UNIWERSYTET MEDYCZNY
IM. PIASTÓW ŚLĄSKICH WE WROCŁAWIU

Wydział Nauk o Zdrowiu

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Ocena poziomu lęku u położnic w kontekście elastyczności psychologicznej

Assessment of the level of anxiety in post-partum women in the context of psychological flexibility

Rozprawa na stopień naukowy doktora z dziedziny nauk medycznych i nauk o zdrowiu, w dyscyplinie nauki o zdrowiu

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Wrocław 2023

Podziękowania

„Zdarzyło mi się niegdyś ujrzeć w lesie[*] rano
Dwie drogi; pojechałem tą mniej uczęszczaną -
Reszta wzięła się z tego, że to ją wybrałem”.

Fragment wiersza „Droga nie wybrana” – Roberta Frosta

P.S.
Legenda dla wtajemniczonych: [*]w moim przypadku był to Las Mokrzański ☺

Dziękuję wszystkim, których napotkałam na naukowej drodze, „mniej uczęszczanej”. Jest to droga wyboista, pełna niespodzianek i zwrotów akcji. Bez Waszej inspiracji, motywacji i wsparcia mogłabym zawrócić na drogę „nieznośnej lekkości bytu”.

Spis treści

I. Streszczenie

Wstęp: Elastyczność psychologiczna (EP) jest bazą, która ma szerokie zastosowanie i znaczenie dla jakości życia i zdrowia w różnych populacjach. Jej wyższe zasoby pomagają jednostce prowadzić bogate, wartościowe życie, pomimo dolegliwości związanych z doświadczaniem bólu, lęku lub stresu pandemicznego. Wyższa EP ma związek z lepszym samopoczuciem psychicznym i fizycznym jednostki. Okołoporodowe objawy lęku są powszechne oraz mają istotne znaczenie dla jakości życia matek oraz ich potomstwa w dalszej i bliższej perspektywie. W polskich szpitalach lęk kobiet w połogu nie jest poddawany rutynowo ocenie. Personel medyczny nie dysponuje prostym narzędziem do jego pomiaru. Wysoki lęk okołoporodowy może prowadzić do zaburzeń lękowych u kobiet po porodzie. Jak dotąd nie zanotowano badań nad związkiem lęku z elastycznością psychologiczną u kobiet po porodzie.

Cel pracy: Zbadanie związku poziomu lęku z elastycznością psychologiczną u kobiet po porodzie oraz walidacja numerycznej skali lęku (ang. the Numerical Rating Scale for Anxiety – NRS-A). Dodatkowym celem było zbadanie progu wykrywalności wysokiego lęku w tej populacji na skali NRS-A.

Materiał i metody: Badaniem objęto polskie kobiety po porodzie na oddziale położniczym w Uniwersyteckim Szpitalu Klinicznym we Wrocławiu. Dane zostały zebrane w okresie od grudnia 2020 do kwietnia 2021. Badanie miało charakter prospektywny. Pacjentki zostały poproszone o wypełnienie kwestionariuszy oceniających poziom lęku, bólu, EP w dwóch pomiarach: w pierwszej i w drugiej dobie po porodzie. W celu zbadania rzetelności i trafności NRS-A, skalę tą porównano z wystandaryzowanym narzędziem do pomiaru poziomu lęku-stanu (STAI-S) używanym wyłącznie przez psychologów.

Wyniki: Wykazano, że EP ma ujemny związek z lękiem i bólem polskich kobiet po porodzie. Najsilniej ujemnie EP korelowała z lękiem jako cechą (rho = -0,659; $p < 0,001$). Oba konstrukty psychologiczne wyjaśniły ok. 13% wystąpienia ryzyka zaburzenia lękowego u kobiet w połogu. Dodatkowo w obu pomiarach uzyskano wysokie dodatnie korelacje (w pierwszej dobie rho = 0,807, w drugiej dobie rho = 0,778; $p < 0,001$) pomiędzy STAI-S a poddanym walidacji NRS-A. Oszacowano wartość 3,5/10 na skali NRS-A jako próg wskazania wysokiego lęku u kobiet po porodzie.

Wnioski: EP jest ważnym konstruktem psychologicznym związanym ze stanem psychicznym i fizycznym kobiet po porodzie. Zatem zwiększenie EP u kobiet po porodzie można uznać za ważny cel środków zapobiegawczych i interwencyjnych. Rutynowy pomiar lęku rzetelną

i trafną numeryczną skalą NRS-A może być wykorzystany do identyfikacji pacjentek z ryzykiem zaburzenia lękowego w celu udzielenia im wsparcia emocjonalnego we wczesnym połogu.

Słowa kluczowe: elastyczność psychologiczna; ból; lęk; depresja; COVID-19; opieka w okresie okołoporodowym; opieka w połogu; opieka neonatologiczna; połóg; wynik skierowany na potrzeby pacjenta; wsparcie emocjonalne

II. Abstract

Introduction: Psychological flexibility (PF) is a base that has a wide application and significance for quality of life and health in various populations. Its higher resources help the individual live a rich, worthwhile life despite experiencing pain, anxiety or pandemic stress. Higher PF is associated with better mental and physical well-being of an individual. Perinatal symptoms of anxiety are common and important for the long-term and short-term quality of life of mothers and their offspring. In Polish hospitals, the anxiety of women in the puerperium is not routinely assessed. In addition, medical staff do not have a simple tool to measure this anxiety. High perinatal anxiety can lead to anxiety disorders in women after childbirth. Until now, no studies have been identified that report the relationship between anxiety and psychological flexibility in postpartum women.

Objective: To investigate the relationship between anxiety and psychological flexibility in women after childbirth and to validate the numerical anxiety scale, that is the Numerical Rating Scale for Anxiety (NRS-A). An additional goal was to test the detection threshold of high anxiety in this population on the NRS-A scale.

Material and methods: The study included Polish women after childbirth in the obstetric ward of the University Teaching Hospital in Wrocław. The data were collected from December 2020 to April 2021. The study was prospective in nature. Patients were asked to complete questionnaires that evaluated anxiety, pain, and psychological flexibility in two measurements: on the first and on the second postpartum day. To test the reliability and validity of the NRS-A, this scale was compared with a standardized state anxiety measure (State-Trait Anxiety Inventory – State, STAI-S) used only by psychologists.

Results: The study showed that EP was negatively associated with anxiety and pain in Polish women after childbirth. EF showed the strongest negative correlation with trait anxiety (rho = -0.659; $p < 0.001$). Both psychological constructs explained about 13% of the risk of occurrence of anxiety disorder in women in the puerperium. Furthermore, both measurements showed high positive correlations (rho = 0.807 on the first day, rho = 0.778 on the second day; $p < 0.001$) between STAI-S and NRS-A which was subjected to validation. The value of 3.5/10 on the NRS-A scale was estimated as the threshold for indicating high anxiety in postpartum women.

Conclusions: PF is an important psychological construct related to the mental and physical state of women after childbirth. Thus, increasing EF in women after childbirth can be considered an important goal of preventive and intervention measures. Routine measurement

of anxiety with a reliable and accurate NRS-A scale can be used to identify patients at risk of an anxiety disorder in order to provide them with emotional support in the early puerperium.

Keywords: psychological flexibility; pain; anxiety; depression; COVID-19; care in the perinatal period; care in the puerperium; newborn care; puerperium; result directed at the patient's needs; patient-reported outcome; emotional support

III. Wykaz skrótów

AAQ-2 – Kwestionariusz Akceptacji i Działania (*ang. AAQ-2 Acceptance and Action Questionnaire-2*)

ACT – Terapia Akceptacji i Zaangażowania (*ang. Acceptance and Commitment Therapy*)

APGAR – skala od 0 do 10 służąca do oceny stanu noworodka w pierwszych minutach po porodzie (*ang. Activity, Pulse, Grimace, Appearance, Respiration*)

COVID-19 (*ang. Corona-Virus-Disease-2019*)

EP – Elastyczność Psychologiczna (*ang. Psychological Flexibility – PF*)

GAD – zaburzenie lękowe uogólnione (*ang. General Anxiety Disorder*)

HADS-A – Podskala lęku w Szpitalnej Skali Lęku i Depresji (*ang. Hospital Anxiety and Depression Scale-Anxiety, HADS*)

NICE (*ang. National Institute for Health and Care Excellence*)

NRS – numeryczna skala bólu od 0 do 10 (*ang. the numerical rating scale*)

NRS-A – numeryczna skala lęku od 0 do 10 (*ang. the numerical rating scale for anxiety*)

PI – brak EP lub niska EP (*ang. Psychological Inflexibility*)

PNA – lęk okołoporodowy (ang. perinatal anxiety)

PWE – Potrzeba Wsparcia Emocjonalnego (*ang. Need for emotional support – NES*)

„ROOMING-IN" – oddział położniczy funkcjonujący w systemie samoopieki: „noworodek przez całą dobę przebywa na sali ze swoją mamą"

STAI – Inwentarz Stanu i Cechy Lęku (*ang. State-Trait Anxiety Inventory*)

VASA – skala wizualno-analogowa od 0 do 100 (*ang. the visual analogue scale for anxiety*)

IV. Wstęp

Okołoporodowe objawy lęku i nastroju są powszechne oraz mają istotne znaczenie dla jakości życia matek i ich potomstwa w dalszej i bliższej perspektywie. Wysoki lęk okołoporodowy może prowadzić do zaburzeń lękowych i afektywnych. W połogu kobiety doświadczają lęku uogólnionego, napadów paniki, zgłaszają zaburzenia obsesyjno-kompulsywne, a także stres pourazowy[1-3].

Badanie Silverwood i wsp.[4] wykazało, że zrozumienie z czym wiąże się lęk okołoporodowy (ang. perinatal anxiety – PNA) u położnic, w jaki sposób się manifestuje oraz jakie może mieć konsekwencje zdrowotne jest wśród pracowników ochrony zdrowia niewystarczające. Pracownicy deklarują, że brakuje im wiedzy na temat tego, czym jest „normalny lęk okołoporodowy" oraz prostych narzędzi do jego przesiewowej oceny, a pacjentki z PNA deklarują, że nie dostają wystarczającego wsparcia od personelu. W polskich szpitalach lęk kobiet w połogu nie jest poddawany rutynowo ocenie. Natomiast wnioski z badań prowadzonych w populacjach kobiet w okresie okołoporodowym zawierały rekomendacje, dla wysokiej jakości systemów opieki perinatalnej, dotyczące rutynowej kontroli poziomu lęku i nastroju w tym okresie[5,6].

W związku z powyższym, aby oceniać lęk matek w połogu, personel położniczy powinien dysponować prostym, a jednocześnie trafnym oraz rzetelnym narzędziem do pomiaru tej emocji.

