very significant differences in the structure of scales, which reflect underlying differences in how these scales approach CSBD symptoms. The measures differ in the proportion of items reflecting each criterion which means a different weight is given to each criterion in CSBD-19 and CSBD-DI; as a result, specific criteria influence the overall score of the questionnaire differently. Another distinctive feature of the questionnaires is the scoring method: CSBD-19 (Bőthe et al., 2020a) employs a Likert scale that reflects the intensity of symptoms in the past 6 months, whereas CSBD-DI (Grubbs et al., 2023) only considers the fulfillment of the criterion during the same timeframe. Comparative studies of assessment instruments are crucial not only in a clinical context but also in research. This is important as it enables the simplification of procedures, taking into account respondents' limited attention span, if both measures yield comparable results. Moreover, taking into account the relatively early stage of development of the two instruments, by comparing the outcomes yielded by these two scales, we can ensure that the obtained results do not depend on the specific scale used to assess CSBD, but are due to the underlying severity of CSBD symptoms. Thus, comparative research juxtaposing the two scales is of vital importance.

Not only is it important to contribute to existing knowledge by explaining the mechanisms behind previously studied relationships, but also by creating a mediation model that combines them in one framework. This approach provides a more comprehensive perspective that has previously only been theorized (Lew-Starowicz et al., 2020). These relationships pertain to difficulties with emotion regulation,

attachment insecurity, and symptoms of PPU/CSBD. Additionally, in light of the replication crisis, especially in clinical psychology (Tackett & Miller, 2019; Tackett et al., 2019), and the field of behavioral addictions investigations (Eben et al., 2023), replicating the results is crucial. This is particularly important as, to our knowledge, our study is the first regarding attachment insecurity, and CSBD and PPU symptoms conducted in the Polish cultural context. Consequently, its significance results from the dependence of CSBD and PPU symptoms on cultural factors (Bőthe et al., 2023). Not only are attachment (Keller, 2013; Rothbaum et al., 2000; van Ijzendoorn & Sagi-Schwartz, 2008) and emotion regulation abilities (Keller & Otto, 2009; Matsumoto et al., 2008) sensitive to cultural differences in socialization, but also relationships between attachment, emotion regulation, and psychopathological symptoms can differ in various cultural contexts (Vatan & Pellitteri, 2016; Wang et al., 2022).

Based on the current knowledge, we hypothesize that both dimensions of insecure attachment, anxiety and avoidance, will have a direct positive effect on CSBD (effect of anxiety—Hypothesis 1 (H1); avoidance—H2) and PPU (anxiety—H3; avoidance—H4) symptom severity. Moreover, we presume that ER difficulties will have a direct positive effect on CSBD (H5) and PPU (H6) symptom severity. Another group of hypotheses regards the significant mediation of the relationship between attachment insecurity and CSBD and PPU symptom severity by difficulties with ER, at least a partial mediation of the relationship between attachment anxiety and CSBD (H7) as well as PPU (H8) by ER difficulties, and at least a partial mediation of the relationship between attachment avoidance and CSBD (H9) as well as PPU (H10) by ER difficulties.

As the likelihood of being affected by CSBD and PPU, their symptom severity and presentation can differ depending on age (e.g., Grubbs et al., 2019; Lewczuk et al., 2023b, 2023c), gender (e.g., Lewczuk et al., 2017; see also Kowalewska et al., 2020, 2022), sexual orientation (Edmundson et al., 2018), relationship status (e.g., Kumar et al., 2021; Lewczuk et al., 2023c), or the frequency of sexual behaviors (e.g., Chen et al., 2022; Lewczuk et al., 2023a, 2023b; see also Bőthe et al., 2020a, 2020b), we decided to include these variables in our analyses.

How Emotion Regulation Difficulties Can Mediate the Relationship Between Compulsive Sexual Behavior Disorder/Problematic Pornography Use Symptoms and Attachment Insecurity

Based on the literature review, attachment appears to be a preceding predisposition, shaped earlier in life, that can influence emotion regulation strategies in later life. Specifically, within its theoretical framework, attachment development is associated with learning strategies that regulate proximity to others (Bowlby, 1973, 1977). Interaction with significant others and their specific responses can shape the way a child regulates their emotions to facilitate bonding with the attachment figure. Attachment, being a construct with emotional components, naturally aligns closely with regulatory strategies and attachment theory is claimed to be one of the most significant theories explaining affect regulation (Mikulincer et al., 2003). The self-regulation model expands on the theory proposed by Bowlby (1973, 1977) by integrating it with dialectical philosophy and presents addiction as an impairment of self-regulation (Padykula & Conklin, 2010). Moreover, longitudinal studies indicate that early experiences of children with their caregivers influence their emotional abilities in adolescence (Fletcher et al., 2015). Infants' attachment predicts attachment-relevant emotion regulation strategies (Girme et al., 2021) and underlying neural processes during the regulation of positive emotions (Moutsiana et al., 2014) in adulthood. The seemingly developmentally preceding nature of attachment, serving as a learning environment for the development of specific ER difficulties (Shaver & Mikulincer, 2007; Stevens, 2014), justified the inclusion of ER difficulties as a mediator in our models.

Moreover, the mediating role of problems with ER in the relationship between attachment insecurity and psychopathological symptoms has been shown for most major psychiatric symptom classes: depressive symptoms (see Malik et al., 2015), PTSD severity (Benoit et al., 2010), binge eating behaviors (Shakory et al., 2015), or vegetative, agoraphobic, social phobia symptoms and global symptom severity index (Lewczuk et al., 2021a, 2021b). Both the relationship (1) between the independent variable (attachment avoidance or anxiety) and the mediator (ER difficulties), as well as (2) between the mediator (ER difficulties) and the dependent variable (CSBD or PPU symptom severity) have a very strong grounding in the literature—thus, a mediation model and not a moderation model was evaluated. However, the results need to be treated with caution because the reported data stems from cross-sectional and longitudinal studies. The moderating nature of ER difficulties may also be possible; for example, adaptive ER strategies were found to moderate the relationship between attachment and behavioral addictions in adolescents, while maladaptive strategies mediated it (Estevez et al., 2019). Therefore, as a part of additional analyses, we analyzed moderation models in which ER difficulties were placed in the role of a moderator of attachment—CSBD/PPU relationships. The results showed that none of the tested moderation effects were significant in any of the analyzed models (see Supplementary material).

Method

Participants and Procedure

The study was conducted via the Pollster research platform (https://pollster.pl/). Users registered on the platform participate in different studies collecting points that can later be exchanged for money or donated to a chosen organization (PanelBook 2023, 2024). All the measures included in our survey and general study aims have been preregistered and are available under the following link: https://osf.io/ywceq. Moreover, two questions checking the attention of participants were included in the survey and had to be answered correctly for the responses to be accepted. We received from the external data provider dataset comprising 1003 participants who completed all the measures relevant to our study—as a result, we have no knowledge about how many participants started (clicked the survey link) but did not complete the study. We excluded from the analyses one participant, as they did not specify their gender, resulting in a final sample of 1002 participants. Data was collected from June to July 2022. All the participants had previously taken part in one of two other studies from preceding years (2019 and 2020) conducted by our team.

The investigated sample includes 1002 Polish participants (M_{age} = 50.49 years, SD = 13.32), 503 of which were men (M_{age} = 51.71, SD = .56) and 499 women (M_{age} = 49.25, SD = 13.87). In terms of sexual orientation, the majority of participants (92.71%; n = 929) identified themselves as heterosexual, 3.19% (n = 32) as bisexual, 2.89% (n = 29) as homosexual, 0.20% (n = 2) as asexual, 0.10% (n = 1) as pansexual, and 0.09% (n = 9) chose the response option "other". Regarding romantic relationships, the majority of participants (59.18%; n = 593) reported being in a formal relationship (married), 17.96% (n = 180) were in an informal relationship, and 22.85% (n = 229) were single. Participants were asked to complete a set of online measures regarding sociodemographic characteristics, attachment anxiety and avoidance, emotion regulation difficulties, CSBD, and PPU symptom severity.

Measures

The Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bőthe et al., 2020a, Polish adaptation: Bőthe et al., 2023) was used to assess the severity of CSBD symptoms. It is a 19-item (α = .94; ω = .94) scale with response options for each item ranging from 1 (Completely disagree) to 4 (Completely agree); sample item: I did not accomplish important tasks because of my sexual behavior. The general score was obtained from the sum of the items.

The Compulsive Sexual Behavior Disorder-Diagnostic Inventory (CSBD-DI; Original instrument and Polish adaptation: Grubbs et al., 2023) was another measure that we used for CSBD symptom severity assessment. It is a 9-item scale (α = .82; ω = .83) with three response options: two scored 0 (This has been true in my lifetime but not during the last 12 months and This has never been true of me), and one scored 1 (This has been true for at least 6 months during the last 12 months); sample item: I often engage in sexual behavior despite the risk of physical harm (e.g., sexually transmitted infection, unintended pregnancy, injury, or illness, etc.). The general score denoting the severity of CSBD symptoms was derived from the sum of responses from the first to seventh item (α = .76; ω = .77).

The Brief Pornography Screen (BPS; Kraus et al., 2020; Polish adaptation: Bőthe et al., 2023) was employed for the assessment of PPU symptom severity. The tool entails five items (α = .86; ω = .87) with the following response scale: 0 (*Never*), 1 (*Sometimes*), and 2 (*Frequently*); sample item: You continue to use pornography even though you feel guilty about it. The general score was calculated as the sum of the items.

The Experiences in Close Relationships-Revised (short version) (Fraley et al., 2000; Polish adaptation: Lubiewska et al., 2016) was used to measure insecure attachment dimensions: attachment anxiety and avoidance. The scale comprises 16 items with a response scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The questionnaire has two 8-item subscales (1) attachment anxiety (α = .93; ω = .93), sample item: I often worry that my partner will not want to stay with me, (2) attachment avoidance (α = .89; ω = .89), sample item: I prefer not to be too close to romantic partners. The scores of the subscales were calculated as means of the items.

The Difficulties in Emotion Regulation Scale-Short Form (DERS-SF; Kaufman et al., 2016; Polish experimental version by Paweł Holas) is an instrument for the measurement of difficulties with emotion regulation we used. The scale is the short 18-item (α = .90; ω = .95) version of The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).[1] It measures difficulties referring to 6 domains: nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to ER strategies, and lack of emotional clarity. The response scale ranged from 1 to 5 (1—*Almost Never* to 5—*Almost always*); sample item: When I'm upset I take time to figure out what I'm really feeling. In our analyses, we used only the general score expressed as the mean of all the items.

[1] The provided McDonald's omega coefficient was calculated after items comprising the Awareness subscale were excluded due to negative correlations with other items of the measure. The issue is further elaborated on at the end of the Measures section.

Participants were also asked to indicate the frequency of various sexual activities in the past 12 months: pornography use, masturbation, and sexual intercourse (Grubbs et al., 2019; Lewczuk et al., 2021a, 2021b; Wizła et al., 2022). The responses ranged from 0 to 7 (0—*never* to 8—*once a day or more often*).

We also adjusted for participants' age, gender (dichotomous variable: 0—woman, 1—man), sexual orientation (coded dichotomously: 0—sexually diverse, 1—heterosexual), and relationship status (2 dummy variables with single being the reference group: in an informal relationship and a formal relationship [married]).

Reliability coefficients for all the used measures presented acceptable values of Cronbach's alpha and McDonald's omega (McDonald, 1970; McNeish, 2018; Nunnally, 1978). Apart from adequate coefficient values for CSBD-DI (Grubbs et al., 2023), the other coefficients demonstrated good to excellent reliability, with values over .85. The only tool for which McDonald's omega could not be calculated because of negative correlations among some items was DERS-SF (Kaufman et al., 2016). Negative correlations were found for the Awareness subscale; a similar issue has previously been reported and the exclusion of items comprising this subscale may be suggested (e.g., Fowler et al., 2014; Gouveia et al., 2022; Moreira et al., 2022). Therefore we repeated the mediation analyses excluding the items comprising the Awareness subscale. The obtained results remained unchanged –detailed results are provided in the Supplementary material. Due to an excellent alpha value and successful use of the Polish version of the tool in previous studies (e.g., Gambin et al., 2023; Pankowski et al., 2023; Woźniak-Prus et al., 2023), we decided to use the questionnaire in its full, unchanged form for our main analysis reported in the current work.

Statistical Analysis

In the first step, we analyzed bivariate correlations between all analyzed variables and descriptive statistics. Next, we conducted mediation analyses, in which attachment avoidance and anxiety served as simultaneous predictors, ER difficulties as a mediating variable, and CSBD or PPU symptom severity as the dependent variable. We adjusted for sociodemographic characteristics and the frequency of various sexual behaviors. We created three models depending on the measure used to assess CSBD: BPS, CSBD-19 and CSBD-DI.

For mediation models, effects were evaluated using bootstrapping with 5000 iterations. We tested the strength of the analyzed effects with 95% biased-corrected bootstrapped confidence intervals.

We used the Statistical Package for the Social Sciences (SPSS, IBM Corp., v.27, 2020) to perform correlation analyses. For mediation analyses, we used the Amos software (Arbuckle, 2011).

As we predicted that the two attachment insecurity dimensions may be associated with different kinds of sexual behaviors, we created linear regression models in which attachment avoidance and attachment anxiety served as independent variables and the frequency of pornography use, masturbation, and sexual intercourse were treated as dependent variables. We also adjusted for difficulties with ER, gender, age, sexual orientation, and relationship status. We also conducted moderation analyses in which ER difficulties served as a moderator of the relationships between attachment anxiety/avoidance and CSBD/PPU symptom severity. We reported the results of analyses conducted for the DERS-SF general score. Additionally, we also conducted the calculations for the model without the Awareness subscale, due to the reliability problems related to the scale reported by other researchers, which was discussed in the main text of the manuscript (e.g., Fowler et al., 2014; Gouveia et al., 2022; Moreira et al., 2022). However, for all conducted models, the results of the moderation did not reach statistical significance. In other words, ER difficulties did not significantly moderate the relationship between attachment dimensions and CSBD and/or PPU symptom severity. For moderation analyses, we used SPSS (SPSS, IBM Corp., v.27, 2020). Due to issues with McDonald's omega for the DERS-SF's (Kaufman et al., 2016) and negative correlations of the Awareness subscale with other subscales, we also conducted mediation analyses excluding this subscale, which did not result in notable changes to the obtained results. As these analyses are not the focus of the current manuscript, we included these models in the Supplementary material.

Results

Descriptive Statistics and Correlation Coefficients

Descriptive statistics (means, SDs, and ranges), and correlation indices (Pearson's *r*) between the variables included in the analysis are presented in Table 1.

Mediation Analyses

Next, we performed an analysis to test whether emotion regulation difficulties (ER difficulties) mediate the relationship between insecure attachment dimensions (anxiety and avoidance) and CSBD or PPU symptom severity (for a conceptual diagram, see Fig. 2). We adjusted for the effect of gender, age, sexual orientation, relationship status (we controlled for their effect on ER difficulties, and CSBD symptom severity), and the effects of frequency of sexual behavior (pornography use, masturbation, and sexual intercourse) on CSBD and PPU. To

Table 1 Descriptive statistics and correlation indices (Pearson's *r*) estimating the strengths of relationships between variables

	M (*SD*)	Range	1	2	3	4	5	6	7	8	9	10
1. Age (in years)	50.49 (13.32)	20.00–72.00	–									
2. Frequency of pornography use	2.88 (2.34)	.00–8.00	−.20**	–								
3. Frequency of masturbation	2.94 (2.42)	.00–8.00	−.25**	.72**	–							
4. Frequency of sexual intercourse	4.16 (2.43)	.00–8.00	−.18**	.10**	.05	–						
5. CSBD severity (CSBD-19 General Score)	32.86 (10.12)	19.00–76.00	−.06	.34**	.27**	.10**	–					
6. CSBD severity (CSBD-DI General Score)	.35 (.97)	.00–7.00	−.15**	.27**	.27**	.04	34**	–				
7. PPU severity (BPS General Score)	1.63 (2.37)	.00–10.00	−.09**	.51**	.40**	−.03	.52**	43**	–			
8. Attachment avoidance	2.88 (1.04)	1.00–6.63	−.09**	.07*	.08*	−.27**	.17**	.11**	.14**	–		
9. Attachment anxiety	3.39 (1.37)	1.00–7.00	−.15**	.12**	.15**	−.19**	.27**	.20**	.28**	.29**	–	
10. ER difficulties (DERS General Score)	2.03 (0.56)	1.00–4.33	−.22**	.10**	.11**	−.14**	.35**	.20**	.31**	.28**	.46**	–

*$p < .05$ **$p < .001$

ER—emotion regulation; CSBD—compulsive sexual behavior disorder; PPU—problematic pornography use; CSBD-19—Compulsive Sexual Behavior Disorder Scale; CSBD-DI—Compulsive Sexual Behavior Disorder-Diagnostic Inventory; DERS—Difficulties in Emotion Regulation Scale

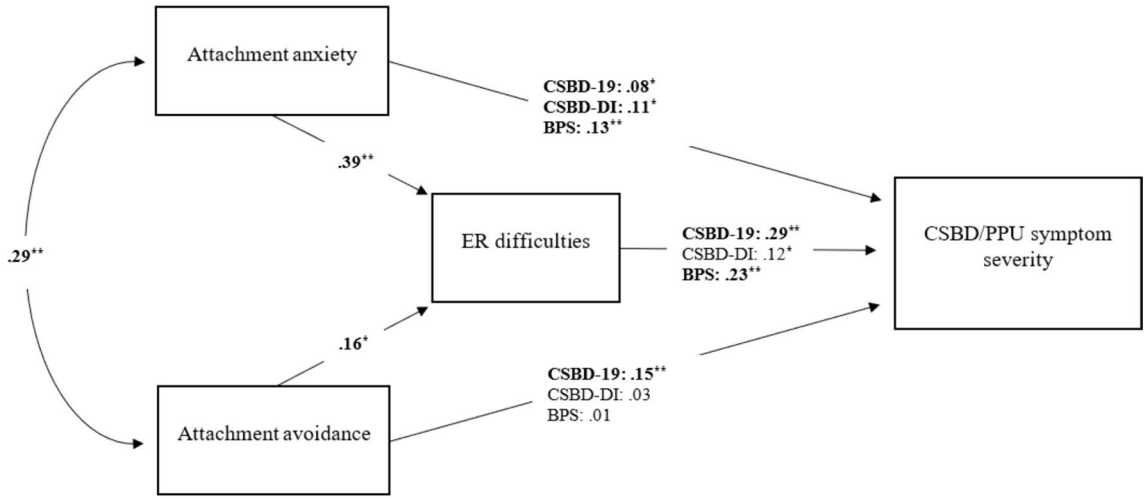

Fig. 2 Mediation model of relationships between attachment anxiety, attachment avoidance, and compulsive sexual behavior disorder or problematic pornography use with standardized coefficients. *$p < .05$ **$p < .001$. Note ER—emotion regulation; CSBD—compulsive sexual behavior disorder; PPU—problematic pornography use

assess the effect size of the indirect effect we used Cohen's measure (1988) as a reference standard, which may be used to assess the amount of mediation (Shrout & Bolger, 2002), however, we squared the values as an indirect effect is the product of two effects (from 0.01 to 0.09—small effect size, from 0.09 to 0.25—moderate, more than 0.25—large effect size) (Kenny, 2021).

We created two separate mediation models for CSBD severity depending on the measure used to assess the level of the dependent variable CSBD-19 (Bőthe et al., 2020a) or CSBD-DI (Grubbs et al., 2023).

For all three models, attachment avoidance and attachment anxiety showed a moderate positive correlation (r = .29, $p < .001$, 95%CI_{bc}[.22, .36]). Moreover, both attachment anxiety ($\beta = .39$, $p < .001$, 95%CI_{bc}[.33, .45]) and attachment avoidance ($\beta = .16$, $p < .05$, 95%CI_{bc}[.09, .21]) predicted greater ER difficulties.

Compulsive Sexual Behavior Disorder

CSBD-19. In the model presented in Table 2, we placed CSBD symptom severity measured by CSBD-19 (Bőthe et al., 2020a) in the role of the dependent variable. The model showed a satisfactory fit to the data ($\chi^2(3) = 6.93$, $p = .074$; RMSEA = .036; SRMR = .007; and CFI = .999).When placed in the role of simultaneous predictors both attachment anxiety ($\beta = .15$, $p < .001$, 95%CI_{bc}[.08, .22]) and avoidance ($\beta = .08$, $p < .05$, 95%CI_{bc}[.02, .14]) significantly predicted

Table 2 Statistical mediation model of relationships between attachment anxiety, attachment avoidance, and compulsive sexual behavior disorder symptoms (measured by the Compulsive Sexual Behavior Disorder Scale [CSBD-19])

Independent variable	Type of effect	Effect path	β	95% C.I		p	Interpretation
				Lower	Upper		
Attachment anxiety	Indirect	Attachment anxiety → ER difficulties → CSBD	.12	.09	.15	< .001	Moderate partial mediation
	Direct	Attachment anxiety → CSBD	.15	.08	.22	< .001	
	Total	Attachment anxiety → CSBD	.27	.21	.33	< .001	
Attachment avoidance	Indirect	Attachment avoidance → ER difficulties → CSBD	.05	.03	.07	< .001	Weak partial mediation
	Direct	Attachment avoidance → CSBD	.08	.02	.14	.011	
	Total	Attachment avoidance → CSBD	.12	.06	.18	< .001	

Emotion regulation difficulties were included in the models in the mediator role

Entries are standardized coefficients. Models controlled for the effects of gender, age, relationship status, sexual orientation, and frequency of pornography watching, masturbation, and sexual intercourse

ER—emotion regulation; CSBD—compulsive sexual behavior disorder symptom severity

Table 3 Statistical mediation model of relationships between attachment anxiety, attachment avoidance, and compulsive sexual behavior disorder symptoms (measured by the Compulsive Sexual Behavior Disorder-Diagnostic Inventory [CSBD-DI])

Independent variable	Type of effect	Effect path	β	95% C.I		p	Interpretation
				Lower	Upper		
Attachment anxiety	Indirect	Attachment anxiety → ER difficulties → CSBD	.05	.02	.08	.002	Weak partial mediation
	Direct	Attachment anxiety → CSBD	.11	.03	.18	.004	
	Total	Attachment anxiety → CSBD	.15	.07	.22	.001	
Attachment avoidance	Indirect	Attachment avoidance → ER difficulties → CSBD	.02	.01	.04	.001	Weak full mediation
	Direct	Attachment avoidance → CSBD	.03	− .05	.14	.427	
	Total	Attachment avoidance → CSBD	.05	− .03	.15	.224	

Emotion regulation difficulties were included in the models in the mediator role

Entries are standardized coefficients. Models controlled for the effects of gender, age, relationship status, sexual orientation, and frequency of pornography watching, masturbation, and sexual intercourse

ER—emotion regulation; CSBD—compulsive sexual behavior disorder symptom severity

CSBD symptom severity. Moreover, both these effects were partially mediated by emotion regulation difficulties; the indirect effects on CSBD: (1) attachment anxiety: $\beta = .12$, $p < .001$, 95%CI_{bc}[.09, .15], moderate partial mediation; (2) attachment avoidance $\beta = .05$, $p < .001$ 95%CI_{bc}[.03, .07], small partial mediation. Emotion regulation difficulties also had a direct positive effect on CSBD symptom severity ($\beta = .29$, $p < .001$, 95%CI_{bc}[.23, .36]).