W praktyce klinicznej najczęściej stosowanymi skalami do oceny poziomu lęku są skale opisowe, zawierające pozycje wielokrotne, takie jak: HADS (ang. Hospital Anxiety and Depression Scale), Beck Anxiety Index, STAI (ang. State-Trait Anxiety Inventory)[7]. Wypełnienie ich przez pacjentki w połogu może być utrudnione z powodu braku czasu w związku z opieką nad noworodkiem. Dodatkowo ich interpretacja wymaga posiadania wykształcenia psychologicznego czy szkolenia psychometrycznego.

W badaniach naukowych dotyczących lęku stosowana jest prosta numeryczna, skala wizualno-analogowa od 0 do 100 (ang. Visual Analogue Scale for anxiety – VASA)[8], a także od 0 do 10 (ang. the Numerical Rating Scale for anxiety – NRS-A)[9,10]. Numeryczna skala od 0 do 10 dla badania lęku (NRS-A) przypomina powszechnie stosowaną w praktyce klinicznej skalę NRS (ang. the numerical rating scale) - do oceny bólu[11]. Do tej pory nie poddano walidacji NRS-A w populacji kobiet w połogu.

Standardowe (powszechne) badanie lęku wśród kobiet po porodzie może mieć znaczenie nie tylko do selekcji zaburzeń lękowych u pacjentek w tym okresie, ale przede

wszystkim do zaspokojenia potrzeby wsparcia emocjonalnego kobiet oraz do normalizacji emocji lęku w połogu. Według stanowiska twórców Terapii Akceptacji i Zaangażowania (ang. Acceptance and Commitment Therapy – ACT) lęk, podobnie jak ból, strata, żal oraz rozczarowanie są nieodłącznymi elementami ludzkiego życia. Nie muszą one jednak zaburzać jakości życia jednostki, jeśli nauczy się ona je rozpoznawać oraz reagować na nie z uważnością i akceptacją[12]. Głównym celem ACT jest zwiększenie elastyczności psychologicznej – EP (ang. Psychological Flexebility – PF) – konstruktu, który jest odpowiedzialny za umiejętność jednostki do podejmowania działań zgodnych z wartościami, niezależnie od doświadczanego fizycznego lub psychicznego dyskomfortu (np.: bólu, lęku). EP definiowana jest jako akceptująca, otwarta, świadoma postawa, mająca kontakt z chwilą obecną oraz kontakt ze swoimi emocjami, wrażeniami i myślami. Wyższa EP ma związek z lepszym samopoczuciem psychicznym i fizycznym jednostki. Niska EP powiązana jest z nieakceptacją trudnych myśli i emocji, co prowadzi do unikania ich doświadczania jako sposobu kontrolowania wydarzeń wewnętrznych, co często skutkuje impulsywnym krótkoterminowym odejściem od ważnych życiowych wartości[12-14].

Narzędziem do pomiaru unikania doświadczania trudnych emocji jest kwestionariusz AAQ-2 (ang. AAQ-2 Acceptance and Action Questionnaire-2)[15], w polskiej adaptacji nazwany Kwestionariuszem Akceptacji i Działania[16]. AAQ-2 zostało docenione za wysoką spójność wewnętrzną i wiarygodność w różnych typach chorób psychopatologicznych oraz jest powszechnie stosowane w różnych grupach docelowych[17-21]. Jak dotąd nie zanotowano badań nad związkiem lęku z unikaniem doświadczania u kobiet po porodzie.

V. Cele pracy

Cel główny:

1. Zbadanie związku lęku z elastycznością psychologiczną u kobiet po porodzie.

Cele szczegółowe pracy:

1. Przedstawienie przeglądu badań dotyczącego związku elastyczności psychologicznej z lękiem, depresją, bólem przewlekłym oraz ze stresem wywołanym pandemią COVID-19 w różnych populacjach.

2. Zbadanie trafności i rzetelności numerycznej skali lęku NRS-A w grupie kobiet po porodzie.

3. Określenie progu wykrywalności wysokiego lęku na skali NRS-A.

4. Porównanie lęku położnic w grupach niezależnych: deklarujących potrzebę wsparcia emocjonalnego vs deklarujących brak potrzeby wsparcia emocjonalnego podczas pobytu w szpitalu w dobie pandemii COVID-19.

5. Obliczenie predykcji ryzyka zaburzenia lękowego za pomocą pojedynczych zmiennych objaśniających, takich jak: niska elastyczność psychologiczna oraz lęk jako stan i lęk jako cecha.

6. Porównanie lęku, elastyczności oraz bólu pacjentek w grupach niezależnych: kobiety po porodzie naturalnym vs kobiety po cięciu cesarskim, pierwiastki vs wieloródki oraz pacjentki z wysokim ryzykiem wystąpienia zaburzenia lękowego vs pacjentki z niskim ryzykiem wystąpienia zaburzenia lękowego.

VI. Materiał i metody badań

Część 1

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Health in the context of psychological flexibility and acceptance and commitment therapy, *Medical Research Journal, 2021, vol. 6, nr 3, s. 249-253*, DOI:10.5603/MRJ.a2021.0032

Na podstawie literatury przedmiotu, przedstawiono model elastyczności psychologicznej w powiązaniu z samopoczuciem psychicznym i fizycznym jednostki.
Następnie dokonano przeglądu baz naukowych według słów kluczowych: elastyczność psychologiczna, ból, lęk, depresja, stres, pandemia, COVID-19. Poddano analizie współzależność elastyczności psychologicznej z bólem przewlekłym, lękiem i depresją oraz ze stresem wywołanym pandemią COVID-19 w różnych populacjach.

Część 2

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, *Ginekologia Polska, 2022, vol. 93, nr 9, s. 686-694*, DOI:10.5603/gp.a2021.0197

Prokopowicz, A.; Stanczykiewicz, B.; Uchmanowicz, I. Anxiety and psychological flexibility in women after childbirth in the rooming-in unit during the COVID-19 pandemic, *Journal of Midwifery and Women's Health* 2022 Dec 24. doi: 10.1111/jmwh.13445. Epub ahead of print.

W niniejszym podrozdziale zaprezentowano zarys metodologii przeprowadzonego badania, na podstawie którego napisano dwie powyższe prace oryginalne. Szczegółowy opis zawarty jest w załączonych publikacjach.
Badaniem objęto 200 polskich kobiet po porodzie na oddziale położniczym funkcjonującym w systemie „rooming-in" w Uniwersyteckim Szpitalu Klinicznym we Wrocławiu. Dane zostały zebrane w okresie od 27.12. 2020 do 30.04.2021.

Kryteria włączenia:

- zgoda na udział w badaniu,
- wiek ≥ 18 roku życia,

- urodzenie o czasie (tj., ≥37 tygodni ciąży), pojedynczego noworodka w stanie dobrym (od 8-10 punktów na skali Apgar), zarówno przez cięcie cesarskie, jak i naturalnie,
- dobry stan matki po porodzie (pacjentka uruchomiona, bez cewnika moczowego, bez drenu, z fizjologiczną utratą krwi w trakcie porodu, zakwalifikowana do przekazania na oddział położniczy wraz z noworodkiem), a także brak stwierdzonej psychicznej, umysłowej, ortopedycznej dysfunkcji w wywiadzie.

Kryteria wyłączenia:

- wiek < 18 roku życia,
- pacjentki po porodzie przedwczesnym,
- matki, których stan noworodka był oceniony poniżej 8 punktów w skali Apgar,
- pacjentki, których stan po porodzie nie pozwalał na zajmowanie się dzieckiem na oddziale położniczym,
- pacjentki, u których stwierdzono w wywiadzie: zaburzenie psychiatryczne, niepełnosprawność umysłową oraz ortopedyczną.

Badanie miało charakter prospektywny. Pacjentki zostały poproszone o wypełnienie kwestionariuszy w dwóch pomiarach: w pierwszej dobie (T1 – po 24 h od porodu do 48h) i w drugiej dobie po porodzie (T2 – od 48 h od porodu do 72h). Dane dotyczące stanu położniczego, przeszłości chorobowej pacjentki, stanu zdrowia noworodka pozyskane zostały z historii choroby pacjentki i noworodka.

W obu dobach pacjentki wypełniły NRS-A, STAI-S oraz PWE. Dodatkowo w dobie pierwszej po porodzie (T1) wypełniły STAI-T, AAQ-2 oraz w drugiej dobie (T2) HADS-A, NRS oraz skale dla specyficznych poporodowych lęków. W celu zbadania rzetelności i trafności numerycznej skali lęku – NRS-A porównano ją z wystandaryzowanym narzędziem do pomiaru lęku-stanu (STAI-S).

Za brak danych uznano niekompletne wypełnienie kwestionariuszy lub ich niewypełnienie. W T2 zanotowano 13 braków dla lęku mierzonego HADS-A. Z powyższego powodu, obliczenia, w których brany będzie pod uwagę kwestionariusz HADS-A będą wykonywane na grupie 187 kobiet.

Średnia wieku dla grupy 200 kobiet wyniosła 32 (od 21do 43 lat). Większość pacjentek (83%) deklarowała wyższe wykształcenie, dobrą sytuację materialną (87,1%) oraz pożycie w związku formalnym (78%). W badanej grupie 56% pacjentek urodziło dziecko drogą cięcia cesarskiego, a 44% naturalnie.

Średnia wieku dla 187 pacjentek wyniosła 32 lata (od 22 do 43). Większość pacjentek (83,4%) deklarowała wyższe wykształcenie, dobrą sytuację materialną (88,8%) oraz pożycie w związku formalnym (78,6%). Ponad połowa kobiet (56,1%) urodziła drogą cięcia cesarskiego, a 43,9% urodziła naturalnie. Swoje pierwsze dziecko urodziło 49,7% matek, a kolejne dziecko (wieloródki) 50,3%.

Narzędzia badawcze

Pomiar lęku: (HADS-A; STAI, NRS-A, specyficzne lęki poporodowe)

Szpitalna Skala Lęku

Polska adaptacja kwestionariusza Szpitalna Skala Depresji i Lęku (Hospital Anxiety and Depression Scale) autorstwa Zigmonda i Snaitha umożliwia ocenę poziomu lęku i depresji pacjentów w warunkach szpitalnych. Lęk można ocenić używając niezależnej podskali Szpitalna Skala Lęku (Hospital Anxiety and Depression Scale-Anxiety – HADS-A) składającej się z 7 pytań. Za każde można uzyskać od 0 do 3 punktów – maksymalna ilość punktów to 21. Punkt odcięcia dla zaburzenia lękowego rozpoczyna się powyżej 10 punktów. Alfa Cronbacha dla HADS-A w badaniu wyniosło – 0,829.