We also found a few significant effects of variables we adjusted for in the analysis. Men were more likely to have lower ER difficulties ($\beta = -.06$, $p < .05$, 95%CI_{bc}[−.11, −.01], as well as higher CSBD symptom severity ($\beta = .16$, $p < .05$, 95%CI_{bc}[.09, .22]). Moreover, a higher age was associated with lower ER difficulties ($\beta = -.15$, $p < .001$, 95%CI_{bc}[−.21, −.09]), but with higher CSBD symptom severity ($\beta = .10$, $p < .05$, 95%CI_{bc}[.04, .16]). Both being in a formal ($\beta = .13$, $p < .05$, 95%CI_{bc}[.05, .21]) and informal relationship ($\beta = .10$, $p < .05$, 95%CI_{bc}[.02, .18]) was predictive of higher CSBD symptom severity. Additionally, being sexually diverse was associated with higher CSBD symptoms ($\beta = -.08$, $p < .05$, 95%CI_{bc}[−.14, −.02]. A higher frequency of porn watching ($\beta = .17$, $p < .001$, 95%CI_{bc}[.09, .26]) and sexual intercourse ($\beta = .12$, $p < .05$, 95%CI_{bc}[.05, .18]) was a risk factor for higher CSBD symptom severity.

CSBD-DI. In the model presented in Table 3, CSBD symptom severity measured by the CSBD-DI (Grubbs et al., 2023) was the dependent variable. The model showed a satisfactory fit to the data ($\chi^2(3) = 6.93$, $p = .074$; RMSEA = .036; SRMR = .007; and CFI = .999). When placed in the role of simultaneous predictors, attachment anxiety ($\beta = .11$, $p < .05$, 95%CI_{bc}[.03, .18]), but not avoidance ($\beta = .03$, $p = .427$, 95%CI_{bc}[−.05, .14]) significantly predicted CSBD symptom severity. Moreover, the effect of attachment anxiety on CSBD symptom severity was partially mediated by emotion

Table 4 Statistical mediation model of relationships between attachment anxiety, attachment avoidance, and problematic pornography use symptoms

Independent variable	Type of effect	Effect path	β	95% C.I		p	Interpretation
				Lower	Upper		
Attachment anxiety	Indirect	Attachment anxiety → ER difficulties → PPU	.09	.06	.12	< .001	Moderate partial mediation
	Direct	Attachment anxiety → PPU	.13	.08	.19	< .001	
	Total	Attachment anxiety → PPU	.22	.17	.28	< .001	
Attachment avoidance	Indirect	Attachment avoidance → ER difficulties → PPU	.04	.02	.06	< .001	Weak full mediation
	Direct	Attachment avoidance → PPU	.01	− .04	.06	.805	
	Total	Attachment avoidance → PPU	.04	− .01	.09	.118	

Emotion regulation difficulties were included in the models in the mediator role. Entries are standardized coefficients

Entries are standardized coefficients. Models controlled for the effects of gender, age, relationship status, sexual orientation, and frequency of pornography watching, masturbation, and sexual intercourse

ER—emotion regulation; PPU—problematic pornography use symptom severity

regulation difficulties ($\beta = .05$, $p < .05$, 95%CI_{bc}[.02, .08], small partial mediation). The effect of attachment avoidance on CSBD symptom severity was fully mediated by ER difficulties (indirect effect: $\beta = .02$, $p < .05$, 95%CI_{bc}[.01, .04], small effect size). Difficulties with ER had direct positive effect on CSBD symptoms ($\beta = .12$, $p < .05$, 95%CI_{bc}[.04, .19]).

We also found a few significant effects of variables we adjusted for in the analysis. Male gender was predictive of lower ER difficulties ($\beta = -.06$, $p < .05$, 95%CI_{bc}[−.11, −.01]. Moreover, higher age was associated with lower ER difficulties ($\beta = -.15$, $p < .001$, 95%CI_{bc}[−.21, −.09]). A higher frequency of porn watching ($\beta = .12$, $p < .05$, 95%CI_{bc}[.03, .22]) and masturbation ($\beta = .13$, $p < .05$, 95%CI_{bc}[.04, .20]) was a risk factor for higher CSBD symptom severity.

Problematic Pornography Use

We created a model with the same predictors, but with PPU symptom severity (measured by the BPS; Kraus et al., 2020) serving as the dependent variable (Table 4). The model showed a satisfactory fit to the data ($\chi^2(3) = 6.93$, $p = .074$; RMSEA = .036; SRMR = .007; and CFI = .999). When placed in the role of simultaneous predictors, only attachment anxiety ($\beta = .13$, $p < .001$, 95%CI_{bc}[.08, .19]), but not avoidance ($\beta = .01$, $p = .805$, 95%CI_{bc}[−.04, 0.06]) significantly predicted PPU symptom severity. Moreover, the effect of attachment anxiety was partially mediated by emotion regulation difficulties (the indirect effect on PPU for attachment anxiety: $\beta = .09$, $p < .001$, 95%CI_{bc}[.06, .12], moderate effect size). The influence of attachment avoidance on PPU symptom severity was fully mediated by ER difficulties $\beta = .04$, $p < .001$, 95%CI_{bc}[.02, .06], with a small effect size. Emotion regulation difficulties showed a direct positive effect on PPU symptom severity ($\beta = .23$, $p < .001$, 95%CI_{bc}[.17, .29]).

Moreover, male gender was predictive of milder ER difficulties ($\beta = -.06$, $p < .05$, 95%CI_{bc}[−11, −.01]) and higher PPU symptom severity ($\beta = .11$, $p < .05$, 95%CI_{bc}[.05, .17]). Additionally, higher age was associated with fewer ER difficulties ($\beta = -.15$, $p < .001$, 95%CI_{bc}[−.21, −.09]). Regarding sexual activity, only the frequency of pornography use predicted more severe PPU symptoms ($\beta = .40$, $p < .001$, 95%CI_{bc}[.32, .49]).

Discussion

To the best of our knowledge, our study was the first to investigate the associations between attachment insecurity dimensions and CSBD and PPU, employing difficulties with ER as the explanatory mechanism. Our results are in line with previous studies showing the importance of attachment insecurity (see Efrati et al., 2022) and ER difficulties in CSBD (e.g., Engel et al., 2019; Hashemi et al., 2018; Pachankis et al., 2014). Moreover, they corroborate the theoretical claim that ER difficulties may be a useful framework for explaining the impact of attachment insecurity on CSBD (see Lew-Starowicz et al., 2020).

Attachment Insecurity and Compulsive Sexual Behavior Disorder

The results regarding the direct effects of attachment insecurity dimensions on CSBs are mixed (H1 and H3 were supported, H2 was partially corroborated, H4 was not supported). However, the indirect effect (mediated by ER difficulties) of attachment insecurity dimensions on CSBs was significant for all tested paths. It means that the effect of attachment avoidance on PPU was fully encapsulated by the mediator variable—difficulties with ER.

Our results clearly show the associations between attachment insecurity and CSBs, in line with previous research (e.g., Ciocca et al., 2021; Gilliland et al., 2015), presumably showing the greater importance of attachment anxiety in explaining CSBD and PPU symptom severity. Prior research regarding the role of specific attachment insecurity dimensions in CSBD has shown inconsistent results. Some studies show that the differences in CSBD symptom severity are better explained by attachment anxiety (Beutel et al., 2017; Giordano et al., 2017; Kircaburun et al., 2023). However, other studies point to attachment avoidance being a stronger predictor of CSBD than attachment anxiety (Crocker, 2015; Varfi et al., 2019).

The inconsistency regarding the relative importance of specific attachment insecurity dimensions across different research may partly stem from a lack of controlling for the specific types of assessed CSBD. Different attachment insecurity dimensions are reflected in specific difficulties in bonding with others that could presumably be associated with, for example, engagement in different kinds of online and offline sexual activities (Varfi et al., 2019). For instance, adolescents who engaged only in online sexual behavior displayed greater attachment avoidance than those who engaged in both online and offline sexual activities (Efrati & Amichai-Hamburger, 2021). Presumably, individuals characterized by high attachment avoidance may at least in some circumstances prefer activities that do not require direct interactions with others (to prevent bonding with others) and would more often get involved in solitary sexual activities in a virtual space. On the other hand, high attachment anxiety could be associated with more frequent dyadic activities requiring direct contact with sexual partners. This hypothesis, however, does not seem to be fully supported by the additional analyses that we conducted (see Table S1 in Supplementary material). Similarly, attachment avoidance and anxiety predicted less frequent dyadic sexual activity which may be explained by different motifs; attachment avoidance was associated with undertaking dyadic sexual activity in order to fulfill sexual needs, while attachment anxiety was related to striving for the fulfilment of emotional needs (Saint-Eloi Cadely et al., 2020).

Emotion Regulation and Compulsive Sexual Behavior Disorder

Our results show the direct positive effect of ER difficulties on CSBD and PPU symptom severity (corroborating hypotheses H5 and H6), which is in line with previous empirical studies (Hashemi et al., 2018; Pachankis et al., 2014). It is important to highlight, however, that the above-cited, as well as many other previous studies (e.g., Engel et al., 2019; Reid et al., 2008, 2011), conceptualized CSBD as a hypersexual disorder [HD; proposed for but ultimately not included in the DSM-5 (Kafka, 2010)]. One of the diagnostic criteria for HD was engagement in sexual behaviors in order to cope with dysphoric mood states. The current conceptualization of CSBD, as well as the instruments we used for its assessment, are based on the ICD-11 criteria (WHO, 2022a) that do not include this criterion. Such a difference in conceptualizations may affect the strength of the relationship between ER difficulties and symptom severities. Nonetheless, to the best of our knowledge, our study is the first to use this conceptualization to show the associations between CSBD and ER difficulties. Assessment of PPU differs in this regard as well, for example, the BPS (Kraus et al., 2020) (that we used to assess PPU) has an item that reflects pornography use as a maladaptive coping strategy. This may result in stronger associations between PPU symptom severity and ER difficulties. The relationship between PPU symptom severity and ER difficulties is, however, also supported by studies that use measures that do not reflect this aspect of PPU (Baranowski et al., 2019; Laier & Brand, 2017).

Emotion Regulation as a Mechanism Explaining the Relationship Between Attachment Insecurity and Compulsive Sexual Behavior Disorder

Our results show that ER difficulties may act as a mechanism explaining the relationship between attachment insecurity and CSBD and PPU. In our study, the relationships between both attachment anxiety and avoidance on one side, and CSBD or PPU on the other, were all mediated by difficulties with ER (these results lend support to H7-H10). Moreover, in the case of the associations between attachment avoidance and PPU symptom severity, and between attachment avoidance and CSBD (as measured by CSBD-DI, but not CSBD-19), they were completely mediated by ER. This means that the effect of attachment avoidance on PPU and CSBD severity (when assessed by CSBD-DI) is fully encapsulated by difficulties with ER. The difference in those results may stem from the different construction of the two measures; we elaborate on this topic in the next section (Assessment of CSBD/PPU symptom severity with CSBD-19 vs. CSBD-DI).

One of the possible interpretative routes for the results of our mediation analyses underlines that attachment avoidance is associated with deactivating ER strategies. Attachment avoidance is characterized by fear of intimacy, interdependence, and emotional openness (Crowell et al., 2008). In order to avoid those aspects of bonding to others, the individual undertakes efforts to inhibit their emotions so their attachment system is deactivated. In that way, compulsive sexual behaviors can potentially act as a substitute for intimate relationships and lack of intimacy (Leedes, 1999a, 2001).

Anxiously attached individuals, however, have been taught to intensify their negative emotions to attract the attention of attachment figures. They are characterized by fear of insufficient

love or abandonment and may engage in sexual activity to alleviate distress resulting from those beliefs (Crowell et al., 2008). Engagement in compulsive sexual behaviors, however, may further intensify those feelings, for example, lack of emotional engagement of a casual sexual partner may be interpreted by a highly anxious individual as abandonment and this may further intensify the fear of abandonment in future interactions.

These mechanisms may probably determine engagement in different types of sexual behaviors depending on which insecure attachment dimension is more prominent for an individual. The models in which we checked how the specific attachment insecurity dimensions predict the frequency of different sexual behaviors provide some explanation for those results (see Supplementary Material). Attachment avoidance, as well as attachment anxiety, predicted lower sexual intercourse frequency. On the other hand, only attachment anxiety predicted a higher frequency of solitary sexual behaviors, while attachment avoidance showed no association with them. The correlation indices for the relationships with the frequency of pornography use and masturbation for both dimensions are, however, all negative and significant. Attachment avoidance, compared to attachment anxiety, may therefore indicate generally lower engagement in sexual behaviors. These results are, however, preliminary and limited, thus this hypothesis should be disentangled in future studies.

Detailed assessment of specific sexual activities and motives for their undertaking, as well different aspects of insecure attachment, is needed in future studies to disentangle these complex associations. For example, sexual activity may be seen as a means of fulfilling sexual needs and may be associated with pleasure maximization, as well as having a higher number of sexual partners for highly avoidant individuals (Szielasko et al., 2013). On the other hand, for individuals high in attachment anxiety engagement in sexual activities in order to satisfy their emotional needs may be more prominent (Saint-Eloi Cadely et al., 2020). This claim seems consistent with consideration of CSBD in terms of an attachment disorder (Flores, 2004; Gilliland et al., 2015; Riemersma & Sytsma, 2013; Zapf et al., 2008).

To sum up, to the best of our knowledge, our study is the first to show that ER difficulties may mediate the relationship between attachment insecurity and, CSBD and PPU.

Assessment of Compulsive Sexual Behavior Disorder and Problematic Pornography Use Symptom Severity with Compulsive Sexual Behavior Disorder-19 vs. Compulsive Sexual Behavior Disorder-Diagnostic Inventory

It is important to note the possible explanation for the difference between the results of mediation analyses regarding CSBD depends on the measures used. Both measures of CSBD that we used are based on the current CSBD's ICD-11 criteria. However, the design of both measures is significantly different, with CSBD-DI using statements with a higher degree of complexity and different approach to the response scale and response grading. A descriptive analysis (Table 1) shows that, perhaps due to this complexity, research participants seemed to be more conservative in assessing their CSBD symptoms using CSBD-DI than CSBD-19 (mean response for CSBD-DI: $M = .35$, $SD = .97$, possible range between 0 and 7 points; mean response for CSBD-19: $M = 32.86$, $SD = 10.12$, possible range between 19 and 76 points). Associations between CSBD-DI on one side and attachment and emotion regulation variables on the other side may have been slightly diminished due to floor effects for CSBD-DI, which were not present for CSBD-19. However, the obtained inconsistency needs to be further explored in future studies to confirm whether the measures can be used interchangeably in general population research and what the possible differences between them are. Importantly, our study did not involve a clinical sample and our conclusions do not extend to CSBD-DI and CSBD-19 performance in clinical research, which should also be addressed in future studies. Due to concerns about overestimation of CSBD/PPU occurrence (Lewczuk et al., 2023b; Lew-Starowicz & Coleman, 2022), a conservative approach may even be preferable in aiding CSBD diagnosis, however, future research including clinical samples should further investigate this subject.

Additional Variables

In our study, the male gender was associated with fewer ER difficulties, however, the effect size of the relationship was small. This result is inconsistent with previous research showing no gender differences (Giromini et al., 2017; Sörman et al., 2022; Westerlund & Santtila, 2018) in difficulties with ER. Further, higher age was associated with fewer ER difficulties in line with previous studies (Giromini et al., 2017; Westerlund & Santtila, 2018).

Contrary to the existing evidence (e.g., Grubbs et al., 2019; Lewczuk et al., 2023b, 2023c) age showed no significant relationship to PPU or CSBD (as measured by the CSBD-DI, and a negative relationship when assessed with the CSBD-19). This can be explained by the unrepresentativeness of the current sample in terms of sociodemographic characteristics and participants' lower mean age compared to the previously cited studies. Male gender, similar to the results of previous studies (e.g., Bőthe et al., 2020a, 2020b; Kraus et al., 2020), was linked to higher severity of PPU and CSBD, however, the underrepresentation of female samples in research should be noted (see e.g., Kowalewska et al., 2020, 2022). Being in a romantic relationship was associated with higher CSBD symptoms severity (but only when measured with CSBD-19). The results regarding the impact of relationship status on CSBD and PPU are inconsistent (no significant relationship, e.g., Lewczuk et al., 2023c; positive predictor, e.g., Wizła et al., 2022). The pattern of bonding to others that the

attachment insecurity describes may play a more prominent role in CSBD and PPU symptom severity rather than the relationship status itself. Thus, the effect of attachment insecurity may have encapsulated the relationship status' effect on CSBD and PPU. Non-heterosexual orientation was associated with higher CSBD symptom severity, which is consistent with previous research (Dickenson et al., 2018; see also Black, 2000; Bőthe et al., 2018; Kelly et al., 2009; Parsons et al., 2013, 2015). This result can be linked to the minority stress experienced by sexually diverse individuals that is associated with CSBD and PPU symptoms (Lewczuk et al., 2023a). The results of our study regarding the relationships between the frequency of specific sexual activities and CSBD/PPU symptoms are inconsistent, lending support to the claim that a high frequency of sexual behaviors cannot be unequivocally associated with CSBD (e.g., Bőthe et al., 2020a, 2020b; Carvalho et al., 2015).

Limitations and Future Directions

A few limitations to our study should be noted. The study's cross-sectional design does not allow for causal inference; hence the conclusions should be treated with caution. Future longitudinal studies should help disentangle and confirm the causal character of the relationships obtained in our study. Research would also benefit from an experimental design that would encompass psychotherapeutic interventions aimed at modifying ER strategies or attachment styles and how changing those aspects may affect CSBD and PPU symptom severity. Future studies could also concentrate on specific maladaptive ER strategies, and not general ER difficulties. Our conclusions are limited to a convenience sample from the Polish adult population. Future studies should check if the results replicate in representative samples, different cultural contexts, and more vulnerable groups such as sexual minorities and adolescents. Research regarding attachment insecurity's role in CSBD would also benefit from distinguishing between different kinds of online and offline sexual activities as they may be driven by specific mechanisms (Efrati & Amichai-Hamburger, 2021). Another issue to consider is the context of the Covid-19 pandemic that might have affected the results of the present study, as the impact of this context on CSBD/PPU symptoms is inconsistent (Bőthe et al., 2022; Grubbs et al., 2022; Koós et al., 2022; Xiong et al., 2020; Zattoni et al., 2020). Therefore, future studies should aim to replicate our results when the epidemic situation is different.

Implications

Our study has both theoretical and practical implications. The importance of ER difficulties in CSBD/PPU development and maintenance should be confirmed in future longitudinal studies; such evidence would imply that effective ER should be targeted in therapeutic interventions for CSBD (Gratz et al., 2015) and that individuals experiencing CSBD may benefit from therapeutic approaches focused on ER regulation, for example, from dialectical behavior therapy (see Harvey et al., 2019). Another, "third wave" cognitive behavioral therapy approach that may be beneficial for targeting emotion dysregulation in CSBD/PPU is Acceptance Commitment Therapy which emphasizes the role of experiential avoidance [attempts to avoid and escape one's internal experiences, among others, emotions (Hayes et al., 1996)] in the development and maintenance of psychiatric problems [among them CSBD (Borgogna & McDermott, 2018; Brem et al., 2017; Levin et al., 2019; Wetterneck et al., 2012)]. Generally, mindfulness-based approaches are associated with strategies aimed at handling emotions and those treatments have been found to be effective in decreasing ER difficulties (see Roemer et al., 2015). Another issue to highlight is the importance of therapeutic alliance and the possibility of modifying attachment styles in psychotherapy (e.g., Gidhagen et al., 2018; Kinley & Reyno, 2013; Spence et al., 2016; Travis et al., 2001; see Levy et al., 2018; Slade & Holmes, 2019).

Conclusions

Our study is the first to show the mediating role of ER difficulties in the relationship between attachment insecurity and CSBD as well as PPU symptom severity. Overall, difficulties with ER partially mediated the effect of attachment anxiety and fully mediated the effect of attachment avoidance on CSBD and PPU. Emotion regulation difficulties can be employed as an explanatory mechanism for the associations between attachment insecurity and CSBD and PPU. Insecurely attached individuals develop maladaptive ER strategies in interactions with primary caregivers, which in turn can contribute to developing CSBD and PPU symptoms in the future. Future studies should expand on our results by investigating attachment, ER and CSBD/PPU relationships in different cultural contexts and using different methodological approaches. Moreover, therapeutic interventions targeting ER difficulties and attachment insecurity should be investigated as a promising aid for CSBD and PPU.

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Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Conflict of interest The authors declare no conflict of interest.

Ethical Approval The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the Cardinal Stefan Wyszyński University in Warsaw approved the study.

Informed Consent All participants were informed about the study and provided informed consent.