Inwentarz Stanu i Cechy Lęku

Polska adaptacja Inwentarza Stanu i Cechy Lęku STAI (ang. State-Trait Anxiety Inventory) składa się z dwóch oddzielnych skal: X-1 dla lęku jako stanu (STAI-S) oraz X-2 dla lęku jako cechy (STAI-T). Obie skale składają się z 20 pytań. Całkowite ciągłe wyniki wahają się od minimum 20 do maximum 80. Im wyższy wynik łączny, tym wyższy jest poziom lęku. Alfa Cronbacha w badaniu własnym wyniosło dla lęku stanu (STAI-S) – 0,959 oraz dla lęku cechy (STAI-T) – 0,854.

Numeryczna skala lęku (ang. Numerical Rating Scale for anxiety – NRS-A) oraz specyficzne lęki poporodowe (skala od 0 do 10)

Numeryczna skala lęku (Numerical Rating Scale Anxiety – NRS-A) od 0 do 10 (0 – oznacza brak lęku, a 10 – największy lęk jaki można sobie wyobrazić) używana jest do pomiaru lęku jako stanu. Dodatkowo pacjentki zostały poproszone o podanie subiektywnych poziomów (na skali od 0 do 10) specyficznych lęków, takich jak lęk: przed samodzielną opieką nad dzieckiem w dzień, przed samodzielną opieką nad dzieckiem w nocy, przed płaczem dziecka, przed zachorowaniem na COVID-19.

Pomiar elastyczności psychologicznej

Do zbadania elastyczności psychologicznej (EP) posłużyła polska adaptacje: Kwestionariusza Akceptacji i działania (ang. AAQ-2 Acceptance and Action Questionnaire-2). AAQ-2 składa się z 7 stwierdzeń typu: „Boję się swoich uczuć", „Emocje są przyczyną problemów w moim życiu". AAQ-2 bada najczęściej występującą tendencję unikania doświadczania w życiu dorosłym osoby badanej. Odpowiedzi udzielane są na siedmiostopniowej skali (1-nigdy nie prawdziwe, do 7-zawsze prawdziwe). Minimalna ilość uzyskanych punktów 7, maksymalna 49. Wyższe wyniki wskazują na niższą EP. W opisie badań skrót określający niższe wartości kwestionariusza AAQ-2 będzie oznaczany jako EP (lub wyższa EP) (ang. Psychological Flexibility - PF), natomiast wyższe wyniki jako brak EP (lub niska EP) (ang. Psychological Inflexibility - PI). Alfa Cronbacha dla AAQ-2 wyniosło – 0,857.

Numeryczna skala do pomiaru bólu

Numeryczna skala (ang. Numerical Rating Scale – NRS) od 0 do 10, powszechnie używana jest do pomiaru bólu, gdzie 0 – oznacza brak bólu, a 10 – największy ból jaki można sobie wyobrazić.

Potrzeba wsparcia emocjonalnego (PWE)

Potrzebę wsparcia emocjonalnego – PWE (ang. Need for emotional suport NES) oceniono za pomocą pojedynczego pytania własnego autorstwa: „W mojej obecnej sytuacji potrzebuję wsparcia emocjonalnego". Odpowiedzi udzielane były na 6-stopniowej skali Likerta

(1–„Zdecydowanie się nie zgadzam", 2 – „Nie zgadzam się", 3 – „Trochę się nie zgadzam", 4 – „Trochę się zgadzam", 5 – „ Zgadzam się" oraz 6 – „Zdecydowanie się zgadzam"). Na potrzebę wyselekcjonowania pacjentek, które deklarują potrzebę wsparcia emocjonalnego vs nie potrzebują wsparcia, odpowiedzi od 1 do 3 włączono do grupy pacjentek nie potrzebujących wsparcia emocjonalnego, a odpowiedzi od 4 do 6 do grupy pacjentek deklarujących potrzebę wsparcia emocjonalnego.

Analiza statystyczna

Do analizy statystycznej wykorzystano program IBM SPSS Statistics 26 (IBM Corp., Armonk, NY, USA). Otrzymane wartości statystyk wykazały, że wszystkie zmienne wykazały istotne rozbieżności od rozkładu normalnego. Do porównania wyników w grupach niezależnych wykorzystano testy U Manna-Whitneya, a w grupach zależnych Wilcoxona. Związek między zmiennymi policzono za pomocą korelacji rho Spearmana. Do predykcji

ryzyka zaburzenia lękowego użyto jednoczynnikowej regresji logistycznej (z R-kwadrat Nagelkerkego) oraz analizy ROC (ang. Receiver operating characteristic). Przyjęto istotność pomiarów dla wartości $p < 0,05$.

Etyka i finansowanie

Badanie zostało zatwierdzone przez Komisję Bioetyczną przy Uniwersytecie Medycznym we Wrocławiu, Polska (Nr KB – 747/2020). Realizowane było ze środków własnych.

VII. Cykl publikacji

Podstawą niniejszej pracy doktorskiej jest cykl trzech publikacji:

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Health in the context of psychological flexibility and acceptance and commitment therapy, *Medical Research Journal, 2021, vol. 6, nr 3, s. 249-253*, DOI:10.5603/MRJ.a2021.0032

Praca przeglądowa

MEiN = 100,00

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, *Ginekologia Polska, 2022, vol. 93, nr 9, s. 686-694*, DOI:10.5603/gp.a2021.0197

Praca oryginalna

MEiN = 40,00

IF = 1,216

Prokopowicz, A.; Stanczykiewicz, B.; Uchmanowicz, I. Anxiety and psychological flexibility in women after childbirth in the rooming-in unit during the COVID-19 pandemic, *Journal of Midwifery and Women's Health* 2022 Dec 24. doi: 10.1111/jmwh.13445. Epub ahead of print.

Praca oryginalna

MEiN = 100,00

IF = 2,891

Lp	Opis bibliograficzny	IF	Punkty
1	**Prokopowicz Anna**, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Health in the context of psychological flexibility and acceptance and commitment therapy, Medical Research Journal, 2021, vol. 6, nr 3, s. 249-253, DOI:10.5603/MRJ.a2021.0032	-	100
2	**Prokopowicz Anna**, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, Ginekologia Polska, 2022, vol. 93, nr 9, s. 686-694, DOI:10.5603/gp.a2021.0197	1,216*	40
3	**Prokopowicz A[nna],** Stańczykiewicz B, Uchmanowicz I. Anxiety and Psychological Flexibility in Women After Childbirth in the Rooming-in Unit during the COVID-19 Pandemic. Journal of Midwifery & Women's Health 2022 Dec 24. doi: 10.1111/jmwh.13445. *Epub ahead of print.*	2,891*	100
	Podsumowanie	4,107	240

Impact Factor: 4,107

Punkty ministerialne: 240,0

30.12.2022 r. Beata Majewska

Uniwersytet Medyczny we Wrocławiu
Biblioteka Główna
DZIAŁ BIBLIOGRAFII I BIBLIOMETRII
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VIA MEDICA

REVIEW ARTICLE

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Health in the context of psychological flexibility and acceptance and commitment therapy

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Medical Research Journal 2021; Volume 6, Number 3, 249–253
10.5603/MRJ.a2021.0032

ISSN 2451-2591
e-ISSN 2451-4101

ABSTRACT

Losing health is associated with an imbalance in one or more areas that are important to an individual. The spectacular achievements of modern medicine have made people believe that the only source of health is the treatment and reduction of symptoms. The ability to function in conditions of unavoidable discomfort can bring back an individual's loss of balance. The article aims to present the model of Psychological Flexibility and its relationship with selected health aspects of an individual. According to the statement of the founders of Acceptance and Commitment Therapy (ACT), suffering in various forms is an integral part of human life. In situations of discomfort that cannot be avoided, and with which an individual must learn to function on a daily basis over a longer period of time, ACT proposes the development of Psychological Flexibility, which strengthens the psyche and body's immune resistance. The Covid-19 pandemic, which has been going on for a year, has disrupted the macro balance. At the micro-scale, this balance can be disturbed by chronic disease states such as pain, anxiety and depression. The above conditions reduce the quality of life and health. Psychological Flexibility shapes a set of skills that improve the quality of life and also affect balance despite perceived discomfort. Psychological Flexibility is a base that has a wide application and significance for the quality of life and health. Its higher resources help an individual live a rich, worthwhile life despite suffering from pain, anxiety or pandemic stress.

Key words: psychological flexibility, pain, anxiety, depression, pandemic, Covid-19

Med Res J 2021; 6 (3): 249–253

Introduction

Health is one of the most important values for individuals and the whole society [1]. There are over a hundred definitions of health [2]. They are often based on various, separately treated planes: biological, psychological, or social. Health can be presented as the absence of disease and suffering; as biopsychosocial well-being; as a state of the balance; as a function; as a social role; as the ability to adapt; or as a value norm or asset [3]. These planes are linked by the holistic, still valid, definition of the World Health Organization (WHO), according to which health is perceived as "a state of total physical, mental and social well-being" [4].

Regardless of the adopted definition, loss of health is associated with an imbalance (distraction of well-being) in one or more areas that are important for an individual. This, in turn, makes it difficult, or impossible, to function, and deteriorates the quality of life [5]. Western civilization glorifies the absence of physical and mental discomfort. The spectacular achievements of modern medicine have made people believe that the source of health is treatment and the reduction of symptoms [6]. In the field of health psychology, prophylaxis and health promotion, effective methods are being sought, which are based on scientific evidence, and which improve the health level of individuals and the entire society [7].

Scientific research shows that Acceptance and Commitment Therapy (ACT) is effective in promoting healthy behavior, while at the same time improving the quality of life and mental well-being of cardiological, cancer, and irritable bowel syndrome patients who suffer from anxiety and affective disorders [8–13].

ACT belongs to the "third wave" of the Cognitive Behavioral Therapy (CBT) trend. Both CBT and ACT base their effectiveness on scientific evidence [14]. According

to the statement of the founders of Acceptance and Commitment Therapy, suffering, disease, pain, loss, grief, fear and disappointment are inseparable elements of human life [15]. However, they do not have to interfere with an individual's quality of life if they learn to respond to them with awareness. ACT teaches a person to lead an attentive and conscious life and changes the relationships of an individual with undesirable symptoms in such a way that their occurrence does not interfere with leading a life that is consistent with values. The "side effect of therapy" is often the reduction of symptoms. In turn, the main goal of ACT is to increase PF — a construct that is responsible for the ability of an individual to act in line with values, regardless of the experienced physical or mental discomfort (e.g. pain, anxiety) [15, 16]. PF negatively correlates with such personality trait as neuroticism, whereas it positively correlates with an openness to experience and self-control. PF influences a person's health globally and helps to smoothly maintain a balance between important areas in their life, which appear to be the specific mental resilience of an individual [17]. Therefore, PF seems to be important in the context of an individual's resource in situations of discomfort that cannot be avoided, and also in which one has to learn to function on a daily basis over a longer period of time.

This article presents the model of Psychological Flexibility (PF) and its relationship and protective effect on selected health aspects of an individual. The theoretical assumptions of ACT and the PF model are presented on the basis of leading references in this field [15, 16]. Additionally, the relationship between PF and chronic pain, anxiety and depression, as well as stress caused by the Covid-19 pandemic, was analyzed. Scientific databases were reviewed using the following keywords: psychological flexibility, pain, anxiety, depression, stress, pandemic, Covid-19.

Psychological flexibility and acceptance and commitment therapy

PF is a construct that is responsible for the ability of an individual to freely choose an action, the direction of which is compatible with the goals and values of the individual, regardless of the experienced difficult thoughts, emotions and sensations. PF has developed in the area of Contextual Behavioral Science (CBS), the source of which has its origin in the classical behavioral analysis [18]. The main goal of CBS is the scientific prediction of behavior in a specific context and its modification [19]. Through the prism of PF, thoughts, emotions and experiences do not have a good or bad label, with their evaluation taking place in a specific context for a given situation. The lower the PF, the more the person, under the influence of an experienced discomfort (e.g. anxiety or pain) reduces (slows down) their actions (while losing the sense of their meaning) [15]. The higher the level of PF, the more an individual can consciously choose a course of action that is consistent with their goals and life values, regardless of their emerging thoughts, emotions or impressions. Moreover, they can persevere in this action [15].

Participation in Acceptance and Commitment Therapy increases and strengthens PF. Through its motivational nature, ACT helps to make an individual aware of which values mean a lot to them and also provides direction to their life [16]. It teaches careful observation and acceptance of one's emotions, thoughts and feelings, which in turn improves the quality of life and functioning of an individual with psychiatric, somatic or social problems [20–22]. Meta-analyzes have shown that ACT has a greater potential to induce psychological benefits and effectiveness in the long term perspective when compared to classical CBT methods [23, 24].

The PF model consists of six processes, such as acceptance, cognitive defusion, flexible focus on the present moment, self-as-context, values, and engaged action. They are responsible for shaping PF and taking action in accordance with the values adopted in life. In turn, their opposition, i.e., avoidance of experience, cognitive fusion, lack of flexible attention, the conceptualized self, the lack of awareness of values, passivity, impulsiveness, and persistent avoidance are responsible for adaptive abilities [15]. PF shapes psychological skills or a set of skills that have a wide application and go beyond a single state of mental or physical health [22]. For example, it appears as a mechanism that explains the influence of personality on the well-being of an individual [25]. The correlation of PF with personality traits, which influence the quality of life, shows the possibility of developing adaptive resources along with the development of PF, regardless of the basic structure of personality [26]. A higher PF is associated with a better mental well-being of obese people, with a higher quality of life in people with type I diabetes, and it also positively correlates with a higher mental resistance of people after trauma [27–29].

Psychological flexibility versus pain

The Central Statistical Office (CSO) in Poland [30] lists among the six most common chronic diseases/health diseases: chronic back, neck and joint pain. Chronic pain can be caused by damage to the nervous system, undetectable pathology, or psychogenic pain. This type of pain proves the changes that have taken place in the body and becomes a disease that is often very difficult to treat [31]. Chronic pain affects all areas of an individual's life. It may contribute to the development of depression [32]. If it is not possible to eliminate it,

an important element of functioning will be adapting to bothersome symptoms. Patients report a slowdown in life as a consequence of chronic pain. Pain accompanied with anxiety, as a variable closely related to fear and avoidance, has a significantly detrimental effect on the quality of life of patients [33]. Some data show that it is not the level of pain, but the attitude towards it, that affects the functioning of a person [34].

The chronic low back pain (CLBP) model assumes that fear of pain is related to avoiding painful movements. It was originally developed to explain the transformation of acute back pain into chronic pain [35]. The CLBP model is currently used for research that links the subject of anxiety and pain with the development of disabilities of a broader scope than just chronic back pain [36].

A study on a sample of 252 people with chronic pain showed that PF is an important mediating factor in the relationship between symptoms (pain and anxiety intensity) and the functioning of the respondents. People with lower PF showed sickness absenteeism much more often than people with higher PF [37]. Similar results were obtained in other studies concerning the relationship between PF and the adaptive functioning of people with chronic pain. Higher PF, reflected in acceptance, mindfulness, cognitive defusion, and acting on values, was responsible for more frequent use of health care and more frequent undertaking of jobs [38]. The studies of Rhodes [39] found that chronic pain patients with a higher PF used fewer opioids. Various PF measures have proved to be significant mediators of therapeutic treatment in patients with chronic pain [40]. The participation of patients with chronic pain in ACT increases their PF and acceptance of pain, improves their daily functioning, and reduces their level of depression [41].

Psychological flexibility versus anxiety and depression

In Poland, in 2018, neurotic disorders (approx. 30%) and affective disorders (approx. 20%) were ranked in the first two places among people suffering from mental and drug-free behavior disorders [42]. Coexisting anxiety and depression are responsible for the mental condition of patients - exacerbating the chronicity and severity of any psychiatric and somatic diagnosis, reducing the quality of life, hindering professional development, and increasing the risk of suicide [43–45]. In a longitudinal study, anxiety predicted subsequent depression, which was measured after 12–14 years [45].

There is evidence that higher PF and adaptive emotional schemas show a negative correlation with anxiety [46]. A study on a group of HIV-infected people indicates that higher PF is responsible for lower mental health rates (lower levels of anxiety and depression), as well as a higher quality of life [47]. Higher PF scores were reliable predictors of mental health (lower anxiety and depression) in homosexual men who underwent screening for anal cancer risk. It should be added, however, that the relationship between PF and mental health in this study was mediated by Difficulty Identifying and Describing Feelings (DIDF). Low levels of PF may increase DIDF, and this, in turn, leads to higher levels of anxiety and depression [48].

A study by Masuda and Tully [49] indicated that lower PF in the American student population was associated with higher levels of depression and anxiety. Psychological Inflexibility (PI) in Turkish students partially mediates in the relationship between anxiety against negative evaluation and psychological susceptibility associated with a wide range of mental disorders (with the dominant style of avoidance reactions) [50]. The anxiety of public speaking reported by the student correlated with lower PF in the domains of openness to experience and higher cognitive fusion [51].

Psychological flexibility versus functioning during the Covid-19 pandemic

In Poland, more than two and a half million infections and over 60,000 deaths have been recorded since the beginning of the Covid-19 pandemic (from March 4, 2020, to this day) [52]. Undoubtedly, the Covid-19 pandemic has had a negative impact on the mental health of citizens, which is measured by the level of anxiety and depression [53, 54]. Research indicates PF as an important factor in mental resilience to stress caused by the current Covid-19 pandemic. PF negatively correlates with anxiety, depression, insomnia and suffering from the pandemic, and positively correlates with well-being and coping with avoidance [55, 56]. A lack of PF increases the risk of suicide in the pandemic era [57], whereas a greater openness to experience, and behavioral awareness (as measures of PF) were associated with lower general and peri-traumatic distress in the context of the pandemic [58].

A study conducted during the lockdown in Italy on a group of 1,035 adults showed that global PF and its four subtypes (self-as-context, defusion, values, and engaged action) reduced the destructive impact of Covid-19 risk factors (such as duration of isolation, increase in domestic violence and unhealthy behavior, and infection of relatives with Covid-19) on mental health [59]. A longitudinal study based on 3 measurements and conducted during the lockdown in Spain showed that the lack of PF in the first measurement indirectly predicted symptoms of mental health in the last measurement through autoregressive parallel paths and directly in the same measurement [60]. A study of patients with chronic pain during the Covid-19 pandemic

showed that PF processes such as pain acceptance, self-as-context, and engaged action can play a protective role in demonstrating anxiety and avoidance [61].

An American study of family functioning during pandemic stress found that a lack of parental PF was associated with depression, Covid-19 stress, discord between family members, toxic parenting, and greater suffering for both parents and their children. Similarly, higher PF measures were associated with greater family cohesion and the use of constructive parenting strategies such as inductive, democratic behavior and positive and supportive parenting practices [62].

Conclusions

PF is a factor of mental resilience that has wide applications and is relevant to the quality of life and health. Its higher resources help an individual live a rich, worthwhile life despite suffering from pain, anxiety or pandemic stress. The strength of this construct is that it can be developed and strengthened within ACT, which in turn may affect all areas of mental, physical and social health, including self-care and raising children [21, 41, 63–65]. The advantage of ACT is its empirical, scientific verifiability. ACT can be used by psychologists, psychotherapists, doctors, and other people involved in improving the health of individuals [22]. Scientific and diagnostic work may be facilitated by the availability of free, reliable research tools that are validated on the Polish population [66, 67]. Therefore, it is worth considering the study of PF on the Polish population and the use of ACT intervention techniques that can improve the health condition of Polish society in times of a pandemic.

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VIA MEDICA

ORIGINAL PAPER / GYNECOLOGY

Ginekologia Polska
2022, vol. 93, no. 9, 686–694

ISSN 0017–0011, e-ISSN 2543–6767

DOI 10.5603/GP.a2021.0197

Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study

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ABSTRACT

Objectives: Perinatal anxiety is important for the quality of life of mothers and their offspring. The Numerical Anxiety Rating Scale (NRS-A) allows the level of anxiety in patients to be quickly assessed. Until now, the NRS-A has not been validated in the postpartum female population. The aim of this study was to assess the accuracy and reliability of the NRS-A when compared with the reference methods for measuring anxiety.

Material and methods: The observational prospective study included a group of 200 adult postpartum females of a hospital maternity ward. The validity between the Numerical Rating Scale for Anxiety (NRS-A) and the State and Trait Anxiety Inventory (STAI), and between the NRS-A and the Hospital Anxiety and Depression Scale (HADS-A), was determined. The detection thresholds for high anxiety were examined.

Results: Both measurements showed a positive high correlation between the NRS and STAI-S (in T1 rho = 0.807, in T2 rho = 0.778; $p < 0.001$), and a comparable relationship of both scales (STAI-S and NRS-A) with the STAI-T and HADS-A. The analysis of the ROC curve indicated that the value of the NRS-A equal to 3.5/10 can be considered the threshold that allows for a differentiation of patients with high anxiety from those without high anxiety in the studied population.

Conclusions: The NRS-A is an accurate tool for measuring anxiety in Polish postpartum females. Routine anxiety measurements using the NRS-A can be used to identify people with high anxiety in order to provide emotional support to patients in the early postpartum period.

Key words: anxiety; postpartum period; patient-oriented outcomes; emotional support

Ginekologia Polska 2022; 93, 9: 686–694

INTRODUCTION

The perinatal symptoms of anxiety and mood are common and important for the long-term and short-term quality of life of mothers and their offspring. High perinatal anxiety can lead to anxiety and affective disorders. In the postpartum period, women experience generalized anxiety disorder and panic attacks. In addition, obsessive-compulsive disorder, as well as acute and post-traumatic stress disorder symptoms may occur [1–4].