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Compulsive Sexual Behavior Disorder and Problematic Pornography Use in the Context of Social Ties

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Abstract

Purpose of Review The objective of this review was to (1) outline the current empirical evidence on the impact of social factors on the development and maintenance of CSBs (compulsive sexual behaviors), (2) identify research gaps in this field, and (3) suggest potential future avenues for studying CSBs within a social framework.

Recent Findings The evidence highlights insecure attachment as a risk factor for the development of CSBs, indicating a potentially more significant role of attachment anxiety. Higher perceived social support was associated with lower CSB severity; however, the small effect size suggests a supportive role. Loneliness may serve as a risk factor for CSBs across populations. Minority stressors were positively related to CSB severity, while therapy addressing those stressors effectively diminished CSB symptoms. Empirical findings imply complex bidirectional influences between the social bonds' quality and CSBD/PPU (compulsive sexual behavior disorder/problematic pornography use). Moreover, interpersonal aspects and mutual support are crucial elements in individual, couple, and group treatment for CSBs.

Summary Empirical evidence highlights the significance of social factors like loneliness, perceived social support, attachment anxiety, avoidance, and romantic bond quality in CSBD/PPU. Social factors should be considered in clinical practice as they may be involved in the development and maintenance of CSBs. Addressing them in therapy may facilitate the treatment process. However, methodological differences across studies make drawing definitive conclusions impossible. More longitudinal data from multicentered projects using standardized methodologies to clarify causality of the relationships are needed.

Keywords Compulsive sexual behavior disorder · Problematic pornography use · Social factors · Relationship quality · Insecure attachment · Review

Introduction

Compulsive sexual behavior disorder (CSBD) is recognized in the International Classification of Diseases, 11th edition (ICD-11) [1] as an impulse control disorder. CSBD is characterized by excessive thoughts, urges, and behaviors in the sexual domain to the point it becomes a central focus of the individual's life. A person experiencing those symptoms engages in sexual behaviors at the expense of other areas of life, despite negative consequences and deriving little or no sexual satisfaction from sexual activity. Moreover, they have undertaken unsuccessful attempts to control their sexual behaviors better. The most prevalent behavioral pattern of CSBD is problematic pornography use (PPU) (up to 80% of all cases [2]). PPU is characterized by an uncontrolled and excessive pattern of pornography consumption and its frequent use as a maladaptive strategy to cope with dysphoric mood states [3]. Whether PPU is a subtype of CSBD (i.e., CSBD may be used as an umbrella term for different behavioral presentations of problematic sexual activities) or a unique condition that should be considered in isolation from CSBD is still under debate, see [4].

Before its current conceptualization, different models had been proposed to explain the etiology of CSBD. An impaired ability to form relationships was proposed to be at the core of the disorder. For example, CSBD may be described as an attachment disorder (e.g., [5–7]) or intimacy disorder [8–10]. According to those conceptualizations, an individual may develop obsessive fantasizing or engage in compulsive sexual behaviors (CSBs) as a substitute for close interpersonal relationships.

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It was proposed that an impaired ability to form satisfying relationships might indeed have been at the core of the disorder in the past. However, with time, other factors such as the increasing accessibility of online pornography due to the dissemination of modern technologies became a more salient factor, while the role of social ties was moved to the background [11]. Recent research still points to the significant supporting role of social factors in CSBs. However, their exact associations with CSBs—their role in development mechanisms, assessment, and treatment—do not seem to be well-established. Therefore, the aim of the present narrative review is to (1) present the current state of the art regarding the empirical evidence for the involvement of social factors in the development and maintenance of CSBD and PPU, (2) identify research gaps in this field, and (3) propose possible future directions of the study of CSBs in a social context.

Literature Review

Our literature search involved scanning the following databases: Google Scholar, PubMed, and EBSCO. The search terms involved different combinations of terms associated with compulsive sexual behavior (i.e., compulsive sexual behavior disorder, compulsive sexual behavior, problematic pornography use, hypersexuality, hypersexual disorder, sex addiction) and different social factors (attachment insecurity/avoidance/anxiety, perceived social support, social connectedness, relationship quality, loneliness, social bonds, minority stress). The articles were chosen based on titles and abstracts, as well as the scanning references in the relevant manuscripts.

After the literature review, the main studied variables and factors were identified and described in the following review in the subsequent sections pertaining to (1) attachment styles, (2) perceived social support and (3) social connectedness, (4) loneliness, (5) parent–child relationships, (6) intimate relationship quality and satisfaction, and (7) minority stressors. Next, the role of social factors in (8) group and (9) individual treatment for CSBs based on the available evidence was discussed. Lastly, (10) conclusions, limitations of available studies, and recommendations for future research inferred from the literature review were outlined.

Attachment

A concept that can be used to explain the role of social ties in the development of different disorders is attachment. Attachment style describes the set of cognitive beliefs, emotions, and behaviors associated with regulating proximity to others [12]. Insecure attachment can be described by two dimensions, anxiety and avoidance, which determine different maladaptive characteristics of bonding to others. Attachment anxiety is associated with fear of insufficient love and abandonment, while avoidance with the fear of closeness and intimacy.

CSBs have been proposed to be conceptualized as an attachment disorder [5–7]. CSBs can serve to both trigger and suppress attachment behaviors, which can be indicative of disorganized attachment [10].

A wide body of empirical evidence exists linking attachment insecurity to higher CSBD/PPU symptom severity, see [13]. While plenty of studies indicate a greater role of anxiety [14–16], several propose that attachment avoidance is a more salient factor for CSBD [17]. This makes it difficult to draw firm conclusions about the greater involvement of one of the dimensions. In convenience samples of adolescents [14, 18, 19] and adults [20], attachment anxiety was associated with a higher frequency of CSBs. CSB severity was moderated by attachment anxiety, showing greater symptom severity with higher attachment anxiety [21]. CSBD has been linked to both attachment anxiety and avoidance for both heterosexual and sexually diverse men and women [22–25]. Also, being a male diagnosed with ADHD and characterized by high attachment anxiety was predictive of PPU [26].

In a population of treatment seekers for CSBD/PPU, fearful and preoccupied attachment styles (which are insecure styles) were more often reported [5]. In a clinical population experiencing CSBs, almost all participants reported insecure attachment styles [8] or more attachment avoidance and anxiety [7]. The relationship between attachment styles and CSBs seems to be more pronounced in women compared to men [27].

The link between attachment insecurity and CSBD/PPU symptom severity has been hypothesized to be explained by emotion regulation (ER) difficulties [28••]. This association is often highlighted by therapists working with CSBD clients; an insecure attachment style was reported to prevent clients from forming supportive bonds with others, which in turn inhibited effective emotion regulation [29]. The empirical evidence for the legitimacy of this theoretical claim has been shown in recent research in which ER difficulties mediated the link between both attachment anxiety and avoidance as well as CSB symptoms [25]. However, another perspective emphasized by practitioners, which should be taken into consideration before inferring the causal influence, is that attachment insecurity may not always be the cause of CSBs, but rather addiction can lead to disruption in attachment [29].

The existing evidence points to the fact that insecure attachment may be a risk factor for the development of CSBs, probably indicating a more pronounced role of attachment anxiety [15, 30]. However, more longitudinal research,

as well as investigation of therapies aimed at modification of attachment styles, is needed to confirm the causality of those relationships.

Perceived Social Support

Another branch of research showing the importance of social ties in CSBD and PPU, which is closely associated with attachment, regards the role of perceived social support. Perceived social support may be described as "the individual's beliefs about the availability of varied types of support from network associates" ([31], p. 512]). By definition, attachment encompasses the expectations of oneself and others when creating bonds with them and therefore can include the assessment of available social resources that an individual can use as support. An insecure attachment style was associated with a negative interpretation of received support and a poorer quality of offered support [32]. Moreover, the relationship between social support and psychological distress becomes insignificant when insecure attachment is included in the analyses [33].

Empirical evidence from a convenience sample and sample representative of the Polish adult population showed significant negative associations of perceived social support with the severity of CSBD and PPU symptoms [34]. Additionally, in a group of men seeking treatment for CSB, perceived social support from friends was associated with less severe symptoms; however, this support did not significantly predict CSBs [35]. Surprisingly, support from family or significant others did not relate to the severity of symptoms which may be attributed to the problems in family and partner relationships reported by study participants [35]. In a group receiving treatment for love addiction, perceived social support showed no significant relationship with CSB symptom severity; however, the relationship was negative and significant in the control group. The effects were small in size in contrast to the study hypotheses [36].

The role of social support has been emphasized as one of the most important factors protecting against mental health problems in LGBT people [37, 38]. However, the empirical data from a group of cisgender sexually diverse individuals does not support this claim for CSBD or PPU. Perceived social support only negatively predicted CSBD, but not PPU symptoms [39]. This result, however, could be explained by the inclusion of minority stress measures (which could also reflect lower social support) in the statistical model as competing CSBD and PPU predictors (see the "Minority Stressors" section).

Lower social support was also hypothesized to be a mediating factor explaining the link between substance use and CSBs [40]. In line with this argument, impaired emotion regulation abilities could lead to maladaptive coping strategies such as substance use or CSBs. However, initial empirical evidence does not support this claim. Women with substance use disorder perceived available social support as lower and were characterized by higher CSBD symptom severity, but perceived social support did not mediate the relationship between the two classes of symptoms [40].

To sum up, the existing evidence shows that higher perceived social support is associated with lower CSB symptom severity, but its small effect size indicates a more supporting, secondary role. However, the possibility of reverse influence should also be taken into consideration as CSBD and PPU symptoms can influence the quality of relationships, e.g., [41]. Extensive research on the impact of pornography consumption on the quality of relationships has produced mixed and unclear findings, see [42, 43]. This should be disentangled in future longitudinal studies.

Social Connectedness

Another concept that describes the interpersonal closeness that an individual experiences is social connectedness [44]. Social connectedness describes an individual's ability to feel at ease and confident in a broad social setting and is also associated with comfort when fulfilling specific social roles [45]. It has been hypothesized that men who have sex with men (MSM) may tend to turn to online sex because of decreased social connectedness [46]. Indeed, empirical data showed that MSM who experienced decreased levels of social connectedness were at higher risk of developing online sexual addiction [47]. Also, sexual orientation was not associated with social connectedness or disclosure of sexual orientation (which is a measure of minority stress). This contradicts the claim that sexually diverse individuals may receive decreased levels of social connectedness, which in turn leads to higher levels of CSB symptoms [47]. Although significant relationships between social connectedness and CSBs have been found, this variable has rarely been studied in the context of sexual behavior, and future research should further explore its role in the development of CSBs.

Loneliness

A construct that is widely studied in the context of CSBs and social functioning and investigated as a risk factor across populations for CSBD/PPU is loneliness [48–52]. Loneliness is a term used to describe a state when an individual's real levels of social interaction are lower than desired ones [53].

Based on the current literature, a group emerging as especially vulnerable to loneliness' impact on CSBs is underaged individuals. Among adolescents aged 13–21 years [54], as well as university students [55], loneliness predicted CSBs. Moreover, loneliness, anxious attachment, and an external

attributional style were emphasized as the strongest predictors of CSBs among adolescents [19].

According to the Loneliness and Sexual Risk Model (LSRM) [52], CSBs are driven by coping mechanisms, that is, those behaviors are undertaken to deal with difficult emotions such as loneliness. Hence, reduction in loneliness should lead to a decrease in the severity of symptoms. Although emotion dysregulation is currently not a formal criterion of CSBD, it has been suggested to be its important characteristic and has been widely discussed [28••, 56]. Indeed, CSBs were proposed to be a response to anxiety induced by loneliness [57, 58]. Moreover, loneliness partially mediated the relationship between emotion regulation and PPU [59]. Generally, loneliness was connected to higher pornography consumption and a search for sexual encounters online, while a higher frequency of those behaviors indicated more probable addiction-like characteristics [60]. However, opposite data shows that more lonely participants were less likely to engage in sexual activities, which would imply that the driving force behind CSBs is not a lack of interpersonal connections, but rather that CSBs are used as a regulation strategy [61]. It should be noted, however, that the previously mentioned data did not distinguish between problematic and non-problematic sexual behaviors.

Evidence linking loneliness to CSBs, however, has not been found in some of the available studies. Problematic Internet users were characterized by a higher frequency of using the Internet for sexual purposes, and they participated in Sexual Compulsives Anonymous 12-step groups more often [62]. Interestingly, different levels of problematic Internet use were not found to be associated with feelings of loneliness. Again, as with other social factors, the possible opposite influence has also been discussed implying that greater pornography use may cause experiences of more severe loneliness [63].

Despite many studies exploring the relationships between loneliness and CSBD/PPU, the existing data is far from being conclusive. A recent meta-analysis showed that few longitudinal studies do not unanimously confirm the causal relationships between loneliness and PPU, while there are currently no longitudinal studies regarding CSBD [64••]. The existence of relationships is evident, but more studies are needed to disentangle the nature of those interconnections.

Parent–Child Relationships

Another branch of studies examining the role of social factors in CSBD/PPU development regards the protective influence of good relationships with parents. According to interpersonal theory, intimacy development primarily occurs through interpersonal relationships, especially parent–child ones. Parents have an impact on an individual's competence to form intimate bonds in later life. Distorted early interpersonal relationships result in anxious attachment, trust issues, and social anxiety, which may facilitate engagement in CSBs as a means of searching for connection [65].

A good relationship with same-sex parents has been associated with less severe CSB symptoms [66]. Also longitudinal data (repeated measurements after a 6-month period) point to the importance of the relationship with parents: maternal support and a high degree of communication with the father accounted for lower CSBD symptoms [67]. Moreover, in a large nationwide survey, the history of separation from parents during childhood was a risk factor for the development of CSB symptoms in adulthood [68]. However, contrary evidence exists—adverse childhood experiences did not predict the severity of sex addiction, but the relationship was mediated by anxious attachment [69].

A qualitative study of people with self-perceived sex addiction allowed for the identification of characteristics that may be common in the families of people experiencing dysregulated sexuality and pose risk factors for the development of CSBs [70]. These characteristics include rigid interactions that involve the neglect of a child's emotional needs, a lack of respect for the child's individuality, and a lack of proper monitoring [70, 71]. Another issue regards the existence of addiction problems in the family of origin and modeling positive attitudes towards those behaviors [70, 72].

Another phenomenon that can reflect the quality of bonds with parents concerns child abuse. Emotional, physical, and sexual abuse, as well as neglect, have been consistently linked to CSBD and PPU symptoms in empirical studies, and abuse is now a defining feature of one of CSBD's developmental courses described in ICD-11 [1]. However, it should be noted that regarding sexual abuse, both a complete avoidance of sexual activities as well as excessive compulsive behaviors can be observed equally frequently in people who experienced sexual abuse in childhood [73]. This topic is however beyond the scope of this review and is elaborated on in a recently published systematic review, see [74••].

Intimate Relationship Quality

Another factor that can potentially play a significant role in CSBs' development and maintenance is the quality of bonds in romantic relationships. Sexual compulsivity, which is regarded as an intimacy disorder, can be defined as "an inability to share sexuality with a freely chosen intimate partner" ([10], p. 225). For example, problems in intimacy (operationalized as fear of abandonment, exposure or rejection, and shame) predicted cybersex addiction symptom severity [75]. Also, data collected for the Sexuality and Health Project [76] showed that for both men and women, a current stable sexual relationship was a protective factor against CSBs, while discussing possible separation with a

stable partner was associated with higher CSBs symptom severity [68]. MSM frequently reported that the termination of intimate relationships served as a factor that triggered the relapse of CSBD [77]. Surprisingly, in a group with comorbid CSB and borderline personality disorder (BPD), the majority of individuals did not meet the BPD criterion of having unstable and highly intense interpersonal relationships [78]. The significance of relationship quality as a moderating factor was also found for self-perceived addiction to pornography—the relationship between frequency of pornography use and feelings of loss of control over pornography use was weaker when the satisfaction from the intimate bond was higher [79].

In most studies, the reverse influence was however studied; for example, the investigation of the influence of pornography use on relationship quality yields ambiguous results, see [43]. Nonetheless, it should be noted that most existing data is cross-sectional; hence, inferring causal relationships and their direction must be done cautiously. In previous work, it was proposed that problematic pornography use can lead to poorer relationship quality [23] and has been in some cases identified as the most significant cause of separation or divorce [80]. A similar association was found for relationships of homosexual men: sexual compulsivity had an impact on the quality of relationships, leading to reduced sexual communication and satisfaction [41]. Men who experienced sexual abuse in childhood claimed that their relationships were negatively influenced by CSBs; they also reported that they lacked emotional intimacy in sexual contacts [81], while data pointing to a greater longing for intimacy among pornography users is also available [82].

Relationship anxiety regarding pornography use was greater for individuals who perceived their pornography use as problematic [83]. It was proposed that social support can explain these relationships, as lower social support has been connected to higher self-perceived addiction. According to qualitative analysis of reports of partners of people experiencing PPU, disclosure of pornography use was always associated with difficult emotions; however, its concealment had even worse effects on partners' psychical and relational well-being [80, 84]. Voluntary disclosure was associated with higher trust and relationship satisfaction and negatively related to the number of relapses [85]. Also, emotional ambivalence of female partners of men who use pornography compulsively is emphasized, that is, they experience their partners as psychologically absent, but physically present, creating feelings of helplessness, which can lead to, for example, relationship conflicts [86]. Self-perceived addiction also mediated the relationship between pornography use and relational outcomes such as stability and satisfaction [87]. It was suggested, however, that the reverse influence may also be possible—that pornography use is perceived as problematic by the other partner which creates circumstances that can lead to lower relationship stability. This hypothesis needs to be verified in future empirical studies.

The abovementioned results suggest possible complex bidirectional effects of relational factors and CSBD/PPU. Although most of the studies on the quality of intimate relationships and their associations with CSBs employ a cross-sectional design, causal influence is often inferred, which may be justified by the fact that significant impairment in the social sphere is included in the description of CSBD in ICD-11 [1]. However, the nature of those relationships should be disentangled in future longitudinal studies. Another significant limitation of the existing studies is the fact that more research on romantic dyads is needed to be conducted in a clinical context, as existing studies are most often based on the participants' perception of pornography use as problematic rather than on clinical assessment. This issue was pointed out in a recent review related to this subject [88].

Minority Stressors

A group of social factors that is specific to minority groups and can be investigated in the context of mental health includes minority stressors. The minority stress model [89] posits that sexually diverse individuals experience unique stressors because of their minority status. They often endure prolonged psychological distress, resulting in poorer mental health outcomes. Distress may be attributed to factors that can be divided into distal (located in the social environment, e.g., experiences of discrimination due to sexual orientation) and proximal stressors (inner processes that can be attributed to the individual's psychological functioning, e.g., internalized sexual stigma).

A measure of minority stress reflecting the safety of close social bonds, as well as determining the amount of support received from the environment, can be the disclosure of sexual orientation. Sexual compulsivity among adult MSM was predicted by non-disclosure of sexual orientation to the mother; disclosure to the father had no impact on the severity of CSB [49]. Non-disclosure to parents could have been, in turn, motivated by elevated levels of internalized homophobia [90]. Previous studies have demonstrated that men who experienced high levels of internalized heterosexism were less likely to disclose their same-gender attractions to their parents [90]. Internalized homonegativity has been found to predict a greater frequency of sexual compulsivity of MSM chatroom users [91], as well as predict PPU severity among sexually diverse cisgender men and women [39].

Another study, which underscores the significance of social factors in explaining the severity of CSB symptoms, demonstrated a positive link between distal stressors (specifically, childhood peer rejection and adulthood overt discrimination) and sexual compulsivity. In highly sexually

active gay and bisexual men, this relationship was found to be mediated by a proximal minority stressor, namely internalized homonegativity [92]. The experiences of heterosexist prejudice, discrimination, and rejection predicted the severity of CSBD symptoms among cisgender sexually diverse men and women [39].

In a randomized controlled trial, the symptoms of sexual compulsivity were effectively reduced through the implementation of LGB-affirmative, transdiagnostic cognitive-behavioral treatment [93]. It is important to highlight that this treatment approach specifically focuses on helping MSM cope with the challenges of stigma by addressing and mitigating minority stress processes.

The abovementioned studies show the positive relationships between minority stressors and CSBD/PPU symptom severity. Moreover, addressing those stressors in therapy was successful in diminishing CSB symptoms. The exact mechanisms behind this change should be further studied to develop better-tailored therapies for groups underrepresented in CSB research such as sexual minority individuals.

Couple Treatment

CBT-based approaches are currently most advised for the treatment of CSBs; however, they seem to put little emphasis on the attachment and creation of safe bonding. CSBs may be the reason for attachment injury [94], which occurs when one person is unavailable and unresponsive when their partner needs the care and support that we typically require from attachment figures [95]. Such incidents lead to deterioration of attachment between partners and can prevent its restoration. Advocates of Emotionally Focused Therapy for Couples posit that couple therapy should be introduced to restore safe attachment between the person experiencing CSBs and their partner (individual therapy is also advised before the partner is included) [96]. Such therapy should provide circumstances for the transparent sharing of emotions and can help heal attachment injuries caused by CSBs and help rebuild a safe bond in the couple [94]. The openness about the problem facilitates the recovery process [96]. The externalizing of the problem of addiction could lead to a shift in the recovery approach of the couple to mutually supportive teamwork in fighting against a problem.

A concept that is emphasized as beneficial in addressing attachment issues and was postulated to be incorporated into standard sex therapy is relational depth [97]. This means "a state of profound contact and engagement between two people, in which each person is fully real with the Other and able to understand and value the Other's experiences at a high level" ([98], p. xii). Contact between the therapist and the client characterized by relational depth may facilitate bonding with the other person in different than up-to-date, not disorganized, patterns and enhance therapy outcomes.

Another view reported in clinical practice is the perception of addiction not only as the phenomenon distorting the relationship but also as a source of bond maintenance, which if taken away—disrupts homeostasis [29]. However, this again highlights the importance of working with the couple in the case of sex addiction.

Individual Treatment

The significance of social factors for the recovery process from CSBD/PPU has also often been emphasized by members of self-help groups, as well as participants of treatment programs dedicated to people experiencing those symptoms. For example, a commonly mentioned factor regards the opportunity to contact and receive support from other members in between group meetings [99]. Members of Sexaholics and Sex Addicts Anonymous report the importance of sharing difficult emotions with other participants, as well as appreciation of the time spent with others on meaningful activities [100]. Another significant issue mentioned by the participants was the ability to provide support to others.