In populations of women evaluated in the perinatal period, anxiety and depressive disorders coexist [5, 6]. In the group of women diagnosed with postpartum depression, anxiety disorders were also found in 82.9% of them, and vice versa — in women with primary anxiety disorders, coexisting depressive disorders were found [7]. Some evidence shows that the incidence rate of perinatal anxiety is about 22%, which is higher than the incidence rate of perinatal depression (13%) [8].

Conclusions from studies conducted on populations of women in the perinatal period include recommendations for high-quality prenatal care systems regarding the routine control of anxiety and mood levels in this period [9, 10]. The Polish standard of perinatal care only recommends examining the perinatal risk of depression [11]. Moreover, it is standard in hospital care that patients are informed about their right to pain treatment. However, there

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Received: 17.08.2021 Accepted: 30.08.2021 Early publication date: 14.10.2021

are no such recommendations for anxiety, even though studies show that pain coexists with anxiety [12–14].

The study of anxiety among women in the postpartum period may not only be important for the selection of anxiety and depressive disorders in perinatal patients, but above all for the description and normalization of anxiety emotions in this population. According to the authors of Acceptance and Commitment Therapy, anxiety, as well as pain, loss, regret and disappointment, are inseparable elements of human life [15]. However, in order to discuss maternal anxiety in the postpartum period on the basis of scientific evidence, maternity staff should have a simple and relevant tool to measure it. A study by the Silverwood team (2019) [16] shows that there is insufficient understanding of what perinatal anxiety is among healthcare professionals. Employees declare that they lack knowledge concerning "normal perinatal anxiety", as well as simple tools for its screening. In turn, patients with perinatal anxiety declare that they do not receive sufficient support. The recommendations of the National Institute for Health and Care Excellence (NICE) include a provision concerning the recommendation of the assessment of the support needed by women with mental health problems, as well as the women at risk of developing them [17].

Commonly used scales to assess anxiety levels include descriptive scales, such as: Hospital Anxiety and Depression Scale (HADS) for measuring anxiety (A) and depression (D), Beck Anxiety Inventory, and State-Trait Anxiety Inventory (STAI) for measuring two separate anxiety concepts: state anxiety (S) and trait anxiety (T) [12, 18]. STAI-S, due to its high accuracy and reliability in various populations, is the recommended tool for measuring state anxiety [18, 19]. The results of testing the level of state anxiety are sensitive to the variability of anxiety, which depends on situations related to external stimuli [20]. The listed questionnaires contain multiple items. The filling in of them by postpartum females may be difficult due to the lack of time that is related to having to care for their newborns. In the case of limited time possibilities, it is reasonable to use quick measurement scales, e.g., a single 0 to 10 numerical rating scale (NRS), which is commonly used to measure pain. Despite its simplicity, its validity and reliability have also been demonstrated [21]. The twin NRS for anxiety (NRS-A) has been tested in the dental and pediatric patient population [22, 23]. Until now, the NRS-A has not been validated in the postpartum female population.

Therefore, the aim of this study is to answer the question of whether NRS-A is a valid and reliable measurement tool for assessing state anxiety in postpartum women in the first days of puerperium when compared to the reference STAI-S method. An additional goal is to test the detection threshold of high anxiety using the NRS-A, as well as to compare the anxiety of patients in two independent groups: those declaring a need for emotional support versus those declaring no need for emotional support.

MATERIAL AND METHODS

Population and settings

The place of study was the maternity ward in the 2nd Department of Gynaecology and Obstetrics of the Wroclaw Medical University, Poland. 200 women during their first and second postpartum days were included in the study. The data was collected in the period from 27/12/2020 to 04/30/2021. Adult patients, who gave conscious consent to the study and who gave birth at term (i.e., ≥ 37 hbd) to a single newborn in good condition (from 8–10 Apgar points), both by caesarean section and naturally, were enrolled in the research. The condition for inclusion in the study was also the good condition of the mother after childbirth (patient mobilized, with physiological blood loss during childbirth, no blood transfusion, qualified to "rooming" (maternity ward) with their newborn, and with no diagnosed mental, psychological, or orthopaedic dysfunctions).

Data concerning the patient's postpartum condition, medical history, and the health of their newborn were obtained from the medical history of the patient and newborn. The study was confidential. Access to the collected data was secured, and each of the studied participants was given an identification number, which enabled the data to be anonymized.

Tools

Numerical Rating Scale for anxiety (NRS-A)

The raw anxiety scores on a numerical scale from 0 to 10 were categorized as: 0 – not anxious, 1–3 — little/slightly anxious, 4–6 — medium/fairly anxious, 7–9 — a lot/very anxious, 10 — worst imaginable/extremely anxious [22, 23].

State-Trait Anxiety Inventory (STAI)

The STAI, which was developed from its original version, was adapted to the Polish population by the Spielberger team [20, 24]. It consists of two separate scales, which both have 20 questions. The total continuous scores range from a minimum of 20 to a maximum of 80. The higher the total score, the higher the level of state anxiety [at a given time on the X-1 scale (STAI-S)] and trait anxiety [on the X-2 scale (STAI-T)]. The obtained results are interpreted on three levels: low anxiety (1–4 sten), moderate anxiety (5–6 sten) and high anxiety (7–10 sten). The cut-off point for high state anxiety starts above 40 [20]. Cronbach's alpha in our study was for state anxiety (STAI-S) tested on the first day (T1) — 0.956 and second day (T2) — 0.958, and for trait anxiety it was (STAI-T) — 0.850.

Hospital Anxiety and Depression Scale (HADS)

The HADS questionnaire by Zigmond and Snaith (1983) [25] enables the level of anxiety and depression of patients

Table 1. Individual measurements of the observed variables during the study, and the number of correctly completed questionnaires for a group of 200 postpartum females

Variable	Questionnaire	Measurement T1	Measurement T2
State anxiety	STAI-S-X1	X (n = 200)	X (n =200)
Trait anxiety	STAI-T-X2	X (n = 200)	–
State anxiety	NRS-A	X (n = 200)	X (n = 200)
Anxiety	HADS-A	–	X (n = 187)
Need for emotional support	NES	X (n = 200)	X (n = 200)

X — presence of measurement; – — lack of measurement

in hospital conditions to be assessed. The Polish adaptation of the questionnaire was made by the Majkowicz team (2000).[26] Anxiety can be assessed using the independent subscale of the Hospital Anxiety and Depression Scale-Anxiety (HADS-A), which consists of seven questions. For each of them, 0 to 3 points (the maximum number of points is 21) can be achieved. The cut-off point for an anxiety disorder is a score greater than 10 points. Cronbach's alpha for HADS-A in the present study — 0.829.

Need for Emotional Support (NES)

The need for emotional support was tested using the question developed by authors: "In my current situation, I need emotional support." The answers were given on a 6-point Likert scale (1 — "I strongly disagree", 2 — "I disagree", 3 — "I disagree a little", 4 — "I agree a little", 5 — "I agree", and 6 — "I strongly agree"). Single-question scales that fit the specific clinical situation of patients are used in scientific publications [27]. For the purpose of selecting patients who declared a need for emotional support vs those that did not need support, answers from 1 to 3 were included in the group of patients who did not need emotional support, and answers from 4 to 6 were included in the group of patients who declared a need for emotional support.

Bioethics committee

A written informed consent to participate in the study was obtained from all the patients. The study was approved by the Bioethics Committee at Wroclaw Medical University, Wroclaw, Poland (KB No. 747/2020).

The presentation of measurements at both timepoints

After giving informed consent to participate in the study, the patients were asked to fill in questionnaires at two timepoints: on the first postpartum day (T1) and on the second postpartum day (T2). On both days, the patients completed NRS-A, STAI-S-X1 and NES. Additionally, on the first postpartum day (T1), they completed STAI-T-X2, and on the second day (T2) they completed HADS-A. The individual measurements over time are presented in Table 1. Incomplete, or blank questionnaires were considered as missing data. In T2, there were 13 deficiencies for anxiety measured using HADS-A.

Statistical analysis

The IBM SPSS Statistics 26 program (IBM Corp., Armonk, NY, USA) was used for statistical analysis. Due to the non-Gaussian distribution of all the variables, non-parametric tests were used for the analysis. The relationship between NRS-A, STAI and HADS-A is shown by Spearman's correlation coefficient (rho). The non-parametric Mann-Whitney U test was used to compare independent groups, and the Wilcoxon test was used to compare dependent groups. NRS-A thresholds of differentiation with regards to anxiety or non-anxiety (defined by the reference STAI-S cut-off point equal to 40, and HADS equal to 10) were determined based on Receiver Operating Characteristic (ROC) curves and their related area under the ROC curve (AUC). The significance of the measurements was assumed for the value of $p < 0.05$.

The sample size, with an estimated mean effect size and an alpha error probability of 0.05, was determined according to literature [23].

Participants

In the study, 200 women aged Mdn = 32 (range: 21–43) took part. Most of the patients (83%) declared higher education, a good financial situation (87.1%) and living in a formal relationship (78%). In the study group, 56% of patients gave birth to a child by caesarean section (Tab. 2).

RESULTS

The descriptive statistics for the tools used in the study are presented in Table 3. The Wilcoxon test showed no differences in the measurements between the first (T1) and the second (T2) day in the case of anxiety measured using STAI-S ($Z(199) = -0.658$; $p > 0.5$) and in the case of anxiety measured using NRS-A ($Z(199) = -1.928$; $p > 0.5$).

Correlations of comparable strength were shown between the dependent measurements (T1 with T2). They

were calculated separately for NRS-A (rho = 0.708; p < 0.001) and for STAI-S (rho = 0.701; p < 0.001).

Correlations between the NRS-A, STAI and HADS-A measurements

The correlations between STAI-S and NRS-A were positive and high in both measurements (p < 0.001). They amounted to in T1 rho = 0.807, in T2 rho = 0.778. A graphical representation of the relationship between STAI-S and NRS-A for individual measurements is shown in Figure 1.

Table 2. Characteristics of the studied group

Parameter	Total (n = 200)
Age	
20–30 years old	81 (40.5%)
31–40 years old	113 (56.5%)
41–50 years old	6 (3%)
Type of childbirth	
Natural childbirth	88 (44%)
Childbirth by caesarean section	112 (56%)
Education	
Higher	166 (83%)
Secondary	19 (9.5%)
Vocational	11 (5.5%)
Lower secondary	3 (1.5%)
Primary	1 (0.25%)
Financial status	
Good	175 (87.5%)
Average	23 (11.5%)
Poor	2 (1%)
Marital status	
Formal relationship	156 (78%)
Informal relationship	33 (16.5%)
Single	11 (5.5%)

The correlation between STAI-T and NRS-A, and STAI-T and STAI-S, as well as between HADS-A and NRS-A and HADS-A and STAI-S showed positive correlations of similar strength and significance (p < 0.001) for both scales (Tab. 4).

Cut-off points on the NRS-A scale

Analysis of the ROC curve for the 200 patients suggested a value of 3.5/10 on the NRS-A scale as the threshold for high anxiety (defined by the reference STAI-S cut-off of 40) in both measurements (in T1 AUC = 0.886; p < 0.001 and in T2 AUC = 0.860; p < 0.001). Both measurements showed acceptable values of sensitivity (T1 — 0.803; T2 — 0.702) and specificity (T1 — 0.843; T2 — 0.849) (Fig. 2).

The analysis of the ROC curve for 187 patients suggested a value of 4.5/10 on the NRS-A scale for T1 and T2 (for STAI-S the value of 42.5/80 in T1, and the value of 50.5/80 in T2) as a threshold to indicate the risk of an anxiety disorder (defined by the HADS-A reference cut-off of 10). The model adjustment values on the first day (T1) for NRS-A were: AUC = 0.852; p < 0.001; sensitivity = 0.895; and specificity = 0.678; and for STAI-S they were: AUC = 0.842; p < 0.001, sensitivity = 0.947, and specificity = 0.617. The model adjustment values on the second day (T2) were for NRS-A: AUC = 0.880; p < 0.001, sensitivity = 0.842, and specificity = 0.792; and for STAI-S: AUC = 0.863; p < 0.001, sensitivity = 0.711, and specificity = 0.846 (Fig. 3).

Levels of anxiety by the need for emotional support

From the group of 200 patients, 101 (50.5%) declared a need for emotional support on the first day (T1), and 96 (48.0%) patients on the second day (T2). The Mann-Whitney U test showed, in both the NRS-A and STAI-S scores, a higher (p < 0.001) level of anxiety in the group of women declaring a need for emotional support when compared to the group of women not declaring a need for emotional support (Tab. 6).

Table 3. Descriptive statistics for NRS-A, STAI, HADS-A, and NES in T1 and T2

Questionnaire and the measurement (T)	n	Mdn	IQR	Min	Max
NRS-A_T1	200	4	4	0	10
NRS-A_T2	200	3	3	0	10
STAI-S_T1	200	42.5	16	20	79
STAI-S_T2	200	42	17.75	20	77
STAI-T_T1	200	37	10	21	68
HADS-A_T2	187	7	6	0	20
NES_T1	200	4	3	1	6
NES_T2	200	3	3	1	6

HADS-A — Hospital Anxiety and Depression Scale-Anxiety; IQR — interquartile range; Mdn — median; Min — minimum value; Max — maximum value; n — number of subjects; NES — need for emotional support; NRS-A — Numerical Rating Scale for Anxiety; STAI-S — State and Trait Anxiety Inventory-State Anxiety

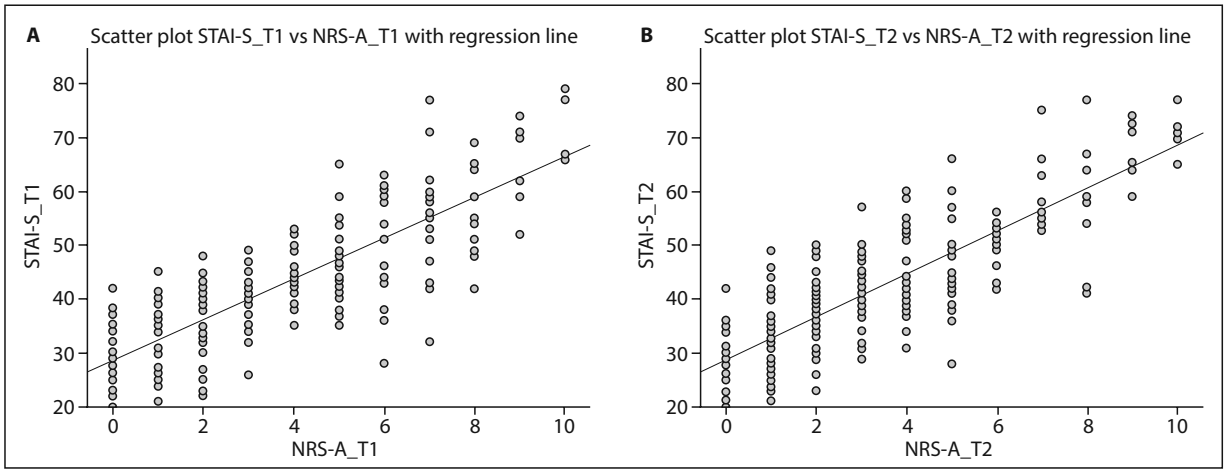

Figure 1. Scatter plots for correlations between STAI-S and NRS-A for both timepoints; **A.** Scatter plot for STAI-S_T1 *vs.* NRS-A_T1 with a regression line [Y = 3.769 (± 0.193)·X + 28.670 (± 0.927); p < 0.001; R2 = 0.658]; **B.** Scatter plot for STAI-S_T2 vs NRS-A_T2 with a regression line [Y = 3.990 (± 0.200)·X + 28.620 (± 0.901); p < 0.001; R2 = 0.667]

Table 4. Correlation between trait anxiety measured using STAI-T (n = 200) and HADS-A (n = 187) with state anxiety measured using NRS-A and STAI-S for the measurements at two timepoints

Spearman's correlation coefficient	T1		T2	
	NRS-A	STAI-S	NRS-A	STAI-S
STAI-T_T1	0.336	0.387	0.354	0.406
p-value	0.000	0.000	0.000	0.000
HADS-A_T2	0.716	0.733	0.686	0.691
p-value	0.000	0.000	0.000	0.000

HADS-A — Hospital Anxiety and Depression Scale-Anxiety; NRS-A — Numerical Rating Scale for Anxiety; STAI-S — State and Trait Anxiety Inventory-State Anxiety; STAI-T — State and Trait Anxiety Inventory-Trait Anxiety

DISCUSSION

Internal consistency of the results for state anxiety on the STAI-S scale in the present study, in both measurements (evaluated by Cronbach's alpha), was high (above 0.9) and comparable to the reliability of the STAI-S results for Polish women in the age range of 21–40 years (0.89) [20]. This value is comparable to Cronbach's alpha STAI-S value in scientific literature [28–30]. The high reliability of measurements using the STAI-S questionnaires in the study allows these tools to be used as a reference for NRS-A validation. The other standardized anxiety measuring tools (STAI-T and HADS-A) were also highly reliable.

The results of both measurements carried out in the present study showed a high positive correlation between NRS-A and STAI-S. They suggest a high convergence validity between the NRS-S and STAI-S tools. Although there is little evidence in the literature, the relationship between NRS-A and STAI-S was shown to be stronger than reported by other researchers. This corelation in our study was stronger than that obtained in the group of adult dental patients (rho = 0.6563; p < 0.05) [23], as well as in the group of pediatric patients (r from 0.424 to 0.639) [22]. In the present study, the corelation between NRS-A and STAI-S was stronger than this in studies which also compared other single-item scales, such as VAS-A to STAI-S in patients undergoing surgical procedures (r = 0.555 to 0.593) [31]. It was also similar or stronger when compared to the corelation measured with VAS-A and STAI-S in three timepoints (at admission to the operation theatre: r = 0.76, p < 0.001; at skin closure: r = 0.60, p < 0.001; two hours after the procedure: r = 0.65, p < 0.001) [32] in patients undergoing cesarean section [32]. The strength of the correlation between NRS-A and STAI-T was slightly weaker than the strength of the correlation between STAI-T and STAI-S, and slightly stronger than the correlation between NRS-A and STAI-T (r = 0.3456, p < 0.05) obtained the study by Walawender et al. [23]. Positive correlations between NRS-A and HADS-A of a similar strength as between STAI-S and HADS-A were obtained. The above results enable NRS-A to be considered as a relevant tool for measuring state anxiety in Polish postpartum females.

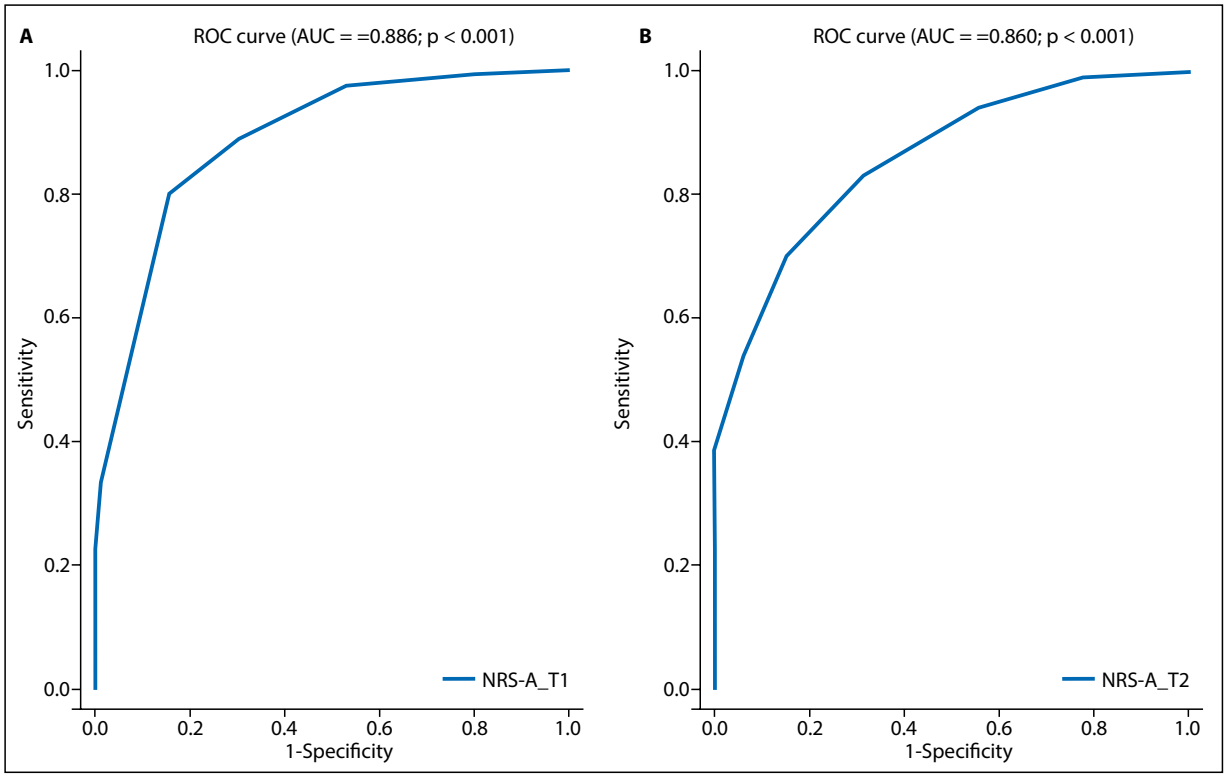

Figure 2. ROC curves; **A.** ROC curve calculated for NRS-A_T1 using STAI-S_T1 where a score of more than 40 was selected as an indicator of high anxiety. A NRS-A cut-off value of 3.5/10 reflected the best combination of sensitivity (80%) and specificity (84%); **B.** ROC curve calculated for NRS-A_T2 using STAI-S_T2 where a score of more than 40 was selected as an indicator of high anxiety. A NRS-A cut-off value of 3.5/10 reflected the best combination of sensitivity (80%) and specificity (85%)

The absolute stability values for state anxiety measured using STAI-S in two measurements with an interval of 3–4 weeks for women and men of different ages range from 0.39 to 0.81. In the group of 25 Polish women aged 21–40, the absolute stability is r = 0.59 [20]. Obtaining a similar high strength of dependent measurements (using the absolute stability method with the retest test) of state anxiety between the first day and the second day on both scales (NRS-A — rho = 0.708 and STAI-S — rho = 0.701), as well as obtaining a lack of differences in the anxiety level measured on both scales, allows NRS-A to be considered as a reliable tool.