In 12-step approach programs, the number of months of abstinence, as well as the step number, and higher attendance frequency (identified as measures of engagement) were associated with lower social support [101]. Reasons for such a correlation need to be disentangled in future studies. It may be possible that support may be the highest at the initial stages of the treatment process and may decline over time; for example, levels of social support were shown to decline for cancer patients in the course of the treatment [102, 103]. Another possible explanation is that an individual may be less willing to disclose or able to recognize their lack of support at the beginning of treatment. Also, treatment may lead to rupture or reformulation of the perception of some relationships.

The creation of a long-term support network is also one of the key objectives of psychoeducational groups that were successful in decreasing CSBD symptoms [104]. The qualitative analysis of the participants' opinions pointed out that group cohesiveness was one of the most important healing factors [105]; it allowed for experiences to be shared in a safe setting [106] and promoted shame reduction [105]. Also, it provided an opportunity for relationships to be formed [107] that lasted outside the course and became a source of long-term support [105]. Social support provided by other members of the group also between the group meetings can be an important factor contributing to the healing process [99]. Also, according to therapists, therapy aims to teach models that will allow for secure attachment to members of therapy groups, as well as family and friends [29]. Teaching an individual to recognize the characteristics of

insecure attachment styles and facilitate the choice of a partner that presents secure attachment may be crucial to promoting an environment that allows for the development of secure attachment in the affected individual [10].

It is also noteworthy that mindfulness-based interventions have been found promisingly successful in reducing CSB symptom severity [108–110], as well as in preventing relapse [109]. At the core of mindfulness-based approaches lies effective emotion regulation [111]. This seems especially important in the therapy of people experiencing CSB, who have been shown to have emotion regulation difficulties [112–114]. For example, CSB symptoms were associated with experiential avoidance [115–117], which is a core psychological difficulty underlined in acceptance and commitment therapy approach [118]. This aspect of CSB should also be considered in the context of loneliness' associations with CSB symptom severity (discussed in the above sections), as well as in the context of other difficult feelings, such as shame or guilt, experienced in relation to CSBs.

The abovementioned studies clearly show the subjective importance of social support in the recovery process. However, it is essential to take into account the targeted population to provide the best-tailored treatment; for instance, couple therapy could be particularly advantageous for individuals in romantic relationships [51]. Another issue regards the success of mindfulness-based therapeutic approaches [108–110], which is likely due to improvements in emotion regulation skills [111]. This aspect of treatment also seems crucial given the role of loneliness in CSBs discussed above, as well as other emotions experienced in the social context. More studies are needed to confirm the role of specific social factors in treatment adherence and outcomes and explain the underlying working mechanisms.

Limitations and Future Directions

Although the literature points to significant associations between social factors and the severity of CSBs, most studies have limitations that make inferring causality impossible. However, the existing data points to a possible supporting role of social factors in the development and maintenance of CSBs. This hypothesis is supported by data both from community and clinical samples. It should be noted, however, that the reverse influence is also widely discussed in literature exploring the impact of CSBD and PPU symptoms on the quality of social bonds. The often neglected aspect of studies is controlling for the type of sexual activities (e.g., online vs. offline behaviors), as they can be differently associated with social factors and partially account for the complexity of the associations. It is also crucial to emphasize that the intricate connections between sexual behaviors and social factors could be influenced by the cultural context [119]. Hence, these associations should always be studied in relation to the cultural environment, and the generalizability should be treated cautiously.

Moreover, the present review discusses the data from a wide variety of studies. However, due to differing methodologies and differing statistical approaches, it is hard to reliably compare the results of the studies. Multicentered projects that include standardized procedures across populations are needed to disentangle the relationships between variables such as the International Sex Survey, see [120]. Another issue that should be implemented in designing future studies is to make all the datasets available to promote transparency and allow for the replication of the analyses by other researchers. However, data security concerns should also be noted.

There are also still many avenues for exploring social factors' role in CSBD and PPU. It would be advisable to investigate the role of interpersonal emotions and interpersonal emotion regulation in participants experiencing symptoms (for interpersonal emotion regulation in various psychiatric disorders, see, e.g., [121–123], as well as belongingness, see [124], or identification with one's group for associations with mental health refer to, e.g., [125–127]). The topic of moral disapproval could also be further explored as there are different reasons for why people disapprove of pornography use that can be considered in an interpersonal context [128], for example, taking into account their partner's objections and the fear of hurting them or the concern about ethical production of the pornographic material. Another avenue for research regards the investigation of social factors and CSBs in the neuroimaging paradigm. Specific brain activation patterns have been found, for example, for social support, see [129], or rejection, see [130], and those patterns should also be studied in patients with CSBD and PPU. Employing other biological measures in study designs is also advisable; for example, social rejection and loneliness were linked to cortisol and intranasal oxytocin levels, see [131–133].

Future studies should address these shortcomings and explore these venues to disentangle the associations of social factors and CSBD and PPU, while also taking into consideration groups more vulnerable to developing the disorder, for example, sexually diverse individuals [134] or groups underrepresented in CSBs research, e.g., women, see [135••].

Conclusions

To sum up, empirical evidence supports the role of social factors, such as loneliness, perceived social support, attachment anxiety and avoidance, minority stressors, child-parent relationships, and the quality of romantic bonds, in the development, maintenance, and treatment of CSBD and PPU. Social factors should also be considered in clinical practice as they were found to facilitate the treatment

process. The existing studies, however, differ vastly in their methodologies and statistical approaches making it hard to disentangle and draw firm conclusions about the exact nature and strength of the relationships. One of the main questions when considering the role of social factors in CSBD and PPU regards the direction of the relationships and the causality. Therefore, more longitudinal data from multicentered projects with standardized methodologies are needed, as well as broader implementation of open science practices.

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Declarations

Competing interests The authors declare no competing interests.

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Compulsive Sexual Behavior Disorder and Problematic Pornography Use in Cisgender Sexual Minority Individuals: The Associations with Minority Stress, Social Support, and Sexualized Drug Use

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ABSTRACT

Compulsive Sexual Behavior Disorder (CSBD), recently recognized in the ICD-11 as an independent disorder, has been shown to be more prevalent in sexual minorities. However, we still lack studies investigating which factors contribute to CSBD and related behaviors in this group. In our cross-sectional study, we investigated the relationships between characteristics potentially contributing to CSBD and problematic pornography use (PPU) in sexual minority individuals: sexual minority stress (internalized sexual stigma, discrimination experiences, and openness about one's sexual orientation), perceived social support, and sexualized drug use (also more prevalent in sexual minorities). We adjusted for gender, age, sexual orientation, and the frequency of sexual behaviors. Cisgender sexual minority participants (n = 198, 72.7% men, 27.3% women; M_{age} = 27.13, SD = 7.78) completed an online survey. We conducted a two-step linear regression. In the first step, we introduced sociodemographic variables and the frequency of sexual activities. In the second step, we placed the predictors of main interest: perceived social support, minority stress measures, and the frequency of sexualized drug use. Our results showed that social support was negatively related to CSBD, while experiences of discrimination due to sexual orientation and engagement in sexualized drug use were associated with higher CSBD symptom severity. Internalized sexual stigma related to greater PPU severity. The discussed relationships were weak to moderate in strength. Implications of current results for therapy and diagnosis of CSBD in sexual minorities are discussed. The role of minority stressors and other factors specific to sexual minorities requires further exploration to design well-suited therapeutic interventions.

Introduction

The inability to control one's sexual thoughts, impulses, and behaviors has been recently conceptualized as compulsive sexual behavior disorder (CSBD) in the International Classification of Diseases, 11th revision (ICD-11; World Health Organization, 2023) and characterized by (1) a preoccupation with the sexual sphere, (2) impaired control in this domain that leads to (3) adverse consequences, as well as (4) relapses when an individual tries to cut down on or refrain from sexual activity (5) while sexual behaviors are not or are less satisfying than in the past. The disorder's most prevalent behavioral representation is excessive pornography use often conceptualized as problematic pornography use (PPU; de Alarcón et al., 2019; Kraus et al., 2020). PPU is characterized by a preoccupation with pornography to the point that it causes distress and leads to negative consequences, with pornography use also being employed as a possible coping strategy to deal with difficult emotions (see: de Alarcón et al., 2019). CSBD extends beyond pornography use and encompasses other non-paraphilic sexual behaviors and PPU is often thought of as the most prevalent subtype of the disorder (see: Antons & Brand, 2021). Research investigating the disorder's neurobiological basis (see: Stark et al., 2018), diagnosis (see: Antons & Brand, 2021), and treatment (see e.g, Antons et al., 2022; Borgogna et al., 2022) has flourished which is reflected by the increase in publications on CSB in last several years (Kraus et al., 2016).

However, there is still an urgent need to explore protective and risk factors in understudied groups that are especially vulnerable to developing this disorder, e.g., sexual minorities (e.g., Black, 2000; Dickenson et al., 2018; Kelly et al., 2009). Sexual minorities refer to "a diverse population inclusive of lesbian, gay, bi+ (e.g., bisexual, pansexual, queer, fluid), and asexual sexual orientations"; sexual minorities include all individuals who are not exclusively attracted to or only have sexual contact with people of the opposite gender (American Psychological Association, 2021). According to the Minority Stress Model (Meyer, 1995), they can be subject to stressors connected with the discrimination they experience. These stressors cause prolonged stress and can be considered risk factors for developing mental health problems (e.g., Kuyper & Fokkema, 2011; Lehavot & Simoni, 2011; Pitoňák, 2017). It is noteworthy that the model initially referred to the experiences of only homosexual and bisexual individuals; however, in later studies this framework was expanded and also used to

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investigate mental health among other gender and sexual minorities members, such as asexual, pansexual, or queer individuals (Chan & Leung, 2023; Feinstein et al., 2022; Meyer, 2015; Terra et al., 2021). Another possible risk factor is sexualized drug use (ingestion of psychoactive substances in order to prolong, enhance, or sustain sexual activity) which has been shown to also be more prevalent in sexual minority individuals (Edmundson et al., 2018). The role of engaging in chemsex in the development of CSBD has been discussed in the literature (e.g., Malandain et al., 2020), but we still lack direct quantitative evidence regarding the relation between sexualized drug use, and CSBD and PPU (Obarska et al., 2020). Of similar importance is the investigation of protective factors, e.g., social support, which has been linked to CSBD in previous research (Wizła et al., 2022), as well as its importance in protecting against mental health problems in sexual minority groups (McDonald, 2018). Therefore, in our study, we aimed to investigate the relationship between experienced stigmatization as well as internalized sexual stigma [defined as the acceptance of society's negative ideology about sexual minorities and its incorporation into one's value system (e.g., Lingiardi et al., 2012)], social support, and sexualized drug use and the severity of CSBD and PPU symptoms in sexual minorities.

CSBD is a recently introduced diagnostic entity, and in past research, it had been conceptualized in different ways and studied under different names, e.g., as sexual addiction (Carnes, 1983) or hypersexual disorder (Kafka, 2010). Following other work in this area (e.g., Kraus et al., 2016; see also: Grubbs et al., 2020), the term compulsive sexual behaviors is used in the following sections to collectively describe these types of out-of-control non-paraphilic sexual activity (the most frequently reported types of such behaviors include: excessive pornography use or masturbation, frequent use of paid sexual services, numerous casual partners (e.g., Kafka, 2010; Reid et al., 2012).

Sexual Minorities and CSB

There exists evidence for a higher risk of and more frequent compulsive sexual behaviors among sexually diverse individuals with studies reporting a 3-4-fold increase in the probability of manifesting compulsive sexual behaviors (CSBs; Dickenson et al., 2018). Although feminine individuals remain underrepresented in the research on CSB, both in heterosexual and sexually diverse samples, the existing data point to a higher severity of symptoms among both sexually diverse men, as well as women (Black, 2000; Bőthe et al., 2018; Kelly et al., 2009; Parsons et al., 2013, 2015). This can be partially attributed to earlier pornography use onset or more frequent pornography use among sexually diverse adolescents (Bőthe, Vaillancourt-Morel et al., 2020; Lim et al., 2017) as these patterns can be a risk factor for PPU (see: Bőthe et al., 2019). We came across one study with contrary results, suggesting no significant differences in the proportion of sexually diverse individuals in groups reporting CSB or CSBD (Briken et al., 2022). Authors of the study, however, claimed that the probable explanation for these results should be sought in culture-specific factors and requires further investigation. Although these differences in CSB prevalence exist between sexual minority groups and heterosexual individuals, little research has investigated minority-specific factors, which may put marginalized groups at a higher risk of CSBD. Indeed, investigating prevalence and factors contributing to CSB in minority groups, including sexual minorities, has indeed been outlined as one of the major research aims that CSB researchers should tackle to move the field forward (Kraus et al., 2016). These aims also served as the main focus of the current study.

Minority Stress

Sexual minority members experience prolonged psychological distress which leads to poorer mental health outcomes e.g., higher rates of depression, anxiety, substance abuse, and suicidality (e.g., Kuyper & Fokkema, 2011; Lehavot & Simoni, 2011; Pitoňák, 2017). According to the minority stress model, the distress experienced by sexually diverse individuals can be accounted for by proximal (i.e., expectations of rejection, concealment of one's sexual orientation from others, and internalized homophobia), and distal (i.e., prejudice events) minority stress processes (Meyer, 2003). The impact of minority stress on physical (see: Flentje et al., 2020) and mental health (e.g., see: Rooney et al., 2018) has been well documented. However, we found no studies investigating the role of minority stress in compulsive sexual behavior development and found only limited evidence on minority stress predicting sexual compulsivity (Chaney & Burns-Wortham, 2015; N. G. Smith et al., 2018).

Social Support

Minority stress as described above can also reveal itself in low levels of perceived social support (i.e., when a person perceives him/herself as not accepted by others or as an "other"/outsider, the level of felt social support is also lower). High social support was hypothesized to be a crucial protective factor for psychological well-being among sexually diverse individuals (Hershberger & D'Augelli, 1995). The literature on sexually diverse people shows both direct and stress-buffering effects of social support on mental health (Szymanski & Chung, 2001; Wayment & Peplau, 1995). A recent review of studies on LGBT adolescents showed that higher social support was associated with a lower severity of depressive and anxiety symptoms, as well as with fewer risky sexual behaviors or substance misuse (McDonald, 2018). On the other hand, loneliness was found to be a risk factor for developing problematic sexual behaviors (Dhuffar et al., 2015; Efrati & Amichai-Hamburger, 2019; Torres & Gore-Felton, 2007). Higher social support may also reduce distress related to minority stress (Diplacido, 1998; Ehlke et al., 2020; Verrelli et al., 2019); for example, it can buffer the negative effect of internalized sexual stigma on complaints about health (Szymanski & Chung, 2001). Social support also had a buffering effect on the relationship between exposure to discriminating messages in media and depressive and anxiety symptoms (Verrelli et al., 2019). Of note, the buffering effect was supported by the immediate social network (Verrelli et al., 2019), but not distal sources of support such as state agencies, for example, HIV organizations (Heywood & Lyons, 2016). Friends from the LGBQ community seem to play an especially

important role in providing sexuality-related support and alleviating minority stress (Doty et al., 2010; Frost et al., 2016).

The relationship between social support and minority stressors seems bidirectional. On one hand, sexually diverse individuals who perceive that they receive less support experience more severe minority stress. On the other hand, internalized homonegativity and concealment of one's sexual orientation (i.e., higher sexual minority stress) also predict lower activation of resources such as perceived social support, and greater feelings of loneliness (Lehavot & Simoni, 2011; Whitehead et al., 2016). This results in poorer mental health outcomes (Lehavot & Simoni, 2011).

One study yielded surprisingly conflicting relationships – sexuality-specific support had no buffering effect between microaggressions and depression in a sample of Dutch sexual minority youth. However, this may be attributed to differences between the studied countries in their treatment of LGBT communities (Kaufman et al., 2017). Also, the differences may stem from the fact that this study concentrated on social support in the narrow context of supporting one's sexual identity (i.e., a subjective report of one's parents and peers accepting one's sexual identity, as well as LGBT community connectedness), while most previous studies, as well as our work, aimed to investigate the amount of general social support that individuals perceive they receive. At the same time, the results of the above study show that the role of social support for mental health in LGBT individuals may not be straightforward (i.e., it may depend on other moderating factors) and still requires further study.

Sexualized Drug Use

Sexualized drug use or "chemsex" is conceptualized as the intake of psychoactive substances to prolong, enhance or sustain sexual activity. The sources of resilience (such as high levels of self-esteem and social support) and stimulant use were found to be mediators between minority stress and sexual risk behaviors (Storholm et al., 2019). The prevalence of sexualized drug use in sexual minorities is estimated to be higher than in heterosexual individuals and among men who have sex with men (MSM) is estimated to be between 4 and 43% (Edmundson et al., 2018). The results regarding the relation of social support to drug use among gay, bisexual, and other MSM remain mixed, providing evidence for social support's protective role against risky sexual behaviors (Shuper et al., 2018), as well as identifying connectedness to the sexually diverse community as a factor promoting drug use (Wei et al., 2012). MSM who engaged in chemsex compared to MSM who did not engage in chemsex were found to present more severe depressive, anxiety, and somatization symptoms, but the rate of clinically developed symptoms did not differ between groups (Bohn et al., 2020). Despite the prevalence of the phenomenon, whether chemsex is the manifestation of CSBD involving drug use or a separate entity still needs to be disentangled (Obarska et al., 2020). As sexual minority participants are at a higher risk of engaging in chemsex and its negative consequences, and because the available research on this topic is still very scarce, we decided to investigate chemsex engagement as a factor potentially related to CSB.

Present Study

In our study we aimed to explore the relationships of social support to CSBD and PPU in a group of sexually diverse individuals who are at higher risk of developing CSBs (e.g., Bőthe et al., 2018; Dickenson et al., 2018; Parsons et al., 2015). We identified those individuals who reported being sexually attracted to or undertaking sexual activities not only with people of the opposite sex or reported no sexual attraction toward any genders (i.e., reported non-heterosexual orientation as sexually diverse individuals. As social support is sometimes claimed to be one of the most important factors predicting psychical well-being for members of sexual minorities (Hershberger & D'Augelli, 1995), while minority stress can negatively influence it (e.g., Grant et al., 2014; Pollitt et al., 2017), we decided to explore how social support and minority stress are related to CSBD and PPU in a group of sexually diverse individuals. Due to the high prevalence of chemsex (e.g., Edmundson et al., 2018) and increased risk of CSB (see e.g., Bőthe et al., 2018; Kelly et al., 2009; Parsons et al., 2015) among LGB individuals, we decided to explore the relationship between these variables. It has already been proposed that chemsex plays a significant role in CSBD development, but it has yet to be empirically validated (Obarska et al., 2020), which also motivated our analysis. Lastly, drug use was also linked to CSB in previous studies (Kraus et al., 2021), at least indirectly suggesting that chemsex may be significantly associated with CSB.

To the best of our knowledge, the discussed variables have not been studied collectively in previous studies and the associations between minority stress dimensions and CSBD as well as PPU have not been quantitatively investigated. Therefore, we decided to use a cross-sectional design for our initial study to collect preliminary evidence for the existence of relationships between the variables. If associations between the variables of interest are found, they can be further explored in future longitudinal studies.

We decided to investigate the role of the discussed factors not only for CSBD, but also for PPU. PPU is purported to be the most prevalent behavioral symptom of CSB and is most frequently reported by treatment seekers (Gola et al., 2016; Kafka, 2010; Reid et al., 2012). It thus merits research attention. Next, a significant number of researchers conceptualize PPU as a special case of technology-mediated internet addiction, with features at least partially distinct from CSB, which does not have to be based on online behavior (Brand et al., 2019).

Hypotheses

Based on the existing literature, we hypothesized that a higher level of minority stress (operationalized as: experiences of heterosexist discrimination, internalized sexual stigma, and nondisclosure of one's sexual orientation) will be associated with a higher level of CSBD (*Hypothesis 1* [*H1*]) and PPU (*H2*) symptom severity. We also predicted similar associations of sexualized drug use with CSBD (*H3*) and PPU (*H4*) symptom severities. However, we assumed that a higher level of social support will be related to lower CSBD (*H5*) and PPU (*H6*) symptom severities.

As mentioned previously, PPU is mostly constrained to solitary sexual activity, while CSBD also encompasses dyadic sexual activity. Due to this, we wanted to additionally explore whether there may be differences in how minority stress affects CSBD vs. PPU. We expected that interpersonal experiences of discrimination may be more strongly associated with characteristics describing dyadic relations, including dyadic sexual relations (e.g., by forming expectations of discrimination and rejection in interpersonal relations) than solitary sexual activity and thus be more strongly associated with CSBD than PPU symptom severity. However, due to not enough empirical data to firmly support such prediction, we treated this issue as an exploratory research question.

Compulsive sexual behavior severity, factors predicting PPU and CSBD, as well as the strength of predictors may differ between men and women (e.g., Lewczuk et al., 2017; see also: Kowalewska et al., 2020, 2022). We expected that the differences in the severity of symptoms and the strength of predictors of CSB will also be observed in sexually diverse individuals. We based our predictions on previous research showing that among sexually diverse participants, similarly to heterosexual individuals, men presented more severe symptoms of CSB (Bőthe et al., 2018; Kelly et al., 2009). Moreover, for sexually diverse men and women, the strength of CSB predictors differs. For example, for sexually diverse men, the strongest predictors of CSB were frequencies of sexual activity. For sexually diverse women, variables related to coping with difficult emotions were more prominent (Bőthe et al., 2018). However, it is important to note that similar data is more scarce for sexually diverse individuals, as this group is underrepresented in CSB research and our study aimed to help fill this gap in the research. Similarly, predictors and their strength may differ depending on sexual orientation; for example, bisexual individuals reported experiencing double discrimination leading to more severe minority stress (Feinstein & Dyar, 2017; Pakula et al., 2016) and poorer mental health outcomes than homosexual individuals (see: Ross et al., 2018). Also, among sexual minorities, certain aspects of mental health outcomes may vary between different sexual orientation groups. For example, in one study pansexual, demisexual and asexual individuals reported more severe depressive and anxiety symptoms than homosexual individuals (Borgogna et al., 2019). The authors hypothesized that the poorer mental health outcomes among individuals with "emerging identities" (i.e., pansexual, demisexual, and gender nonconforming) can reflect more severe discrimination experiences, which may also originate from other members of sexual minority groups, for example, from those with a homosexual identity [the existence of binegative stereotypes among the gay/lesbian community has been supported in previous studies (e.g., Dyar et al., 2017; Hayfield et al., 2014)]. Moreover, in representative samples, age was predominantly negatively and weakly associated with the severity of CSB symptoms (e.g., Grubbs et al., 2019; Lewczuk, Wizła, Glica, et al., 2022; Lewczuk, Wizła, & Gola, 2022). Due to the above-mentioned relationships, we decided to take into account gender, sexual orientation, and age in our analyses.