No studies concerning the determination of the cut-off point were found for patients with high anxiety on NRS-A. The present research filled this gap. The cut-off points for separating patients with high anxiety using STAI-S equal to 40 was selected according to the recommendation of the manual for the Polish version of STAI-S for the group of women in the age range of 21–40. This is similar to the age of the studied population in the author's previous study [20], and also similar to the studies that validate the single visual analogue scale for anxiety (VAS-A) from 0 to 100 [31, 33].

The obtained (on the basis of the ROC curve analysis) cut-off point of 3.5/10 on NRS-A is similar to the values obtained by Labaste et al. on VAS-A with a shift of one decimal place (34/100) [31], and lower than the values obtained by Facco et al. (46/100) [33]. Measurements were conducted at two points (using the test-retest method). In both measurements, the values of the cut-off point coincided with each other. The range for high anxiety on NRS-A should therefore be 4 and above (considering that the STAI-S cut-off point is equal to 40). However, it should be noted that in the group of 90 women, which is a group that normalizes the sten in the Polish STAI adaptation for 21-40 years old, the mean state anxiety was 36.80 (the median was not given), i.e. it considered the group of patients without high anxiety [20]. In the author's study, for 200 women after childbirth, the median of anxiety in the first day was 42.5, and in the second day was 42. Both medians are in the high anxiety group. For this reason, the value of 3.5/10 on NRS-A for identifying patients with high anxiety should be treated as a starting point for further research concerning the identification of high anxiety in women during the puerperium.

Additional evidence of the reliability of the measurement using NRS-A in relation to STAI-S is the comparability of the similar values of the AUC, sensitivity and specificity of both ROC curve models for the thresholds that indicate the risk of an anxiety disorder in patients (defined by

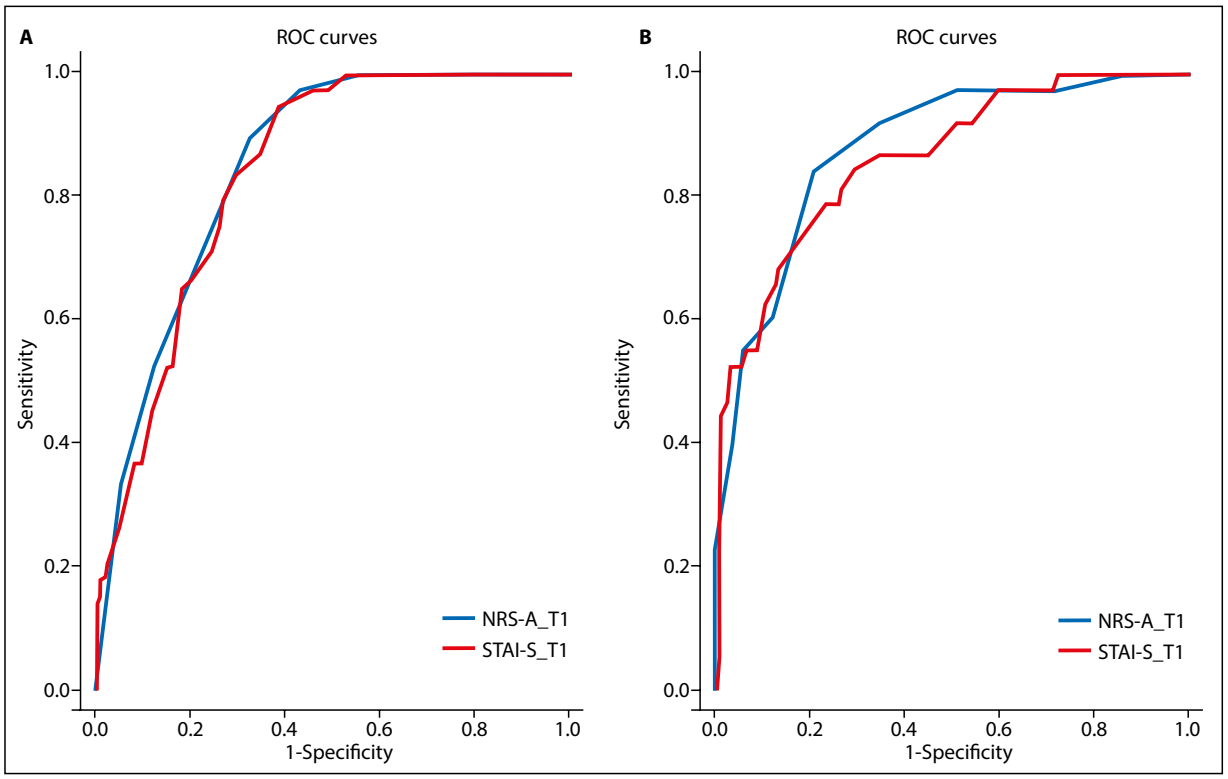

Figure 3. ROC curves; **A.** Calculated for NRS-A_T1 (AUC = 0.852; p < 0.001) and for STAI-S_T1 (AUC = 0.842; p < 0.001) using HADS-A, where a score of more than 10 was selected as an indicator of anxiety disorders. A NRS-A cut-off value of 4.5/10 reflected the best combination of sensitivity (89%) and specificity (69%). A STAI-S cut-off value of 42.5/80 reflected the best combination of sensitivity (95%) and specificity (62%); **B.** Calculated for NRS-A_T2 (AUC = 0.880; p < 0.001) and for STAI-S_T2 (AUC = 0.863; p < 0.001) using HADS-A, where a score of more than 10 was selected as an indicator of anxiety disorders. A NRS-A cut-off value of 4.5/10 reflected the best combination of sensitivity (84%) and specificity (79%). A STAI-S cut-off value of 50.5/80 reflected the best combination of sensitivity (71%) and specificity (85%)

Table 5. Anxiety (measured using NRS-A and STAI-S) in the group of patients declaring no need for emotional support (NES1) vs the group of patients declaring a need for emotional support (NES2) on the first (T1) and the second (T2) day

	Mdn	Mrang	Mdn	Mrang	Z(U)	p
	NES1_T1 (n = 99)		NES2_T1 (n = 101)			
NRS-A_T1	2	75.21	5	125.29	–6.155	< 0.001
STAI-S_T1	37	72.66	49	127.79	–6.739	< 0.001
	NES1_T2 (n = 104)		NES2_T1 (n = 96)			
NRS-A_T2	2	75.43	4.5	127.66	–6.422	< 0.001
STAI-S_T2	37	77.46	46.5	125.46	–5.863	< 0.001

Mdn — median; NRS-A — Numerical Rating Scale for Anxiety; STAI-S — State and Trait Anxiety Inventory-State Anxiety

the reference cut-off point on HADS-A equal to 10). Marking the cut-off point on a straight line using the NRS-S scale allows for the quick identification of patients with a high level of anxiety during the puerperium.

The innovative implementation of dividing patients in the author's study into those reporting a need for emotional support or those reporting a lack of such a need made it possible to assess the levels of anxiety in these groups on both scales (NRS-A and STAI-S). Similar results of the Mann-Whitney U test on both scales confirmed a significant difference in the levels of anxiety in both groups. In the group of patients reporting a need for emotional support in both measurements, the mean level of anxiety was above the cut-off point for patients with high anxiety in the case of both tools (over 3.5 on NRS-A and over 40 on STAI-S). In turn, in the group of patients reporting no need for emotional support in both measurements, the average level of anxiety was below the cut-off point for patients with high anxiety in the case of both tools.

The ability to measure anxiety in a simple way allows for a quick preliminary qualification of patients for emergency interventions. Considering both days of puerperium, the need for emotional support was declared by nearly half of the patients. The NICE guidelines[17] recommend the monitoring of the emotional state of women in the perinatal period and the use of evidence-based relief interventions. The NRS-A scale, tested in terms of its accuracy and reliability, may facilitate the assessment of puerperal anxiety. An additional advantage of NRS-A is its free availability and its similarity to the well-known NRS for assessing pain, which is recommended for use in hospitals [12, 34]. It takes a few seconds for the respondent to provide a one value for anxiety experienced at a given moment [22]. Taking into account the period of early puerperium, in which postpartum females may feel discomfort caused by pain and in which they also have a limited time to fill in time-consuming questionnaires (due to the need of caring for their newborn), NRS-A gives the opportunity to assess anxiety in a simple, quick, accurate and honest way.

The limitation of the study is the fact that patients from only one clinical centre were examined, and that the evaluated population was homogenic in terms of the patients' health, education and economic situation, as well as the health of their children.

CONCLUSIONS

The present study showed that NRS-A is a valid and reliable tool for measuring anxiety in postpartum females. Routine anxiety measurements with a numerical single-item postpartum scale can be used to identify patients with high anxiety in order to provide emotional support to patients in early postpartum.

Conflict of interest

All authors declare no conflict of interest.

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Journal of Midwifery & Women's Health www.jmwh.org
Research Article

Anxiety and Psychological Flexibility in Women After Childbirth in the Rooming-in Unit during the COVID-19 Pandemic

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Introduction: The coronavirus disease 2019 (COVID-19) pandemic has intensified perinatal anxiety disorders. Psychological flexibility (PF), considered a specific mental toughness, has not been examined with regard to its relationship with anxiety in women after childbirth. We aimed to compare levels of anxiety, PF, and pain in women depending on the mode of birth, parity, and the magnitude of risk of developing an anxiety disorder. We also investigated the association of anxiety with PF and pain.