Method

Procedure and Sample

The reported study had a cross-sectional design. Participants were adult Polish citizens who completed a set of online measures via the Qualtrics research platform from April until July 2022. The participants were recruited via social media posts in groups related to the LGBT+ community or sexuality. The final sample included in the current analysis consisted of 198 participants (M_{age} = 27.13, SD = 7.78) out of 828 participants who started the survey, i.e., clicked the survey link). We included in the analysis all sexual minority participants (participants who chose any of the sexual minority categories: homosexual, bisexual, asexual, pansexual or polysexual; only one answer option with regard to sexual orientation was allowed) who completed the measures relevant to the study (described in the *Measures* section below). Participants who were under 16 years old and heterosexual participants were not included in the current analysis. Moreover, transgender, nonbinary, and intersex were also excluded from the analyses.[1] We included in the study only participants who declared a feminine or masculine gender (we excluded participants who chose the following answer options: *I have no gender (agenderism)/ My gender is fluid (genderfluid)/ I identify myself in terms of more than one gender category/ I don't identify myself in terms of gender categories/ Other*). Lastly, participants who answered "other" or "not sure" to the question about their sexual orientation were not taken into account in our analysis, as they could not be unambiguously assigned to any of the sexual minority categories. General methodology, the complete measure set as well as the overarching aims of the study were preregistered before conducting the study using the OSF platform. The preregistration protocol is available using the link: OSF preregistration link.

The resulting sample consisted of 144 participants who identified themselves as men (72.7%), and 54 women (27.3%). Regarding sexual orientation, 74.2% of participants (n = 147) identified themselves as homosexual, 17.7% (n = 35) as bisexual, 4.0% (n = 8) as asexual, and 4.0% (n = 8) as

[1]We did not include transgender, nonbinary, and intersex participants in our analysis as: (1) we intended to focus on non-heterosexual orientation as a source of sexual minority status; (2) transgender, nonbinary, and intersex participants did not receive measures of internalized self-stigma related to their sexual orientation in our survey; (3) for transgender, nonbinary, and intersex participants other sexuality-specific factors, which were not controlled in the current analysis, could significantly influence our dependent variables; (4) we did not collect a sufficient number of transgender, nonbinary and intersex participants to conduct a separate analysis on how gender minority stress influences CSBD and PPU. Conducting similar analysis for gender minority participants should be one of the priorities for future research; however, it wasn't possible based on our survey. To decide whether a participant is transgender or intersex we relied on their self-declaration. If participants answered yes to the question: *"Are you a transgender person? We define transgenderism as any form of incongruency between the gender assigned at birth (as stated in the birth certificate) and gender identity (the feeling of belonging to a specific gender, experiencing and identifying yourself as a woman, man, or another gender)"* or to the question: *"Are you an intersex person? We define intersex people as ones who are born with sex traits (i.e., inner and outer genitalia, gonads, and chromosome patterns) that do not fit in with social or medical definitions"*, they were identified as transgender or intersex and were excluded from the analyses presented in the current manuscript. Moreover, only participants who answered yes to the item assessing gender congruency: *"My identity is congruent with the one recognized at birth"* were included in the analyses.

pansexual. More than half of the participants (n = 116; 58.6%) were in a romantic relationship (formal [married] or informal) and 41.4% (n = 82) were single.

Measures

Problematic pornography use was assessed with the 5-item (α = .84) Brief Pornography Screen (BPS) (validation of the Polish version: Kraus et al., 2020). The answer scale for each item was: 0 (*Never*), 1 (*Sometimes*), and 2 (*Frequently*). Higher scores reflect greater problems with managing pornography use characterized by, e.g., inability to resist urges or using pornography as a strategy to cope with difficult emotions.

Compulsive sexual behavior disorder symptom severity was measured with the Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bőthe, Potenza et al., 2020). We employed the Polish version of the measure used in previous research, both on convenience and representative samples (the Polish version was characterized by good reliability and validity indices; Lewczuk, Wizła, Glica et al., 2022; Wizła et al., 2022). The tool consists of 19 items (α = .92), with answers ranging from 1 (*Completely disagree*) to 4 (*Completely agree*). Higher scores reflect a greater intensity of symptoms as defined in the ICD-11 (World Health Organization, 2023): preoccupation with the sexual domain, negative consequences of sexual behaviors, impaired control in the sexual domain, unsuccessful efforts to control or reduce the behaviors, and continuing sexual activities despite dissatisfaction.

Frequency of sexualized drug use (chemsex) was assessed with a question (translated for the purpose of the current study)[2] asking how often in the past 12 months the person had engaged in sexual activities under the influence of psychoactive substances to make sexual activity easier or last longer, or to enhance the sexual experience. In line with previous research, the substances were specified as methamphetamine, mephedrone, GHB/GBL, or ketamine (e.g., see: Blomquist et al., 2020; Hibbert et al., 2019). The answers ranged from 1 (*never [in the last year]*) to 7 (*once a day or more often*).

Perceived social support was measured with the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988; Polish version: Buszman & Przybyła-Basista, 2017). The tool consists of 12 items (α = .90) measuring the perceived social support in three domains: family, friends, and significant other; the answer scale is from 1 (*Completely disagree*) to 7 (*Completely agree*). Higher scores imply that a person believes they receive emotional support and other kinds of help when in need and share both difficult and pleasurable internal experiences with close people.

We assessed experiences connected with *heterosexism* with the aid of the *Heterosexist Harassment, Rejection, and Discrimination Scale* translated into Polish for the purpose of the current study (E. R. Smith et al., 2020). The scale consists of 14 items (α = .91) that examine exclusion events in the past year due to belonging to sexual minority groups in three domains: harassment/rejection, work/school, and "other." Answers range from 1 (*the event has never happened to you*) to 6 (*the event occurred almost all of the time [more than 70% of the time]*). Higher scores mean that the respondent experienced more frequent events, such as being treated unfairly, being called heterosexist or derogatory names, being insulted, or being denied privileges due to sexual minority identity.

The *Revised Internalized Homophobia Scale* (IHP-R; Herek et al., 2009) was used to assess internalized sexual stigma. We used three separate versions of this measure depending on the sexual orientation declared by the participants. For measuring the internalized homophobia of homo- and bisexual individuals we used a version that had been used for this purpose in previous studies (e.g., Herek et al., 2009); sample item: "I feel that being lesbian/bisexual [gay/bisexual] is a personal shortcoming for me." For asexual and pansexual individuals, we adapted the scale, changing single expressions in the items (e.g., we changed "I wish I wasn't homosexual" to "I wish I wasn't asexual"). Each scale consisted of 5 items (α = .82), with answers ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). Higher scores are associated with an individual's hostility toward their sexual orientation and the desire to change it.

Outness Inventory (Mohr & Fassinger, 2000; Polish version prepared for the purpose of the current study; α = .77) was used to assess openness about one's sexual orientation. The participants are presented with 11 roles (e.g., mother, extended family, or work supervisors) and asked to indicate how open they were about their sexual orientation with this person/group of people. The possible answers range from 1 (*person does not know about your sexual orientation status*) to 7 (*person definitely knows about your sexual orientation status, and it is openly talked about*). Answer option 0 denotes "*not applicable/there is no such person/group of people in your life*" and is coded as missing data. A general score is calculated as the mean of items.

Frequency of Sexual Behavior

Following previous studies (Grubbs et al., 2019; Lewczuk et al., 2020, 2021), we assessed the frequency of sexual activity by asking participants how often they (1) viewed pornography, (2) masturbated, and (3) had sex with a partner within the past 12 months [8-point answer scale ranging between 1 (*never in the last year*) and 8 (*once a day or more often)* for viewing pornography and 7-point scale from 1 (*never in the last year*) and 7 (*once a day or more often*) for masturbation and partnered sex frequency].[3]

[2]Polish translations of the Heterosexist Harassment, Rejection, and Discrimination Scale, Outness Inventory, as well as the item measuring the frequency of chemsex, were created for the purpose of the current study. All the translations were prepared according to the same procedure. First, the original instruments were translated independently into Polish by two psychologists who can speak English fluently and who specialize in sexuality research. Later the two Polish versions were compared, and any differences were discussed to create the final version of the translations. In the case of disagreement, a 3rd researcher, fluent in English, and specializing in LGBT research and therapy, was consulted. The final version was accepted by both translators.

[3]Due to a coding error on our part, the answer options for sexual behavior frequency were slightly different. In detail, the questions about masturbation and partnered sex frequency lacked the "*once a week*" answer option. Thus, the resulting scales were as follows: for pornography viewing: (1) *never in the last year*, (2) *once or twice in the last year*, (3) *a few times in the last year*, (4) *once a month*, (5) *two or three times a month*, (6) *once a week*, (7) *a few times a week*, (8) *once a day or more often*); for masturbation and partnered sex frequency: (1) *never in the last year*, (2) *once or twice in the last year*, (3) *a few times in the last year*, (4) *once a month*, (5) *two or three times a month*, (6) *a few times a week*, (7) *once a day or more often*).

We also adjusted for *age* (in years), *gender* (feminine/masculine), *relationship status* (single/in a romantic relationship), and *sexual orientation* (homo/bi/a/pansexual).

Ethics

The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of The Institute of Psychology of the Polish Academy of Sciences approved the study. All participants were informed about the study and provided informed consent.

Statistical Analysis

First, we present descriptive statistics (Table 1) and analyze bivariate correlations (Table 2) for the analyzed variables. Next, we conducted a two-step hierarchical regression including problematic representations of sexual activity CSBD and PPU as predicted variables (Table 3).

In the first step, we adjusted for age, gender, relationship status, sexual orientation, and the frequency of various sexual activities (watching pornography, masturbation, and dyadic sexual activity). To include sexual orientation in the regression model we created 3 dummy variables with homosexual sexual orientation being the reference group: *Sexual orientation – bisexual, Sexual orientation – pansexual*, and *Sexual orientation – asexual*.

In the second step, we added the predictors of main interest, i.e., perceived social support, the experience of heterosexist discrimination, internalized sexual stigma, sexual orientation outness, and the frequency of sexualized drug taking.

We provided the standardized regression coefficients and 95% confidence intervals, as well as *p*-values for the effects. We used the Statistical Package for the Social Sciences (SPSS, IBM Corp., v.27, 2020) to perform all statistical analyses.

Linear Regression Assumptions

We inspected our data for possible outliers, normality, collinearity, and homoscedasticity.

We analyzed skewness and kurtosis values (Table 1) that were found to have acceptable values apart from a slightly elevated kurtosis value for the frequency of masturbation (Kurt = 4.55; SE = .34). Moreover, as predicted, the skewness (Skew = 3.82; SE = .17) and kurtosis (Kurt = 13.85; SE = .34) of the frequency of sexualized drug use were significantly elevated. This can be explained by the non-normative character and low occurrence of the measured activity.

We analyzed the potential outliers, based on the standardized values of error (using as cutoff value |3.29|;

Table 1. Descriptive statistics of the analyzed variables.

	Range	M (SD)	Mdn	Skewness (SE = .17)	Kurtosis (SE = .34)
Perceived social support (MSPSS mean)	1.00–7.00	5.02 (1.23)	5.17	−.65	.23
Heterosexist discrimination (HHRDS mean)	1.00–5.57	2.03 (.81)	1.86	1.28	2.05
Disclosure of sexual orientation (OI mean)	1.00–7.00	4.05 (1.42)	4.22	−.11	−.78
Internalized sexual stigma (IHP-R mean)	1.00–5.00	1.68 (.86)	1.40	1.69	3.09
Frequency of sexualized drug taking (chemsex)	1.00–6.00	1.25 (.89)	1.00	3.82	13.85
Frequency of watching porn	1.00–8.00	5.86 (1.87)	7.00	−1.06	.20
Frequency of masturbation	1.00–7.00	5.72 (1.23)	6.00	−1.92	4.55
Frequency of sexual intercourse	1.00–7.00	4.36 (1.61)	5.00	−.78	−.42
CSBD symptoms (CSBD-19 mean)	1.00–3.37	1.71 (.55)	1.53	.77	−.10
PPU symptoms (BPS mean)	.00–2.00	.42 (.49)	.20	1.30	1.12
Age	16.00–61.00	27.13 (7.78)	25.00	1.24	2.06

MSPSS = Multidimensional Scale of Perceived Social Support, HHRDS = Heterosexist Harassment, Rejection, and Discrimination Scale, OI = Outness Inventory, IHP-R = Revised Internalized Homophobia Scale, CSBD-19 = Compulsive Sexual Behavior Disorder Scale, BPS = Brief Pornography Screen.

Table 2. Correlation indices (Pearson's *r*) estimating the strengths of relationships between variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. CSBD symptoms (CSBD-19 mean)	-											
2. PPU symptoms (BPS mean)	.45**	-										
3. Perceived social support (MSPSS mean)	−.28**	−.18**	-									
4. Heterosexist discrimination (HHRDS mean)	.24**	.11	−.21**	-								
5. Disclosure of sexual orientation (OI mean)	−.09	−.18*	.45**	.05	-							
6. Internalized sexual stigma (IHP-R mean)	.09	.27**	−.20**	−.01	−.27**	-						
7. Frequency of sexualized drug use (chemsex)	.36**	.00	−.12	.09	.10	−.13	-					
8. Frequency of watching porn	.29**	.31**	−.06	−.01	.04	.04	.15*	-				
9. Frequency of masturbation	.25**	.28**	−.07	.04	.07	.09	.15*	.74**	-			
10. Frequency of sexual intercourse	.08	−.10	.26**	.13	.24**	−.07	.16*	−.05	−.06	-		
11. Age	−.21**	−.27**	.01	−.06	.13	−.16*	.13	−.16*	−.19**	−.09	-	
12. Gender	.27**	.30**	−.08	.11	−.09	.09	.11	.65**	.52**	−.04	−.07	-

*$p < .05$ **$p < .01$.

CSBD-19 = Compulsive Sexual Behavior Disorder Scale, BPS = Brief Pornography Screen, MSPSS = Multidimensional Scale of Perceived Social Support, HHRDS = Heterosexist Harassment, Rejection, and Discrimination Scale, OI = Outness Inventory, IHP-R = Revised Internalized Homophobia Scale.

Gender – woman (0), man (1).

Table 3. Results of multivariable linear regression: perceived social support, heterosexist discrimination, disclosure of sexual orientation, internalized sexual stigma, and the frequency of sexualized drug use predicting compulsive sexual behavior disorder and problematic pornography use symptoms.

	CSBD symptom severity				PPU symptom severity			
	Step 1		Step 2		Step 1		Step 2	
	β [95% CI]	*p*	β [95% CI]	*p*	β [95% CI]	*p*	β [95% CI]	*p*
Age	**−.14 [−.28, −.01]**	**.042**	**−.20 [−.33, −.07]**	**.003**	**−.24 [−.38, −.11]**	**<.001**	**−.20 [−.34, −.07]**	**.004**
Gender	.19 [−.00, .38]	.051	.12 [−.06, .30]	.187	.16 [−.03, .34]	.107	.08 [−.11, .27]	.399
Sexual orientation – bisexual	.07 [−.08, .21]	.359	.05 [−.09, .19]	.464	−.07 [−.22, .07]	.323	−.10 [−.24, .05]	.191
Sexual orientation – pansexual	.03 [−.11, .17]	.641	.03 [−.10, .16]	.638	−.00 [−.14, .13]	.958	.01 [−.13, .14]	.944
Sexual orientation – asexual	.01 [−.13, .15]	.886	−.03 [−.16, .11]	.694	.02 [−.12, .16]	.751	−.04 [−.18, .11]	.625
Relationship status	**−.21 [−.37, −.05]**	**.012**	−.01 [−.17, .14]	.859	−.01 [−.17, .15]	.888	.02 [−.15, .19]	.811
Frequency of watching porn	.10 [−.13, .32]	.402	.14 [−.07, .35]	.189	.12 [−.10, .35]	.271	.18 [−.04, .39]	.117
Frequency of masturbation	.02 [−.18, .22]	.826	−.02 [−.21, .16]	.826	.04 [−.16, .24]	.673	.02 [−.17, .22]	.811
Frequency of sexual intercourse	**.19 [.03, .34]**	**.020**	.06 [−.09,.22]	.419	−.10 [−.25, .05]	.203	−.08 [−.25, .08]	.309
Perceived social support (MSPSS mean)			**−.19 [−.33,-.04]**	**.016**			−.07 [−.23, .09]	.412
Heterosexist discrimination (HHRDS mean)			**.15 [.02, .28]**	**.024**			.07 [−.07, .21]	.318
Disclosure of sexual orientation (OI mean)			−.01 [−.16, .14]	.868			−.08 [−.24, .08]	.309
Internalized sexual stigma (IHP-R mean)			.06 [−.07, .19]	.385			**.19 [.05, .33]**	**.007**
Frequency of sexualized drug taking (chemsex)			**.32 [.19, .46]**	**<.001**			.02 [−.12, .17]	.744
F	**4.15 (<.001)**		**6.43 (<.001)**		**4.76 (<.001)**		**4.27 (<.001)**	
R^2_{adj}	.126		.278		.146		.189	
R^2 *change*	F(5, 183) = 8.95, $p < .001$				F(5,183) = 2.96, $p < .05$			

CSBD-19 = Compulsive Sexual Behavior Disorder Scale, BPS = Brief Pornography Screen, MSPSS = Multidimensional Scale of Perceived Social Support, HHRDS = Heterosexist Harassment, Rejection, and Discrimination Scale, OI = Outness Inventory, IHP-R = Revised Internalized Homophobia Scale.
Sexual orientation – dummy coded, reference group: homosexual (0), bi/a/pansexual (1).
Gender – feminine (0), masculine (1).
Relationship status – single (0), in a relationship (1).

Tabachnick et al., 2007). We found one outlier (363) for the model predicting CSBD symptom severity (standardized predicted error value: −3.61) and two outliers for the model predicting PPU symptom severity (374 [3.33] and 383 [3.29]). However, we decided not to exclude any participants, assuming that might reflect the actual variance of the sample.

The inspection of the normality plots of predicted values and residual values yielded possible aberrations; thus, we conducted a Breusch–Pagan test to check the homoscedasticity of our sample and found that the assumption of homogeneity of residuals variance was met for our models.

We also analyzed the variance inflation factor, with values below 3 indicating an acceptable level of multicollinearity (Becker et al., 2015), revealing no multicollinearity issues.

Additional Analyses

Lastly, as sexualized drug use especially among sexual minorities is a subject swiftly gaining research interest, even though the available data is scarce, we placed similar regression models predicting this variable in the Supplementary Material (as predicting sexualized drug use was not one of the main goals of the current work).

Results

Descriptive Characteristics and Correlations

In Table 1 we present the descriptive statistics for all the analyzed variables. In the Supplementary Material, further information on the descriptive statistics of the analyzed data regarding specific sexual orientation groups (Table S2), as well as descriptive statistics and differences between genders in variable means can be found (Table S3). Bivariate correlations for all variables included in the study are presented in Table 2.

Greater perceived social support negatively correlated with the severity of CSBD ($r = -.28$; $p < .01$) and PPU ($r = -.18$; $p < .01$) symptoms. Heterosexist discrimination measured by HHRDS was positively associated with CSBD ($r = .24$; $p < .01$) symptom severity. There was a negative correlation between disclosure of sexual orientation and PPU ($r = -.18$, $p < .05$). Internalized sexual stigma was positively related to PPU symptom severity ($r = .27$; $p < .01$). Engagement in sexualized drug use was moderately positively correlated with CSBD symptom severity ($r = .36$; $p < .01$).

The frequency of dyadic sexual activity showed no significant relationships with problematic sexual behaviors (CSBD: $r = .08$, $p = .24$; PPU: $r = -.10$, $p = .15$), while solitary sexual behaviors statistically predicted both CSBD (watching porn: $r = .29$, $p < .01$; masturbation: $r = .25$, $p < .01$) and PPU (watching porn: $r = .31$, $p < .01$; masturbation: $r = .28$, $p < .01$). Higher age was associated with lower CSBD ($r = -.21$; $p < .001$) and PPU symptom severity ($r = -.27$; $p < .001$).

All of the abovementioned relationships were low in strength, apart from the moderate correlations of chemsex with CSBD, and watching porn with PPU.

Occurrence of CSBD and PPU

We also calculated the occurrence rates of CSBD and PPU in the investigated sample; however, it was not one of the main aims of our study, as the current sample was not representative

and was limited in size. Thus, reported occurrence rates should be interpreted with caution due to the limitations of the sample, which is elaborated on further in the Discussion section. Based on the CSBD-19 cutoff score ≥50 (Bőthe, Potenza et al., 2020), 8.6% of the participants were estimated to be at high risk of CSBD (n = 17 out of 198), while 22.2% (BPS cutoff score ≥4; Kraus et al., 2020) were identified as potentially displaying symptoms of PPU (n = 44).

Minority Stress, Social Support, and Chemsex Predicting CSBD

Next, in line with our study aims, we conducted a hierarchical regression analysis in which the controlled variables were: age, gender, sexual orientation, relationship status, and frequency of various sexual behaviors (introduced in Step 1) and social support, heterosexist discrimination, sexual orientation disclosure, internalized sexual stigma and sexualized drug use (introduced in Step 2), predicting the problematic sexual behaviors (Table 3).

Results obtained for the model predicting CSBD symptom severity in Step 1 showed that higher age was a statistically significant negative predictor of the symptoms (β = −.14, p < .05). Also, being in an intimate relationship was associated with lower CSBD symptom severity (β = −.21, p < .05). Higher frequency of sexual intercourse was associated with higher CSBD symptom severity (β = −.19, p < .05).

In Step 2 greater perceived social support was found to be related to lower severity of problematic sexual behaviors (β = −.19, p < .05) which is in line with Hypothesis 5 (H5). H1 was partially corroborated: the experience of discrimination due to being a member of a sexual minority group was a risk factor for higher CSBD symptom severity (β = .15, p < .05). However, contrary to H1, no relationship between outness regarding one's sexual orientation (β = −.01, p = .868) or internalized sexual stigma (β = .06, p = .385) was found. H3 was supported: engagement in chemsex was related to a higher severity of CSBD (β = .32, p < .001).

Moreover, after introducing measures of minority stress, social support, and chemsex into the model, the relations of CSBD symptom severity to relationship status (β = −.01, p = .859) and the frequency of dyadic sexual activity (β = .06, p = .419) became non-significant.

The change in the amount of explained variance between Step 1 (R^2_{adj} = .126) and Step 2 (R^2_{adj} = .228) of the analyzed model was significant (R^2_{change} = .164, F = 8.95, p < .001).

Minority Stress, Social Support, and Sexualized Drug Use Predicting PPU

We introduced the same control variables in Step 1 and predictors in Step 2 into the model predicting PPU symptom severity.

When we adjusted for sociodemographic characteristics, sexual orientation, and the frequency of solitary and dyadic sexual activity in Step 1, only age showed a significant association with CSBD severity; it was a statistically significant negative predictor of PPU symptom severity (β = −.24, p < .001).

After introducing measures of minority stress, social support, and chemsex into the model, internalized negativity toward one's sexual orientation was found to be associated with greater PPU symptom severity (β = .19, p < .05), partially supporting H2. In contrast to H2, neither experiences of heterosexist discrimination (β = .07, p = .318) nor nondisclosure of sexual orientation (β = −.08, p = .309) were related to PPU symptoms. Sexualized drug use was not associated with PPU severity (β = .02, p = .744) which contradicts H4. H6 was also not supported – there was no relationship between social support and PPU (β = −.07, p = .412).

The change in the amount of explained variance between Step 1 (R^2_{adj} = .146) and Step 2 (R^2_{adj} = .189) of the analyzed model was significant (R^2_{change} = .061, F = 2.96, p < .05).

Discussion

Sexual minorities are characterized by a higher risk of developing CSBD and PPU (e.g., Black, 2000; Dickenson et al., 2018; Kelly et al., 2009). In addition, they experience minority stress that results in negative mental health outcomes (Meyer, 1995), while social support can alleviate those effects (Doty et al., 2010; Frost et al., 2016). Despite the existence of data supporting this theoretical claim for the previously outlined relations, research on the positive and negative correlates of CSBs, which should be investigated in future longitudinal studies as potential risk factors, is scarce. Moreover, researchers have previously proposed that sexual minorities may be at a higher risk of experiencing sexualized drug use, and this can in turn significantly contribute to a higher prevalence of CSB in this group (Obarska et al., 2020). However, this proposition has also not been investigated in research. Therefore, in our study, we investigated the relationships between social support, minority stressors, and chemsex engagement and their relation to CSBD and PPU in a group of sexually diverse individuals.

Minority Stress Predicting CSBD and PPU

Our results also showed that experiences connected with heterosexist discrimination, harassment, or prejudice were positively related to CSBD symptom severity (this result supports H1). The limited available data on relationships between minority stressors and CSBs is consistent with our results – sexual compulsivity was positively associated with experiences of discrimination (Pachankis et al., 2015; Pollitt et al., 2017). The outcome of our study offers evidence for the positive relationship between discrimination and the most common mental health symptom classes (Chakraborty et al., 2011; Evans-Polce et al., 2020; Russell et al., 2012).

In our study, PPU was positively related to internalized sexual stigma (evidence for H2). One possible explanation for this finding is that – as high negativity toward one's sexual orientation may be associated with more reluctance to act upon own sexual preferences with other people, individuals may prefer to turn to more covert forms of sexual behaviors which do not require such disclosure, including pornography viewing. At the same time, our study did not point to a significant relationship between disclosure of sexual orientation with PPU; thus, this result should be further investigated

and other explanations searched for. This result may also be explained by the claim that the most support is gained from minority friends (Doty et al., 2010; Meyer, 2010), while *Outness Inventory* measures disclosure in other social contexts (i.e., items regarding friends refer only to heterosexual individuals). This result is also consistent with studies showing that higher internalized sexual stigma is associated with greater compulsive pornography consumption (Noor et al., 2014), as well as sexual compulsivity (Pachankis et al., 2015). This is also in line with studies showing shame (Reid et al., 2014) and self-hostility (defined as a constituent of shame and characterized by self-criticism; Reid, 2010) was positively related to hypersexual behavior; however, both cited studies involved samples that consisted predominantly of heterosexual men.

Although not directly investigating CSBs, internalized sexual stigma has also been consistently linked to sexual risk behaviors (e.g., Johnson et al., 2008). However, the effect size for this association in most studies was weak and the strength of the relationship was lower in more recent years leading to doubts about the current utility of the construct (see: Newcomb & Mustanski, 2011). On the other hand, our result is consistent with a meta-analysis showing a stable moderately strong relationship between internalized homonegativity and mental health problems (see: Newcomb & Mustanski, 2010).

Some researchers claim that CSBs develop as a maladaptive strategy to cope with negative affect induced by discrimination due to belonging to a sexual minority group (Parsons et al., 2008). Problematic pornography use can be, in turn, perceived as a mood regulation strategy (e.g., Lewczuk et al., 2020; Sniewski & Farvid, 2020; see: Lew-Starowicz et al., 2020); this could explain a greater prevalence of CSBs among sexually diverse individuals.

Social Support Predicting CSBD and PPU

We found a negative relationship between social support and CSBD severity (supporting H5) which is consistent with other research (e.g., Dhuffar et al., 2015; Flores, 2004; Muench & Parsons, 2004). However, the effect size of the relationship was weak which hypothetically points to its rather supporting a secondary role in the development and maintenance of the disorder symptoms (this should be disentangled in future longitudinal studies). This is a similar result to two previous studies on Polish participants – one on a convenience sample and the other on a sample representative of the adult population (Wizła et al., 2022). The current study is, to the best of our knowledge, the first to show the relation of social support to CSBD among sexually diverse individuals; this offers evidence for social support's protective role against other mental health problems in this minority group (Hershberger & D'Augelli, 1995; McDonald, 2018; Szymanski & Chung, 2001).

Unlike previous studies (Wizła et al., 2022), we found no evidence for our current hypothesis (H6) that social support was related to PPU. However, it should be emphasized that previous studies involved predominantly heterosexual, convenience, and representative samples characterized by different sociodemographic characteristics than the sample in this study. As lower perceived social support may be considered a factor that potentially reflects minority stress or its consequences, other predictors defining minority stressors, such as internalized homonegativity, may have encapsulated the effect of perceived social support.

Chemsex Engagement Predicting CSBD

In our study, the frequency of sexualized drug use was positively moderately related to CSBD severity (evidence for H3), but an association with PPU was not supported (no evidence for H4). The available data on chemsex and its relation to CSBD is very scarce; however, we came across a qualitative study that showed chemsex may be used as a means of overcoming problems with intimacy and internalized homophobia (Van Hout et al., 2019). In addition, in the referenced study, participants recognized the addictive potential of sexualized drug use and its increasing compulsive character over the course of time reflected by the inability to withdraw from those behaviors, which is in line with the results of the current study. In another study, transcranial direct current stimulation reduced CSBs and craving for drugs, as well as completely diminished craving for chemsex (defined as addiction); however, these results were limited to one case report (Malandain et al., 2020). Although the discussed findings are scarce, the studies corroborate the presence of significant relationships between CSB and chemsex and may indicate common underpinnings of both behavioral patterns which can also be reflected in the level of brain functioning. Other research showed that polydrug use did not positively predict sexual compulsivity and the opposite relationship was not significant among gay and bisexual men, although here drug use was not measured specifically in a sexual context (Parsons et al., 2012). Moreover, some studies showed that MSM who engaged in sexualized drug use had closer ties to their sexual minority group (Graf et al., 2018; Pollard et al., 2018; Rosińska et al., 2018). In our study, however, chemsex did not correlate with social support. Because of these complex relationships, the relationship of chemsex to social support and CSBD as well as its role as a protective or risk factor for CSBD needs to be explored and disentangled in further longitudinal studies.

Other Predictors of CSBD and PPU

With increasing age participants showed less severe symptoms of CSBD and PPU which is consistent with the results of previous studies (Grubbs et al., 2019; Lewczuk, Wizła, Glica, et al., 2022; Lewczuk, Wizła, & Gola, 2022). The frequency of solitary or dyadic sexual activities was not related to CSBD and PPU, which is consistent with conclusions of previous studies showing that high sexual drive (Carvalho et al., 2015) or the high frequency of sexual behaviors (Bőthe, Tóth-Király et al., 2020) cannot be unequivocally identified with problematic sexual behaviors. However, this is inconsistent with studies showing that frequency of pornography use is a significant statistical predictor of PPU (e.g., Grubbs et al., 2019; Lewczuk, Wizła, Glica, et al., 2022; Lewczuk, Wizła, & Gola, 2022). In our study we noted significant, positive bivariate correlations between the frequency of pornography use and CSBD and PPU; however, this relationship lost significance as

other statistical predictors were introduced into the model. Overall, our results support the notion that, depending on other factors, the frequency of sexual activity is related to PPU and CSBD, although the strength of this relationship is limited (Bőthe, Tóth-Király et al., 2020). Next, none of the sexual minority orientations was associated with higher CSBD or PPU symptom severity. This may be counterintuitive to previous research showing that e.g., bisexual individuals experience double stigmatization and higher distress (Feinstein & Dyar, 2017; Pakula et al., 2016) and therefore poorer mental health (see: Ross et al., 2018). However, we had a limited number of participants in each orientation category, so we could not evaluate this proposition with high statistical power. Also, in previous studies, individuals representing emerging sexual orientation categories (e.g., pansexual, demisexual, asexual, queer) compared to homosexual individuals displayed a higher severity of anxiety and depression (Borgogna et al., 2019).

Occurrence of CSBD and PPU

We also calculated the occurrence rates of high risk for CSBD and PPU; however, resulting indices need to be treated with caution due to the sample's shortcomings (convenience sampling, small sample, size, etc.). In the current study, 8.6% of individuals were identified to be at high risk for CSBD compared to our previous studies on the Polish population with the following estimates – 6.71% (convenience sample; Wizła et al., 2022) and 4.7% (representative sample; Lewczuk, Wizła, Glica, et al., 2022). Regarding the group at high risk for PPU the estimate was 22.2%, while our previous studies showed a prevalence of 22.9% (convenience sample; Wizła et al., 2022), 17.8% (representative sample; Lewczuk, Wizła, & Gola, 2022), and 22.8% (representative sample; Lewczuk, Wizła, Glica, et al., 2022). Although no firm conclusions should be drawn based on these data, it seems to lend at least partial support to other research showing a slightly higher prevalence of CSBD in sexual minority groups (Dickenson et al., 2018), while we observed fewer differences with respect to PPU. At the same time, significantly more men than women participated in our study, and masculine gender was predictive of problematic sexual behaviors in previous studies (see: Kowalewska et al., 2020, 2022). However, in our regression analysis, gender was not significantly related to CSBD or PPU, which may also possibly be a pattern present in the LGBT+ group, compared to heterosexual individuals – this proposition should also be investigated in further studies. It should also be further emphasized that the BPS was developed as a screener and thus is intended to identify all potential cases with PPU, which also potentially results in an overestimation of PPU occurrence rates (e.g., possible inclusion of many participants who would not be diagnosed with PPU by a clinician, i.e., false positives).

Implications

The current study has both theoretical and clinical implications for further advancement in CSBD research, assessment, and therapy. However, they need to be considered with caution due to the study's cross-sectional design. It is hypothesized that distress associated with minority stress can be actually mistaken for CSBD (Jennings et al., 2022), and thus minority stress should be assessed when diagnosing CSBD. Our study pushes forward the discussion about the role of minority stressors in CSBD assessment for sexually diverse individuals. Our results showed the significant relationship, albeit of low effect size, between minority stressors and CSBs, highlighting the need for further exploration of specific factors, as well as underlying mechanisms. For example, for substance use, the model of health disparity claims that discrimination's relationship to substance use is mediated by automatic thoughts, as well as intermediate and core beliefs (Burgess et al., 2007; Hatzenbuehler, 2009). These underlying cognitive processes in turn can be targeted in, e.g., cognitive behavioral psychotherapy. Despite the vulnerability of this group to the development of CSBs, knowledge about etiological mechanisms unique to sexual minority individuals is scarce (Pachankis et al., 2015). For example, the fact that most studies on CSBD have assessed Christian, heterosexual, white cisgender men puts into question the generalizability of the exclusion criterion of moral incongruence when assessing CSBD (Jennings et al., 2021). In line with the ICD-11′s conceptualization of CSBD, this exclusion criterion posits that an individual cannot be diagnosed with CSBD if distress associated with sexual activity is attributed solely to their moral disapproval of those behaviors (World Health Organization, 2023). The role of minority stressors, as well as other factors specific to sexual minority groups, should be explored to design well-suited interventions, targeting those specific factors. Importantly, as chemsex engagement has been shown to positively relate to CSBD severity and the association was moderate in strength in the current study, chemsex assessment in the diagnostic process for CSBD among sexual minorities seems to be merited.

Limitations

The study was based on a cross-sectional design, which should be considered a drawback, as the possible influence between variables was investigated. Future studies should investigate the relationships between minority stress dimensions, social support, and chemsex engagement, on one hand, and PPU/CSBD, on the other hand, employing a longitudinal design. Such a design should allow for a more in-depth exploration of the relations between the analyzed variables, as a reverse influence is also possible, i.e., CSBs may lead to lower perceived social support. For example, longitudinal studies showed decreased marital bond quality in couples in which males used pornography (Perry, 2017). Pornography use was related to reported lower levels of commitment; this led to increased infidelity (Lambert et al., 2012), relationship instability, and the probability of breakup (Perry & Davis, 2017).

The current study materials and general aim and methodology were preregistered; however, the exact analysis steps and analytic design were not. Future studies (including future replication work) would benefit from preregistering all parts of the investigation (including the exact analysis plan and hypotheses). The current analysis was based on 198 participants and future studies should be based on even bigger samples to increase the statistical power of the design. As the obtained relationships between the main

variables of interest (minority stress factors, social support, PPU and CSBD) were of a small effect size, more participants are needed to reliably detect them. Future studies would benefit from employing bigger samples to achieve higher statistical power in investigating these relationships. Next, the current study did not offer a direct comparison between sexual minority participants and heterosexual individuals. This should be supplemented in future research, which could involve both these groups and allow for between-group comparisons. We also see possible improvements in the assessment of disclosure of sexual orientation. Future studies should incorporate versions of the *Outness Inventory* including items regarding disclosure to other members of minority communities (Allen, 2017), as well as measures distinguishing disclosure from concealment (e.g., *Nebraska Outness Scale*; Meidlinger & Hope, 2014). Another minor drawback was the lack of a unified answer scale for frequencies of various sexual behaviors (due to a coding error): from 1 to 7 for masturbation, sexual intercourse, and sexualized drug use, and from 1 to 8 for pornography use (see *Measures* section). This difference is not of great importance to the aims of our study that did not include the comparison of the various behavior frequencies. However, the lack of symmetry of scale for the frequency of porn consumption might have led to biased responses resulting from the participants' possible tendency to choose answers from either side of the scale. Also, future studies should include a more detailed assessment of social support as its associations with minority stress and mental health can differ depending on many factors, e.g., whether the support is on an individual or group level, whether it is sex-specific or unspecific (Doty et al., 2010; Frost et al., 2016; Verrelli et al., 2019). The level of support that sexually diverse individuals experience presumably varies greatly depending on the type of support; hence the small effect size in our study using a measure of perceived general support. As multiple dimensions of minority stress have been proposed and evaluated, other measures evaluating this construct can be used. Similarly, many other factors associated with CSBD and PPU have been identified, and although a single study cannot employ all important predictors, we would like to acknowledge that other variables (including onsets of sexual activity, dating apps use for sexual encounters, and others) could be potentially relevant. Our study was only based on Polish participants, which can be considered a limitation, taking into account the fact that sexuality has been found to be related to various culture-specific factors (e.g., Agocha et al., 2013). Future studies should be based on large cross-cultural samples to see if our results replicate in different cultural contexts, especially taking into account the differences in how LGBT+ community members are treated as this can result in different severity and frequency of minority stress experiences (Kaufman et al., 2017). Future research should also focus on gender minority individuals, which would complement current findings based on sexual minority participants. Next, our analysis regarding chemsex was based on relatively few participants who reported engaging in this behavior (the distribution of the answers being highly skewed, 91.0% of participants reported no chemsex engagement in the past year); thus, the results should be interpreted with caution. Lastly, the present research was conducted during the Covid-19 pandemic, and although findings regarding the impact of the pandemic on CSBD and PPU have been mixed (Bőthe et al., 2022; Grubbs et al., 2022; Koós et al., 2022; Xiong et al., 2020), future research should replicate current findings outside of this context.

Conclusions

Summing up, the current study provides insights into associations between perceived social support, minority stress, sexualized drug use, and CSBD and PPU symptom severity in a group of sexually diverse individuals. More severe CSBD symptoms were associated with lower social support, and with more frequent sexualized drug use, and experiences of heterosexist discrimination. More severe PPU symptoms were, on the other hand, related to higher internalized sexual stigma. Future studies should employ a longitudinal design to infer causal relationships between the variables. Presumably, general social support can, at least to a degree, potentially protect against the development of problematic sexual behavior symptoms, while minority stressors, as well as sexualized drug use, may act as risk factors for CSBs. Further studies are needed to disentangle these relationships, as well as identify other factors that may be specific to sexual minorities to advance the debate on the assessment of CSBD, and its most prevalent behavioral presentation – PPU, in this group, as well as to design better-targeted treatment interventions.

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The relation of perceived social support to compulsive sexual behavior

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ABSTRACT

We conducted two studies to investigate the links between perceived social support, problematic pornography use (PPU) and compulsive sexual behavior disorder (CSBD). In Study 1 (n=807, convenience sample recruited via social media) we collected preliminary data and in Study 2 (n=1526) we checked whether the results replicate in a sample representative of the Polish adult population. In both studies participants completed the Brief Pornography Screen, Compulsive Sexual Behavior Disorder Scale and Multidimensional Scale of Perceived Social Support. In Study 1 and 2, general social support was a weak protective factor against CSBD ($\beta = -0.15$ and $\beta = -0.10$) and PPU ($\beta = -0.12$ and $\beta = -0.09$ respectively, all p values $\leq .001$) adjusting for gender, age, sexual orientation and relationship status. The results for three domains of social support (from friends, significant other and family), however, largely differed between the two studies. In Study 1, perceived friends' support weakly protected against PPU and CSBD symptoms. In Study 2 higher support from friends weakly predicted lower CSBD symptoms among men; and stronger family support predicted lower PPU. Support from a significant other was weakly related to lower CSBD for women in Study 1. The conducted studies provided evidence that perceived social support is a protective factor against problematic sexual behavior; however, its predictive power is limited and further studies are needed to assess the importance of various domains of social support in the development of CSBD and PPU symptoms.

1. Introduction

Previous research has shown that factors like the strength of social bonds and social support that a person receives (or perceives) can have a significant influence on sexual behavior (e.g., Albert, 2010; Markham et al., 2010; Mesch, 2009; Peter and Valkenburg, 2011). Researchers focusing on compulsive sexual behavior (CSB) and problematic pornography use hypothesized that social support or strength of social bonds can be a crucial factor for the development of these phenomena. For example, some researchers see CSB and related behavioral patterns as primarily an 'intimacy disorder that is rooted in impaired early attachment experiences, for which the inability to form and maintain close personal relationships is a central feature' (Adams and Robinson, 2001, p. 232).

However, (1) there is only a limited amount of research that directly investigates the evidence for and against this claim and (2) there are prominent competing conceptions of the discussed phenomena, that recognize other factors (including the addictive potential of pornography which reflects the assumption that engagement in certain behaviors, similarly to taking psychoactive substances, may have a gratifying nature and therefore cause a strong tendency for repeated engagement [Kraus et al., 2016]) as the key for the development of compulsive sexual behavior disorder and place social support as a secondary factor or ignore it altogether. The main aim of the studies that we conducted was to fill this gap in the research and to provide evidence for the relation of social support to compulsive sexual behavior. First, we aimed at collecting preliminary data, and in the second study, we wanted to see if the findings replicate in a sample representative of the Polish adult population.

1.1. Social support, CSBD and PPU

Recently, researchers studying problematic sexual behavior have turned to compulsive sexual behavior disorder (CSBD), introduced in

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International Classification of Diseases, 11th edition (ICD-11 [World Health Organization, 2020) and problematic pornography use (PPU), which can be considered the most prevalent subtype and behavioral pattern of CSBD (de Alarcón et al., 2019; Kraus et al., 2020). Namely, PPU is most often conceptualized as preoccupation with pornography use causing significant distress and negative consequences as well as using pornography as a coping strategy (Lewczuk et al., 2020; Sniewski and Farvid, 2020). CSBD extends beyond pornography use and is characterized by an inability to control sexual impulses, thoughts and behaviors to the point it causes distress and impairs functioning in other areas of life. The individuals displaying CSBD symptoms fail to limit or refrain from sexual activities despite deriving lower or no satisfaction from it (World Health Organization, 2020).

Only a few studies have investigated the links between CSB and the quality of social bonds (e.g., Starks et al., 2013; Turner, 2009). Sexual compulsivity correlated positively with impaired social skills and loneliness (Muench and Parsons, 2004). Adverse family backgrounds and loneliness predicted higher CSBs (Dhuffar et al., 2015a) while a current stable sexual relationship was a protective factor against CSB (Långström and Hanson, 2006). The safety and quality of homosexual men's relationships' were affected by sexual compulsivity and characterized by diminished sexual communication and sexual satisfaction (Starks et al., 2013). CSB may be provoked by anxiety coping mechanisms and not sexual desires; people might engage in compulsive sex to diminish the feeling of anxiety that may be caused by loneliness (Coleman, 1992; Gola and Potenza, 2016). On a similar note, some researchers depict CSB as an attachment disorder (Flores, 2004), in which due to attachment disturbances occurring primarily in childhood, a person may be unable to form secure social connections later in life, and be at a higher risk of developing CSB (Gilliland et al., 2015; Riemersma and Sytsma, 2013; Zapf et al., 2008).

1.2. Social support and sexual behaviors

The influence of social bonds on the domain of sexuality has been most often investigated in the context of the preventive role of social bonds against sexual risk behaviors, for example, drug use before or during sex (Kecojevic et al., 2019). Research on this topic is, however, mainly limited to the adolescent population and indicates parents' significant influence on the sexual decisions of their children (Albert, 2010). Other research linking social support to risky sexual behavior showed that greater family, partner and school connectedness predicted better sexual health outcomes for adolescents (Markham et al., 2010). The bond with parents and intact family structure predicted fewer sexual risk behaviors (e.g., Boislard and Poulin, 2011; Trejos-Castillo and Vazsonyi, 2009; Usher-Seriki et al., 2008), and a good relationship with a same-sex parent was related to lower severity of CSB among teenagers (Efrati and Gola, 2019), while a high proportion of opposite-sex friends and substance abuse predicted earlier onset of sexual intercourse (Boislard and Poulin, 2011). The abovementioned research shows a clear link between the quality and type of social bonds and risky sexual behaviors; the most consistent results regard parents' protective role.

There is also a wide body of research on social connectedness and the use of sexually explicit material among the underaged. Pornography use was positively predicted by loneliness (relation moderated by attachment anxiety) (Efrati and Amichai-Hamburger, 2019a) and was linked to less commitment to family (Mesch, 2009). On the other hand, some studies show that relationship status or attachment to friends did not predict pornography use among adolescents nor adults (Peter and Valkenburg, 2011). Pornography users reported the same or even higher closeness levels to significant adults in their lives as non-users (Popović, 2011a, 2011b).

The associations of pornography use with relationship quality have also been extensively studied yielding ambiguous results (see: Vaillancourt-Morel et al., 2019a). The complexity of the associations between pornography use and sexual satisfaction might be explained by the moderating role of motives of use (see: Grubbs et al., 2019b).

1.3. Present studies

The studies reviewed above clearly show that social connectedness and support are important factors to consider when studying sexual behavior patterns, and may potentially have an important influence on the development of problematic forms of sexual behavior, like CSBD and PPU. However, hitherto, only a few studies investigated this subject. To address this blind spot in the available research, we designed two studies aimed at: (1) investigation of how general perceived social support relates to CSBD and PPU symptom severity; (2) exploration of how specific types of perceived social support (from family, friends and a significant other) are related to problematic sexual behavior; (3) investigation of how social support contributes to PPU and CSBD symptoms depending on the participant's gender. This is crucial, as previous studies have shown that problematic sexual behavior in its prevalence and characteristics, as well as the impact of social support on said behavior, can differ between men and women. Previous research has shown that compulsive sexual behavior severity, factors predicting PPU and CSBD, as well as the strength of predictors may differ between men and women (see: Kowalewska et al., 2020, 2022). Also, members of sexual minority groups were found to be at a higher risk of developing CSBD; also the involvement of factors specific to those groups, such as minority stress, in the development of CSBD has been hypothesized (Bőthe et al., 2018; Pachankis et al., 2015, 2022; Paz et al., 2019). Moreover, age was found to be associated with CSBD and PPU (e.g., Grubbs et al., 2019; Lewczuk et al., 2022b; Lewczuk et al., 2022c). Therefore, we decided to adjust for gender, sexual orientation, and age in our models.

In Study 1 we aimed to collect preliminary data pertaining to the aims of the study from a convenience sample recruited via social media. In Study 2, we aimed to replicate the obtained results in a sample representative of the national population.

2. Study 1

2.1. Method

2.1.1. Procedure and sample

The data was collected online from the participants recruited via social media predominantly in groups dedicated to sexuality and sexual health (n = 807, M_{age} = 21.92, SD = 5.64). The resulting sample consisted of 305 men (M_{age} = 24.32, SD = 7.77) and 502 women (M_{age} = 20.40, SD = 2.84). The resulting sample consisted of 807 participants out of 1386 who started the survey (i.e., clicked the survey link). We included in the analysis all the participants who completed the surveys relevant to the study (described in the *Measures* section below). As variable sexual orientation was dichotomized (0 – heterosexual, 1 – sexually diverse) and put as a predictor to regression analysis, we excluded from the analysis 22 participants who chose the answer "other" to the question about sexual orientation. No other exclusion criteria were adopted.

Regarding sexual orientation, 62.45% of participants (n=504) identified themselves as heterosexual, 8.92% (n=72) as homosexual, 23.2% (n=187) as bisexual, 1.23% (n=10) as asexual, 4.21% (n=34) as pansexual. The majority of the participants (n=528; 65.42%) were in a relationship (formal [married] or informal) and 34.57% (n=279) were single.

2.1.2. Measures

Problematic pornography use was assessed with the 5-item (α = 0.84) Brief Pornography Screen (Kraus et al., 2020). The answer scale for each item was: 0 (*Never*), 1 (*Sometimes*), and 2 (*Frequently*) and the general score, used in our analyses, was obtained from the sum of items.

Compulsive sexual behavior disorder symptom severity was measured with the Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bőthe

et al., 2020). The tool entails 19 items ($\alpha = 0.89$) with answers ranging from 1 (*Completely disagree*) to 4 (*Completely agree*).

Perceived social support was measured with the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). The tool consists of 12 items ($\alpha = 0.89$) with an answer scale from 1 (*Completely disagree*) to 7 (*Completely agree*). The measure assesses support on three scales (4 items each) – perceived support from family ($\alpha = 0.92$), friends ($\alpha = 0.95$), and significant other ($\alpha = 0.91$). The value for the general score, as well as for the particular subscales, was derived from the sum of corresponding items.

We also adjusted for participants' *age, gender, sexual orientation* (coded dichotomously: 0 – heterosexual, 1 – sexually diverse) and *relationship status* (0 – single, 1 – in a relationship, both formal [married] or informal).

2.1.3. Ethics

The Study 1 and Study 2 procedures were carried out according to the Declaration of Helsinki. The Institutional Review Board of the Cardinal Stefan Wyszyński University in Warsaw approved the study. All subjects were informed about the study and provided informed consent.

2.1.4. Statistical analysis

In the first step, we analyzed bivariate correlations between all analyzed variables (presented in Supplementary material) and descriptive statistics. We also report the estimated prevalence rates of CSBD and PPU based on the cutoff criteria of questionnaires. The rates are given, however, only for comparison's sake, and we refrain from discussing them in the current work, as they are discussed in another manuscript based on the same dataset, but including analyses of different variables (see: Lewczuk et al., 2022). We decided to make intergroup comparisons using a non-parametric Whitney-Mann *U* test (due to slightly elevated skewness and kurtosis values, in comparison to standard error; Table 1). Effect size *r* was calculated with the values less than 0.3 indicating small effect, between 0.3 and 0.5 – medium effect, and greater than 0.5 – large effect. Next, we conducted linear regression analyses in which the severity of CSBD and PPU symptoms were predicted variables. We placed perceived social support, gender, age, sexual orientation and relationships status as controlled variables. We provided the standardized regression coefficients and 95% confidence intervals, as well as *p*-values for the effects. We used the Statistical Package for the Social Sciences (SPSS, IBM Corp., v.27, 2020) to perform all statistical analyses.

2.1.5. Linear regression assumptions

We inspected our data for possible outliers, normality, collinearity, and homoscedasticity. We analyzed skewness and kurtosis values (Table 1) that were found to be slightly elevated. We analyzed the potential outliers, based on the standardized values of error (using as cut off value |3.29|; Tabachnick et al., 2007).[1] We found a few outliers in both studies, however taking into account the size and character of the samples, we decided not to exclude any participants assuming that they might reflect the actual variance of the sample. The inspection of the normality plots of predicted values and residual values yielded possible aberrations; thus, we conducted a Breusch–Pagan test to check the

[1] ***Study 1*** Model predicting CSBD severity: case number: 1212 [standardized predictederror value: 4.46], 1166 [4.18], 258 [3.49], 827 [3.33]; model predicting PPUseverity: 843 [3.69], 417 [3.56], 614 [3.41], 307 [3.38].***Study 2*** Model predicting CSBD severity: 716 [4.70], 1253 [4.58030], 1298 [3.82], 841 [3.77], 493 [3.63], 1255 [3.54], 692 [3.47]; model predicting PPU severity: 479 [3.67], 1253 [3.59], 684 [3.58], 679 [3.55], 1299 [3.52], 757 [3.40], 716 [3.38], 1249 [3.34], 1125 [3.32], 1250 [3.31], 481 [3.31].Case numbers correspond to our open datasets [https://osf.io/nu4vt/; https://osf.io/g6mz9]. Values given here are derived from models based on all participants including the perceived social support general score.

Table 1
Descriptive statistics and gender comparisons (using the Mann-Whitney *U* test as indicated by the standardized test statistics *z*) for analyzed variables (Study 1).

	Range	All				Men				Women				*z*	*r*
		M (*SD*)	Mdn	Skewness (SE = .09)	Kurtosis (SE = .17)	*M* (*SD*)	Mdn	Skewness (SE = .14)	Kurtosis (SE = .28)	*M* (*SD*)	Mdn	Skewness (SE = .11)	Kurtosis (SE = .22)		
MSPSS General Score	12.00–84.00	62.11 (14.15)	64.00	−.84	.57	58.63 (14.91)	60.00	−.69	.16	64.23 (13.25)	66.00	−.91	.92	−5.37*	.19
MSPSS Family	4.00–28.00	17.22 (7.04)	18.00	−.27	−1.06	16.87 (6.92)	17.00	−.19	−1.09	17.43 (7.11)	18.00	−.32	−1.03	−1.20	.04
MSPSS Friends	4.00–28.00	22.01 (6.06)	24.00	−1.22	.89	20.62 (6.39)	22.00	−.93	.20	22.85 (5.68)	24.00	−1.45	1.67	−5.60*	.20
MSPSS Significant Other	4.00–28.00	22.88 (6.03)	25.00	−1.38	1.21	21.14 (6.76)	24.00	−.95	−.03	23.94 (5.27)	26.00	−1.71	2.63	−6.19*	.22
CSBD symptoms (CSBD-19 General Score)	19.00–76.00	33.51 (9.70)	32.00	.90	1.02	35.31 (10.26)	34.00	.82	1.00	32.42 (9.18)	31.00	.92	.95	4.06*	.14
PPU symptoms (BPS General Score)	0.00–10.00	2.12 (2.51)	1.00	1.30	.92	3.28 (2.76)	3.00	.69	−.43	1.41 (2.05)	1.00	1.89	3.52	10.84*	.38

*$p < .001$.
Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.

homoscedasticity of our sample and found that the assumption of homogeneity of residuals variance was not met for our models. We also analyzed the variance inflation factor, with values below 2 in Study 1 and below 3 in Study 2 indicating an acceptable level of multicollinearity (Becker et al., 2015).

2.2. Results

2.2.1. Descriptive analysis and gender comparisons

Problematic sexual behavior. Men (M=35.31, SD = 10.26) showed more severe symptoms of CSBD ($Z = 4.06$, $p < .001$, $r = 0.14$; based on CSBD-19) than women (M=32.42, SD = 9.18). Based on a cut-off score of ≥50 (Bőthe et al., 2020), 6.69% of participants (n=54 out of n=807) were estimated to be at high risk of CSBD. The risk was higher among men (n=27 out of n=305 men; 8.85%) than women (n=27 out of n=502 women; 5.38%). Men (M=3.28, SD = 2.76) also scored higher in BPS ($Z = 10.84$, $p < .001$, $r = 0.38$) than women (M=1.41, SD = 2.05) (Table 1). Prevalence of PPU (cut-off score ≥4; Kraus et al., 2020) was estimated at 23.17% (n=187 out of n=807), and was higher among men 40.66% (n=123 out of n=305 men) than women 12.55% (n=63 out of n=502 women).

Perceived Social Support. Women (M=64.23, SD = 13.25) reported higher levels of perceived social support ($Z = -5.37$, $p < .001$, $r = 0.19$) than men (M=58.63, SD = 14.91). When comparing support in three different domains, women claimed to receive greater support from friends ($M_{women} = 22.85$, $SD = 5.68$; $M_{men} = 20.62$, $SD = 6.39$; $Z = -5.60$, $p < .001$, $r = 0.20$) and a significant other ($M_{women} = 23.94$, $SD = 5.27$; $M_{men} = 21.14$, $SD = 6.76$; $Z = -6.19$, $p < .001$, $r = 0.22$) than men. There were no significant differences between men and women in the perceived amount of support received from family.

2.2.2. Perceived social support predicting problematic sexual behavior

Next, we conducted regression analyses in which the severity of CSBD and PPU symptoms were predicted variables. We placed perceived social support, gender, age, sexual orientation and relationships status as predictors (Table 2). Perceived social support predicted lower severity of CSBD symptoms ($\beta = -0.15$, $p < .001$), but the relationship was significant only among women ($\beta = -0.18$, $p < .001$), but not men ($\beta = -0.08$, $p = .182$). Perceived social support was a protective factor against PPU ($\beta = -0.12$, $p < .001$), but also only for women ($\beta = -0.16$, $p < .05$), and not for men ($\beta = -0.09$, $p = .147$).

We also created regression models, in which three types of perceived social support (perceived social support from family, friends and a significant other) predicted problematic sexual behavior. We also adjusted for sex, age, sexual orientation and relationship status (Table 3). Perceived social support from friends predicted lower severity of CSBD symptoms ($\beta = -.09$, $p < .05$) in the whole sample, but the relationship was insignificant when the models were constructed separately for men ($\beta = -.08$, $p = .237$) and women ($\beta = -0.09$, $p = .078$). Lower perceived support from friends ($\beta = -0.17$, $p < .001$) predicted higher PPU both for men ($\beta = -0.23$, $p < .001$) and women ($\beta = -0.12$, $p < .05$). Also, greater perceived social support from a significant other was a protective factor against CSBD symptom severity for women ($\beta = -0.13$, $p < .05$).

2.2.3. Other predictors of problematic sexual behavior

Masculine gender was predictive of higher CSBD ($\beta = 0.14$, $p < .001$) and PPU ($\beta = 0.37$, $p < .001$) symptom severity. Higher age predicted lower PPU symptom severity ($\beta = -0.11$, $p < .05$), however the relation remained significant only for men ($\beta = -0.15$, $p < .05$). Neither relationship status nor sexual orientation predicted any problematic sexual behaviors(Table 3).

The comparison of the standardized regression indices (with 95% CI's) between men and women showed no differences for any of the predictors.

3. Study 2

3.1. Method

3.1.1. Procedure and sample

The study was conducted online via the Pollster research platform (https://pollster.pl/). The data was collected from a sample of 1526 participants (M_{age} = 43.02, SD = 14.37) – representative of the Polish adult population in terms of gender, age group, education, size of the place of residence and the region of residence. The group consisted of 779 women ($M_{age} = 42.08$, $SD = 14.14$) and 747 men ($M_{age} = 44.00$, SD = 14.55). The norms provided by Statistics Poland (2018 norms for gender and age group and 2017 for education, country region, size of the place of residence) ensured the representativeness of the sample. The external data provider delivered a dataset including participants who completed all the questionnaires relevant to the study. We have no information on how many participants started but did not finish the study. The sample is representative in terms of formal sociodemographic characteristics, however, there might be an overrepresentation of people who are more willing to participate in psychological surveys, especially on sexuality. Similarly to Study 1, we excluded 15 participants who chose the answer "other" to the question about sexual orientation.

Regarding sexual orientation, 91.22% of participants (n=1392) identified themselves as heterosexual, 3.87% (n=59) as homosexual,

Table 2
Results of multivariable linear regression: general perceived social support predicting compulsive sexual behavior disorder (measured by the CSBD-19 Scale) and problematic pornography use (measured by the BPS scale) symptoms in the whole sample, as well as for men and women separately (Study 1, analysis 1).

	CSBD-19 General Score						BPS General Score					
	All		Men		Women		All		Men		Women	
	β [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*	*B* [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*
MSPSS General Score	**−.15 [-.21, -.08]**	**<.001**	−.08 [-.20, .04]	.182	**−.18 [-.28, -.10]**	**<.001**	**−.12 [-.18, -.05]**	**<.001**	−.09 [-.20, .03]	.147	**−.16 [-.25, -.07]**	**.001**
Gender	**.14 [.06, .21]**	**<.001**	———		———		**.38 [.31, .45]**	**<.001**	———		———	
Age	−.05 [-.12, .02]	.190	−.04 [-.15, .07]	.490	−.05 [-.14, .04]	.247	**−.09 [-.16, -.02]**	**.008**	**−.13 [-.24, -.01]**	**.029**	−.05 [-.14, .04]	.263
Sexual orientation	.01 [-.06, .07]	.874	−.07 [-.18, .04]	.226	.05 [-.04, .13]	.272	.01 [-.06, .07]	.841	−.07 [-.18, .04]	.225	.07 [-.02, .16]	.115
Relationship Status	.03 [-.04, .11]	.355	−.00 [-.12, .12]	.981	.05 [-.04, .14]	.293	.02 [-.05, .09]	.523	.08 [-.03, .20]	.166	−.04 [-.13, .05]	.397
F	**7.31 (<.001)**		.95 (.417)		**5.60 (<.001)**		**28.60 (<.001)**		2.38 (.068)		**5.13 (<.001)**	
R^2_{adj}	**.038**		.000		**.035**		**.146**		.016		**.032**	

Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.
Gender (0 – feminine, 1 – masculine); Sexual orientation (0 – heterosexual, 1 – sexually diverse); Relationship status (0 – not in a relationship; 1 – in a relationship).

Table 3
Results of multivariable linear regression: subdimensions of perceived social support predicting compulsive sexual behavior disorder measured by the CSBD-19 Scale) and problematic pornography use (measured by the BPS scale) symptoms in the whole sample, as well as for men and women separately (Study 1, analysis 2).

	CSBD-19 General Score						BPS General Score					
	All		Men		Women		All		Men		Women	
	β [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*	*B* [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*
MSPSS Family	−.03 [-.10, .04]	.434	.01 [-.12, .13]	.904	−.05 [-.15, .05]	.272	.01 [-.06, .08]	.763	.05 [-.07, .17]	.429	−.03 [-.12, .06]	.528
MSPSS Friends	**−.09 [-.17, -.02]**	**.019**	−.08 [-.21, .05]	.237	−.09 [-.19, .01]	.078	**−.17 [-.25, -.10]**	**<.001**	**−.23 [-.36, -.11]**	**<.001**	**−.12 [-.22, -.02]**	**.016**
MSPSS Significant Other	−.08 [-.18, .01]	.074	−.04 [-.19, .12]	.643	**−.13 [-.24, -.02]**	**.023**	.01 [-.07, .10]	.764	.07 [-.08, .23]	.342	−.06 [-.17, .05]	.271
Gender	**.14 [.06, .21]**	**<.001**	–		–		**.37 [.30, .44]**	**<.001**	–		–	
Age	−.06 [-.13, .02]	.127	−.05 [-.17, .07]	.403	−.06 [-.15, .03]	.175	**−.11 [-.17, -.04]**	**.003**	**−.15 [-.26, -.03]**	**.012**	**−.06 [-.15, .03]**	.197
Sexual orientation	.01 [-.06, .08]	.713	−.06 [-.17, .06]	.341	.05 [-.03, .14]	.229	.02 [-.04, .09]	.496	−.03 [-.14, .09]	.619	.08 [-.01, .16]	.089
Relationship Status	.04 [-.04, .12]	.348	−.00 [-.15, .14]	.955	.07 [-.03, .17]	.174	−.02 [-.09, .06]	.672	.01 [-.13, .15]	.907	−.04 [-.14, .06]	.424
F	**5.50 (<.001)**		.79 (.575)		**4.02 (<.001)**		**22.65 (<.001)**		**3.33 (.003)**		**3.76 (.001)**	
R^2_{adj}	**.038**		−.004		**.032**		**.158**		**.044**		**.032**	

Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.
Gender (0 – feminine, 1 – masculine); Sexual orientation (0 – heterosexual, 1 – sexually diverse); Relationship status (0 – not in a relationship; 1 – in a relationship).

4.19% (*n*=64) as bisexual, and 0.72% (*n*=11) as asexual. The majority of the participants (*n*=1169; 76.61%) were in a formal [married] or informal relationship and 23.39% (*n*=357) were not in any kind of intimate relationship. Participants were asked to complete a set of online measures regarding their perceived social support and problematic sexual behavior.

3.1.2. Measures

To replicate our results on a representative sample of Polish citizens, in Study 2 we used the same set of measures as in Study 1:

- Brief Pornography Screen (α = 0.84; Kraus et al., 2020);
- Compulsive Sexual Behavior Disorder Scale (α = 0.93; Bőthe et al., 2020);
- Multidimensional Scale of Perceived Social Support (α = 0.93; Zimet et al., 1988) measuring support in three domains: family (*α* = 0.92), friends (*α* = 0.94), and significant other (*α* = 0.91).

Moreover, participants were asked to indicate their *age*, *gender* and *relationship status*. Answers regarding relationship status were coded into two categories: 0 (single) and 1 (formal [married]/informal relationship).

The analytic plan from Study 1 was repeated in Study 2 according the same ethical standards. Materials for this study were preregistered using the OSF platform and are available online: https://osf.io/5jd94.

We have also preregistered the general goal of the analysis as replicating the results of Study 1 pertaining to the relation of perceived social support to PPU and CSBD [https://osf.io/5jd94]. Data used in the presented analysis is also available using the link: https://osf.io/g6mz9. Other researchers are free to use the data to extend or replicate the analysis reported here. Results regarding the CSBD and PPU based on the current Study 2 were already reported in one other article (Lewczuk et al., 2022), but the mentioned article focuses on a different subject and does not contain any results regarding social support.

3.2. Results

As for Study 1, Correlations for Study 2 are reported in Supplementary Material.

3.2.1. Descriptive analysis and gender comparisons

Problematic sexual behavior. Men (*M*=34.66, *SD* = 9.78) tended to display more severe symptoms of CSBD ($Z = 7.77$, $p < .001$, $r = 0.20$; based on CSBD-19) than women (*M*=30.87, *SD* = 9.04) (Table 4). Based on the cut-off score proposed by Bőthe et al. (2020), a high risk for CSBD could be estimated for 4.65% of participants (*n*=71 out of *n*=1526), and was more prevalent among men, 6.16% (*n*=46 out of *n*=747 men), than women, 3.21% (*n*=25 out of *n*=779 women). Men (*M*=2.56, *SD* = 2.62) also scored higher on BPS ($Z = 12.74$, $p < .001$, $r = 0.33$) than women (*M*=1.10, *SD* = 1.86) (Table 4). Prevalence of PPU (cut-off score ≥4; Kraus et al., 2020) was estimated at 22.94% (*n*=350 out of *n*=1526), and was, similarly to CSBD, more common among men, 33.33% (*n*=249 out of *n*=747 men), than women, 12.97% (*n*=101 out of *n*=779 women). The results regarding the prevalence of problematic sexual behavior based on the sample from Study 2 were also reported in the recent article (Lewczuk et al., 2022), but we report it here for context and comparison's sake, however, we refrain from discussing the prevalence rates.

Perceived social support. Higher general scores in perceived social support ($Z = -3.74$, $p < .001$, $r = 0.10$) characterized women (*M*=63.50, *SD* = 14.15) compared to men (*M*=61.21, *SD* = 13.93). Women scored higher than men both in the domains of family ($M_{women} = 21.26$, $SD = 5.50$; $M_{men} = 20.75$, $SD = 5.24$; $Z = -2.64$, $p < .05$, $r = 0.07$) and friends ($M_{women} = 20.65$, $SD = 5.61$; $M_{men} = 19.33$, $SD = 5.38$; $Z = -5.78$, $p < .001$, $r = 0.15$). No differences between men and women were found in perceived support from the significant other ($M_{women} = 21.66$, $SD = 5.94$; $M_{men} = 21.14$, $SD = 5.98$) (Table 4).

3.2.2. Perceived social support predicting problematic sexual behavior

Perceived social support predicted less severe symptoms of CSBD ($\beta = -0.10$, $p < .001$), but it was a significant predictor only among men ($\beta = -0.17$, $p < .001$). Similar results were obtained for PPU: higher MSPSS general score proved to be a protective factor against the severity of PPU for the whole group ($\beta = -0.09$, $p < .001$), as well as for men ($\beta = -0.12$, $p < .05$) (Table 5).

Perceived social support from family predicted less severe symptoms of PPU ($\beta = -0.09$, $p < .05$) both among men ($\beta = -0.10$, $p < .05$), and women ($\beta = -0.12$, $p < .05$). Perceived social support from friends was a protective factor against CSBD symptoms among men ($\beta = -0.10$, $p < .05$). No other results regarding the impact of perceived social support were found to be significant (Table 6).

3.2.3. Other predictors of problematic sexual behavior

Masculine gender was predictive of greater CSBD ($\beta = 0.20$, $p < .001$) and PPU ($\beta = 0.31$, $p < .001$) symptom severity. Being in an

Table 4
Descriptive statistics and gender comparisons (using the Mann-Whitney *U* test as indicated by the standardized test statistics *z*) for analyzed variables (Study 2).

	Range	All				Men				Women				*z*	*r*
		M (*SD*)	Mdn	Skewness (SE = .06)	Kurtosis (SE = .13)	*M* (*SD*)	Mdn	Skewness (SE = .09)	Kurtosis (SE = .18)	*M* (*SD*)	Mdn	Skewness (SE = .09)	Kurtosis (SE = .18)		
MSPSS General Score	12.00–84.00	62.41 (14.08)	65.00	−.88	.74	61.21 (13.93)	64.00	−.86	.77	63.50 (14.15)	66.00	−.92	.77	−3.74**	.10
MSPSS Family	4.00–28.00	21.01 (5.38)	22.00	−1.00	.66	20.75 (5.24)	22.00	−.92	.46	21.26 (5.50)	23.00	−1.09	.87	−2.64*	.07
MSPSS Friends	4.00–28.00	20.00 (5.54)	21.00	−.84	.42	19.33 (5.38)	20.00	−.72	.37	20.65 (5.61)	22.00	−1.00	.65	−5.78**	.15
MSPSS Significant Other	4.00–28.00	21.40 (5.96)	23.00	−1.13	.73	21.14 (5.98)	23.00	−1.08	.61	21.66 (5.94)	23.00	−1.19	.87	−2.02	.05
CSBD symptoms (CSBD-19 General Score)	19.00–76.00	32.73 (9.59)	32.00	.61	.31	34.66 (9.78)	35.00	.51	.43	30.87 (9.04)	29.00	.72	.24	7.77**	.20
PPU symptoms (BPS General Score)	0.00–10.00	1.81 (2.38)	1.00	1.34	1.16	2.56 (2.62)	2.00	.91	.11	1.10 (1.86)	.00	1.91	3.35	12.74**	.33

*$p < .05$; **$p < .001$.
Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.

intimate relationship was found to be a risk factor for higher CSBD symptoms ($\beta = .10$, $p < .05$), but the relationship remained statistically significant only for men ($\beta = .13$, $p < .05$). In addition, being in a relationship protected against PPU symptom severity among women ($\beta = -.08$, $p < .05$). Increasing age was generally related to lower severity of problematic sexual behaviors (CSBD: $\beta = -0.09$, $p < .001$; PPU: $\beta = -0.12$, $p < .001$). Sexual diversity predicted higher symptom severity (CSBD: $\beta = 0.09$, $p < .05$; PPU: $\beta = 0.08$, $p < .001$) (Table 6).

The comparison of the standardized regression indices (with 95% CI's) between men and women showed no differences for any of the predictors.

4. Discussion

The main goal of the reported studies (Study 1 – convenience sample; Study 2 –sample representative of the Polish adult population) was to provide evidence regarding the relationship between social support and PPU symptom severity. This is important as (a) social support has been hypothesized (e.g., Långström and Hanson, 2006; Starks et al., 2013; Turner, 2009) as a potential factor in the development of CSBD/PPU, but only a limited amount of research has directly investigated this claim and (b) the possible importance of social support for CSBD/PPU would indicate that targeting it (and related variables, including social competence) during diagnosis and therapy would be beneficial. In our analyses, we adjusted for other potential predictors of problematic sexual behavior: sex, age, sexual orientation and relationship status. As previous studies showed initial evidence that social bonds can relate differently to sexual behavior for men compared to women (Grossman et al., 2014; Grubbs et al., 2019; Perry, 2017; Stewart and Szymanski, 2012; Werner-Wilson, 1998), we also investigated these differences in our models.

4.1. Relation of perceived social support to problematic sexual behavior

Our results showed that in Study 1 and Study 2, general perceived social support was a protective factor both against CSBD and PPU when the results for the whole sample are taken into account, however, the strength of all these associations was weak. When the analysis for men and women was conducted separately, in Study 1 lower general social support remained a significant predictor of CSBD and PPU only for women (n=502), but not for men (n=305). Gender-specific models for Study 2 showed that general perceived social support was a protective factor against PPU symptom severity both for men and women, but in the case of CSBD symptom severity only in the group of men. It is important to emphasize that despite differences in statistical significance for men and women, the 95% confidence intervals imply no differences in the relationships between the two groups. Also, the effect size of standardized linear regression coefficients is low which might explain why the predictor reached statistical significance for one gender, but not for the other.

The obtained relationships between social support and problematic sexual behavior symptoms are in line with other preliminary research showing that loneliness is a risk factor for CSB (Dhuffar et al., 2015a; Muench and Parsons, 2004), while stable social relationships might protect against it (Långström and Hanson, 2006).

However, our results are weak to moderate in strength and seem not to lend support to the notion that compulsive sexual behavior is caused primarily by an inability to form social connections (Adams and Robinson, 2001; Flores, 2004) but rather support its role as a secondary factor. Our results may be consistent with the notion, as well as clinical experience reported by some therapists, that factors related to attachment disorders, early childhood trauma and impaired ability to form intimate relationships were indeed a common cause for compulsive sexual behavior in the past but were replaced by other factors in this role [among which, the availability of free and instantaneous pornography associated with rapidly growing access to the Internet may be the

Table 5
Results of multivariable linear regression: general perceived social support predicting compulsive sexual behavior disorder (measured by the CSBD-19 Scale) and problematic pornography use (measured by the BPS scale) symptoms in the whole sample, as well as for men and women separately (Study 2, analysis 2).

	CSBD-19 General Score						BPS General Score					
	All		Men		Women		All		Men		Women	
	β [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*	*B* [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*
MSPSS General Score	**−.10 [-.15, -.05]**	**<.001**	**−.17 [-.25, -.09]**	**<.001**	−.04 [-.11, .04]	.326	**−.09 [-.14, -.04]**	**<.001**	**−.12 [-.20, -.04]**	**.004**	−.07 [-.15, .00]	.054
Gender	**.20 [.15, .25]**	**<.001**	–	–	**.31 [.26, .36]**	**<.001**	———	———				
Age	**−.09 [-.14, -.04]**	**<.001**	−.07 [-.14, .01]	.079	**−.13 [-.20, -.06]**	**<.001**	**−.13 [-.18, -.09]**	**<.001**	**−.16 [-.23, -.08]**	**<.001**	**−.15 [-.22, -.08]**	**<.001**
Sexual orientation	**.09 [.04, .14]**	**<.001**	**.10 [.03, .17]**	**.007**	.08 [.01, .15]	.021	**.09 [.04, .13]**	**<.001**	**.10 [.03, .17]**	**.005**	**.08 [.01, .15]**	**.019**
Relationship Status	**.11 [.06, .16]**	**<.001**	**.14 [.06, .22]**	**<.001**	**.08 [.01, .16]**	**.031**	.00 [-.05, .05]	.958	.07 [-.01, .15]	.106	−.07 [-.14, .00]	.059
F	**21.97 (<.001)**		**7.24 (<.001)**		**6.56 (<.001)**		**45.09 (<.001)**		**8.75 (<.001)**		**8.75 (<.001)**	
R^2_{adj}	**.064**		**.032**		**.028**		**.126**		**.038**		**.038**	

Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.
Gender (0 – feminine, 1 – masculine); Sexual orientation (0 – heterosexual, 1 – sexually diverse); Relationship status (0 – not in a relationship; 1 – in a relationship).

Table 6
Results of multivariable linear regression: subdimensions of perceived social support predicting compulsive sexual behavior disorder (measured by the CSBD-19 Scale) and problematic pornography use (measured by the BPS scale) symptoms in the whole sample, as well as for men and women separately (Study 2, analysis 2).

	CSBD-19 General Score						BPS General Score					
	All		Men		Women		All		Men		Women	
	β [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*	*B* [95% CI]	*p*	*β* [95% CI]	*p*	*β* [95% CI]	*p*
MSPSS Family	−.06 [-.12, .01]	.080	−.07 [-.16, .03]	.177	−.06 [-.15, .04]	.220	**−.09 [-.16, -.04]**	**.003**	**−.10 [-.19, .00]**	**.047**	**−.12 [-.21, -.03]**	**.010**
MSPSS Friends	−.05 [-.12, .01]	.085	**−.10 [-.19, -.01]**	**.027**	−.01 [-.10, .08]	.860	−.02 [-.08, .04]	.546	−.06 [-.14, .03]	.210	.02 [-.07, .11]	.655
MSPSS Significant Other	−.00 [-.08, .07]	.925	−.03 [-.14, .07]	.526	.03 [-.08, .13]	.598	.02 [-.05, .09]	.654	.02 [-.08, .13]	.683	.02 [-.08, .12]	.667
Gender	**.20 [.15, .25]**	**<.001**	–		–		**.31 [.26, .35]**	**<.001**	–		–	
Age	**−.09 [-.14, -.04]**	**<.001**	−.07 [-.14, .01]	.078	**−.12 [-.19, -.05]**	**.002**	**−.12 [-.17, -.07]**	**<.001**	**−.15 [-.23, -.07]**	**<.001**	**−.13 [-.20, -.06]**	**<.001**
Sexual orientation	**.09 [.04, .14]**	**.002**	**.10 [.03, .17]**	**.008**	**.08 [.01, .16]**	**.029**	**.08 [.03, .13]**	**<.001**	**.10 [.03, .17]**	**.007**	**.08 [.01, .15]**	**.032**
Relationship Status	**.10 [.04, .15]**	**.001**	**.13 [.04, .21]**	**.005**	.07 [-.01, .15]	.089	−.01 [-.07, .04]	.611	.05 [-.04, .14]	.266	**−.08 [-.16, .00]**	**.047**
F	**15.86 (<.001)**		**4.96 (<.001)**		**4.56 (<.001)**		**32.87 (<.001)**		**6.00 (<.001)**		**6.58 (<.001)**	
R^2_{adj}	**.064**		**.027**		**.034**		**.128**		**.039**		**.041**	

Note. MSPSS = the Multidimensional Scale of Perceived Social Support, CSBD-19 = the Compulsive Sexual Behavior Disorder Scale, BPS = the Brief Pornography Screen.
Gender (0 – feminine, 1 – masculine); Sexual orientation (0 – heterosexual, 1 – sexually diverse); Relationship status (0 – not in a relationship; 1 – in a relationship).

leading one (see: Hall, 2013; Lewczuk et al., 2022a)].

4.2. Relation of perceived family support to problematic sexual behavior

In Study 1 perceived social support from family did not predict problematic sexual behavior. The reason for this might be the age of participants – most of them were in their late teens and early twenties; family's influence on sexual decisions was strongest before entering the peer-oriented age, at around 15 years old (Kim et al., 2011). The results of Study 2 showed that this kind of social support was a weak protective factor against PPU symptom severity in the representative sample, for which the mean age was significantly higher. The importance of this predictor is in congruence with previous results indicating the potential impact of adverse family backgrounds in developing sexual problems (Dhuffar et al., 2015a; Efrati and Gola, 2019) and the significance of family involvement in therapy (e.g., Carnes, 2001; Hughes, 2010).

4.3. Relation of perceived friends' support to problematic sexual behavior

In Study 1, perceived social support from friends was a protective factor against PPU symptoms both for men and women. Support from friends was also a significant, however weak, and negative predictor of CSBD symptoms in the whole group. In Study 2 support from friends only statistically predicted lower CSBD symptom severity for men, however, the comparison of standardized coefficients with 95% CIs yielded no differences between men and women. The difference in the obtained results between Study 1 ($M_{age} = 21.92$, $SD = 5.64$) and Study 2 ($M_{age} = 43.02$, $SD = 14.37$) is in line with research showing that the significance of social support from friends diminishes with one's age (Prezza and Pacilli, 2002). The mean age of participants in Study 2 was decidedly higher than in Study 1, thus the relationship of perceptions of this kind of support with sexual behavior can also diminish.

4.4. Relation of perceived significant other's support to problematic sexual behavior

In Study 1, support from a significant other only weakly predicted lower CSBD symptom severity among women. In Study 2 no relationships were found to be significant. On average, women participating in Study 1 were much younger than women participating in Study 2 (Study

1: M_{age} = 20.42, Study 2: M_{age} = 42.08). Thus, a higher percentage of women in Study 1 might be in the early phases of a romantic relationship when the influence, also on shaping the sexual behavior, of the partner may be greater. The fact that the relationship was significant for women, but not men may be partly attributed to greater susceptibility of women's sexuality to situational and sociocultural factors (Baumeister, 2000), possibly also in the domain of problematic sexual behavior (Lewczuk et al., 2017). Also, the still existing double standard between men and women (see: Endendijk et al., 2020) predicted women's lower sexual assertiveness and greater malleability of their sexual behaviors by their partners (Cheng et al., 2014; Greene and Faulkner, 2005; Kiefer and Sanchez, 2007). However, this difference, with regards to our studies, should be interpreted with caution as when analyzing 95% CIs no differences between men and women were found.

4.5. Other predictors of CSBD and PPU

In line with previous research PPU and CSBD were more prevalent for men (e.g., Bőthe et al., 2020; Kraus et al., 2020).[2] However, importantly, the role of social support in predicting problematic sexual behavior is similar for both genders, underlining the role of social support as a secondary factor, which is merely weakly related to PPU and CSBD symptom severity. This is in contrast to research showing that social bonds can relate differently to sexual behavior for men compared to women (e.g., Grubbs et al., 2019; Perry, 2017; Stewart and Szymanski, 2012). However, it is important to note that these studies analyzed different indicators of social support: loneliness (e.g., Dhuffar et al., 2015b; Efrati and Amichai-Hamburger, 2019b; Torres and Gore-Felton, 2007a), or relationship quality (Starks et al., 2013; Stewart and Szymanski, 2012). In the discussion on social support's relation to sexual behavior, it is also essential to distinguish between problematic and normative forms of sexual behaviors (for example, for complex associations of pornography use with relationship quality, see, e.g., Vaillancourt-Morel et al., 2019b).

Similarly to the results of our previous study (Lewczuk et al., 2022), CSB symptom severity decreased with age. In Study 2, similarly to another study including sexual orientation and loneliness in the model (Dhuffar et al., 2015a), sexual diversity predicted both PPU and CSBD. The intolerance that sexually diverse individuals deal with can worsen minority stress (Balsam et al., 2011) which leads to a higher risk of developing mental health disorders (e.g., Grant et al., 2014; Obarska et al., 2020; Pollitt et al., 2017). This can be partly explained by homonegativity which can lead to difficult emotions such as loneliness (Whitehead et al., 2016) which was a predictor of problematic sexual behavior (e.g., Efrati and Amichai-Hamburger, 2019a; Torres and Gore-Felton, 2007b). Social support was found to be one of the most important protective factors for psychological well-being among LGBQ people (Doty et al., 2010; Hershberger and D'Augelli, 1995; Meyer, 2010). These factors should also be considered in specific cultural contexts as attitudes towards sexual minority groups may differ between them.

4.6. Limitations

The conducted studies are characterized by a cross-sectional design, thus interpreting causal influence requires caution and should be investigated in future longitudinal studies.

A further limitation to the studies is that some of the regression assumptions were not met in our analyses (see the *Statistical Analysis* section). Therefore, the findings should be interpreted with caution.

Another factor to consider is the worldwide situation due to the COVID-19 pandemic. Both studies were conducted during the pandemic. The use of online pornography during lockdown increased in countries with strict social distancing rules (as in Poland) (Zattoni et al., 2020). Self-isolation was found to predict higher psychopathological symptom severity (see: Xiong et al., 2020), while increased perceived social support was associated with decreased levels of anxiety (Özmete and Pak, 2020). On the other hand, some longitudinal studies showed no increase in the frequency of pornography use or prevalence of PPU or CSBD symptoms during the pandemic (Bőthe et al., 2022; Grubbs et al., 2022; Koós et al., 2022).

It is important to note that members of sexual and gender minorities showed greater depression and anxiety symptom severity during the COVID-19 pandemic (Moore et al., 2021). As perceived social support, as well as both normative and problematic sexual behavior, can be influenced by variables related to the COVID-19 pandemic, the results reported here should be investigated in future studies after the pandemic subsides. Also taking into account cultural context, these predictions should not be generalized to the other countries, and the topic should be further explored.

Moreover, the study is based on self-report measures – future studies would benefit from more objective expert clinical assessment. Additionally, both of the current studies concentrated on perceived social support in three domains: family, friends and significant other, related variables were not included. Future research would benefit from including other related factors describing social relationships and social behavior such as loneliness, attachment styles and socially-oriented coping strategies. Lastly, subsequent studies should also concentrate on sexual minority groups in which the prevalence of problematic sexual behaviors can potentially be higher, and the social support – problematic sexual behavior relations can be mediated and/or moderated by additional factors such as minority stress or internalized homonegativity.

4.7. Implications

All in all, formal recognition of CSBD as a psychiatric disorder creates a need for more detailed knowledge about the complex role of potential risk and protective factors such as perceived social support. Our studies provide evidence for the significant secondary role of social support in predicting the lower severity of CSBD and PPU symptoms. However, importantly, obtained relationships indicated only weak protective predictive power of social support. As other researchers have postulated the significant role of social support for CSBD/PPU (e.g., Långström and Hanson, 2006; Starks et al., 2013; Turner, 2009), future studies should further examine the role of social support in disorder prevention, in its course of development, as well as a supporting factor in therapy.

In our view, based on the current studies, the obtained relationships between social support and CSBD and PPU do not indicate that it should be considered an important factor during the CSBD diagnostic process. However, future studies should investigate the role of other related indicators, including the level of loneliness, social competences and attachment-related variables before firm conclusions can be made. If more evidence corroborating the role of social support for CSBD and PPU symptoms is gathered, the next step should be to design and test interventions aimed at strengthening the social connectedness of people suffering from CSBD and PPU. The research should especially be aimed at more vulnerable (e.g., sexually diverse), and understudied (e.g., women) groups. It should be highlighted that our results are specific to Polish society. As social environment varies greatly across cultures, future research should also aim for cross-cultural comparisons.

5. Conclusion

Summing up, the current studies provide insights into associations between perceived social support from friends, family and a significant

[2] We refrain from discussing the prevalence rates of CSBD and PPU in the current manuscript, as this topic is elaborated on in more detail in our other manuscript (Lewczuk et al., 2022), based on the same dataset analyzed in Study 2, but differing in analytic aims.

other and CSBD and PPU symptom severity. Both conducted studies showed that general social support can, at least to a degree, potentially protect against the development of problematic sexual behavior symptoms. However, relationships obtained for each of the subtypes of social support were relatively weak as well as differed between studies supporting its role probably changing into a secondary factor in the development of CSB (see: Hall, 2013).

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Author statement

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychires.2022.10.021.

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