Methods: A total of 187 women after childbirth completed validated questionnaires for anxiety (State-Trait Anxiety Inventory, Hospital Anxiety and Depression Scale-Anxiety, Numerical Rating Scale for anxiety [NRS-A]), PF, and pain (Numerical Rating Scale for pain). Specific postpartum anxieties were assessed with a numerical scale from 0 to 10. The relationship of anxiety with PF and pain was examined. Women at low and high risk of developing anxiety disorder were compared in terms of PF, anxiety, and pain.

Results: On the second postpartum day, women after cesarean birth demonstrated significantly greater anxiety on NRS-A and pain than those after vaginal birth. Primiparous women experienced significantly greater anxieties and pain compared to multiparous women. The higher the PF patients demonstrated, the less anxiety and pain they had. Patients at high risk of developing an anxiety disorder had a lower level of PF ($P < .001$) and higher levels of anxiety ($P < .001$) and pain ($P < .01$) than patients at low risk of developing an anxiety disorder. No difference in the anxiety of getting COVID-19 was observed between the groups ($P > .05$).

Conclusions: PF is an important psychological construct related to the mental and physical condition of women after childbirth. Increasing PF in women after childbirth may be considered as an important goal of preventive and intervention measures.
J Midwifery Womens Health 2022;0:1–10

Keywords: anxiety, psychological flexibility, pain, puerperium, rooming-in

INTRODUCTION

Psychological flexibility (PF) appears to be a specific mental toughness of an individual, thus having a overall impact on his or her health. Psychological inflexibility (PI) is the opposite of PF and is associated with many forms of psychopathology.[1] PF is defined as an accepting, open, and conscious attitude, in which one is in contact with the present moment and contact with one's emotions, impressions, and thoughts. High PF is related to the ability of an individual to freely choose an action whose direction is consistent with the goals and long-term values, even under conditions of experienced discomfort. Conversely, PI is related to not accepting difficult thoughts and emotions, which leads to the avoidance of experiencing them as a way to control internal events, often resulting in an impulsive short-term departure from important life values. It also is based on the dominance of psychological reactions over chosen values in actions and attitudes. PF consists of 6 processes: acceptance, cognitive defusion, flexible contact with the present moment, self as context, values, and committed action.[2,3] PF has its source in contextual behavioral science, the aim of which is to scientifically predict behavior in a specific context, as well as the possibility of modifying it.[4,5]

Acceptance and commitment therapy (ACT) focuses on increasing the level of PF, influencing the improvement of the adaptive functioning of the individual.[2] Research shows that ACT is effective in the improvement of quality of life and psychological well-being, as well as promoting healthy behavior among patients with somatic and psychological disorders.[6–11] ACT assumes that suffering, fear, pain, and loss are inherent elements of human life. They do not disturb the actions of a person following the values chosen in life if the person can react to them with acceptance, openness, and mindfulness.[2] For example, studies have shown that higher PF is associated with better well-being in people with obesity and after trauma, as well as higher quality of life and functioning of people with diabetes.[12–14] PF is also a mediator that has a protective function against the risk of developing depression in new mothers of premature newborns.[15]

On the other hand, numerous studies have shown that the psychological condition of women after childbirth is

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1526-9523/09/$36.00 doi:10.1111/jmwh.13445

Quick Points

- Psychological flexibility (PF) is an important psychological construct related to the mental and physical condition of women after childbirth.
- The higher PF patients show after childbirth, the less anxiety and pain they experience.
- First-time mothers had higher levels of anxiety of caring for a newborn and of the newborn crying.
- The levels of PF, trait anxiety, and anxiety of getting COVID-19 did not differ significantly between women with different modes of birth and parity.

related to perceived anxiety[16–18] and co-occurring pain.[19] The frequency of anxiety disorders is higher than that of depressive disorders.[20] A high level of pain and anxiety may limit a woman's mobility and ability to care for a newborn[21,22]; for this reason, researchers seek predictors of perinatal pain and anxiety.[23–25]

A high level of pain and anxiety may limit the functioning of women in the rooming-in unit. Rooming-in is a system that allows the newborn to stay in the same room with the mother for 24 hours a day.[26] A woman, with the support of the staff, can carry out most of the nursing activities for the newborn on her own. A study conducted among Polish women staying in the rooming-in unit showed that postpartum pain, anxiety disorders, and the lack of support from visitors during the coronavirus disease 2019 (COVID-19) pandemic contributed to the deterioration of the psychological condition of women after childbirth.[27] A meta-analysis showed that during the COVID-19 pandemic, an increase in depressive and anxiety symptoms in pregnant women was observed.[28] Studies performed in various countries during the COVID-19 pandemic showed that PF was related to better mental and physical functioning as well as better well-being of people during lockdown.[29–31] In some studies, a measure of people's well-being is the association between higher PF and lower levels of perceived anxiety and pain.[32–36] In Poland, partners can participate in newborn care; however, during the COVID pandemic, partners were not allowed in rooming-in units. Restricted visitation likely increased the anxiety of women in rooming-in units; however, the relationship between anxiety and PF during this time has not been studied.

The primary goal of this study was to explore the relationship between PF and anxiety in women in the rooming-in unit during the COVID-19 pandemic. A secondary goal was to test whether variables such as PF, anxiety (measured with questionnaires other than Hospital Anxiety and Depression Scale-Anxiety [HADS-A]), and pain could predict anxiety disorder risk.

METHODS

Population and Settings

The study was conducted in the obstetric ward functioning in the rooming-in system in a tertiary hospital, the University Teaching Hospital, Wrocław, Poland. This tertiary hospital has a cesarean birth (CB) rate of approximately 50%, similar to other centers with the same level of care. The overall incidence of CB is 42% in Poland.[37] The study included 200 white women 18 years and older staying with their newborns in this ward on the second day (48-72 hours) after birth. Inclusion criteria were adult women who gave birth at term (≥37 weeks' gestation), Apgar score ≥ 8, CB or vaginal birth (VB), and stable postpartum condition (absence of drains, catheters, or abnormal postpartum blood loss). Exclusion criteria were unstable postpartum condition (presence of drains, catheters, or postpartum hemorrhage) and history of a psychiatric disorder. The patients' level of anxiety, PF, level of pain, and demographics were assessed by self-report.

The data were collected from December 2020 to April 2021. Missing data were present in 13 of 200 enrolled participants; therefore, the final sample was 187 women.

The study was confidential. All patients gave written informed consent to participate in the study. The study was approved by the Commission of Bioethics at Wroclaw Medical University, Poland (KB – 747/2020).

Scales

Anxiety Measurement

There is a distinction between anxiety as a temporary, transient emotional state (state anxiety) and anxiety understood as a persistent, permanent personality trait, expressed in the readiness to react with anxiety in certain situations: anxiety as a trait (trait anxiety).

HADS-A

The Polish adaptation of the Hospital Anxiety and Depression Scale developed by Zigmond and Snaith[38] enables an assessment of the level of anxiety and depression of patients in a hospital setting during the past week (state anxiety).[39] Anxiety can be assessed using an independent subscale—the HADS-A, consisting of 7 questions. Each question is scored from 0 to 3 points that sum up to 21 points. Scores greater than 10 denote increased risk of anxiety disorder.[40]

State-Trait Anxiety Inventory

The Polish adaptation of the State-Trait Anxiety Inventory (STAI) consists of 2 separate scales: X-1 for anxiety as a state (STAI-S) and X-2 for anxiety as a trait (STAI-T).[41,42] Both scales include 20 questions. The total score ranges from a minimum of 20 to a maximum of 80. The higher the total score, the higher the anxiety level.

Numerical Rating Scale for Anxiety

The Numerical Rating Scale for Anxiety (NRS-A) ranges from 0 to 10 (0 denotes no anxiety, 10 denotes the most severe

anxiety imaginable). The scale is used to measure state anxiety. Despite its simplicity, it is valid and reliable.[43,44]

Specific Postpartum Anxiety Scales

Additionally, patients were asked to provide subjective levels of specific anxiety, also rated from 0 to 10. The scales included questions about the anxiety of self-care for a newborn during the day, the anxiety of self-care for a newborn at night, the anxiety of a newborn crying, and anxiety of getting COVID-19.

PF Measurement

Acceptance and Action Questionnaire-2

PF was measured using the Acceptance and Action Questionnaire-2 (AAQ-2).[45,46] AAQ-2 consists of 7 statements such as "I'm afraid of my feelings," and "Emotions cause problems in my life." AAQ-2 examines the most common tendency to avoid experiencing in adult life. The answers are given on a 7-point scale (from 1: never true to 7: always true) and sum up to a total score ranging from 7 to 49. Higher scores indicate lower PF (PI). In the description of our research, lower values of the AAQ-2 questionnaire are marked as PF, whereas higher values are marked as PI. Cronbach's α for AAQ-2 was 0.857.

Pain Measurement

The Numerical Rating Scale for pain (NRS) ranges from 0 to 10 (0 denotes no pain, 10 denotes the most severe pain imaginable). It is commonly used in clinical practice to measure pain. Despite its simplicity, it has been shown to be valid and reliable.[47]

Study Protocol

After giving their informed consent to participate in the study, patients were asked to complete the following questionnaires: STAI-T, AAQ-2, NRS, NRS-A, STAI-S, HADS-A, and specific postpartum anxiety scales.

Statistical Analysis

Statistical analysis was conducted using IBM SPSS Statistics 26 (IBM Corp, Armonk, NY). All the variables showed significant discrepancies from the normal distribution. Independent groups were compared using the Mann-Whitney U test. Correlations were evaluated with Spearman's ρ coefficient. One-way logistic regression (Nagelkerke's R^2) and receiver operating characteristic (ROC) analysis were used to predict the risk of an anxiety disorder. The significance of the measurements was assumed for the value of $P < .05$.

The sample size was estimated using the G* power package.[48] A priori, the Mann-Whitney U test (2 groups) with an average effect size of d = 0.50, with power $(1 - \beta)$ of 0.95 and with a probability level of $\alpha = 0.05$, was used. For these assumptions, the groups should have 92 people each (a total sample size of at least 184).

Table 1. Demographic Characteristics of Women in the Rooming-in Unit (N = 187)

Characteristic	Value, n (%)
Parity	
1	93 (49.7)
2	82 (43.9)
3	10 (5.3)
4	2 (1.1)
Mode of birth	
Vaginal birth	82 (43.9)
Cesarean birth	105 (56.1)
Gestational age	
37 wk	16 (8.6)
38 wk	56 (29.9)
39 wk	56 (29.9)
40 wk	36 (19.3)
41 wk	22 (11.8)
42 wk	1 (0.5)
Education	
University	156 (83.4)
Secondary	17 (9.1)
Vocational	10 (5.3)
Lower secondary	3 (1.6)
Primary	1 (0.5)
Financial situation	
Good	166 (88.8)
Moderate	19 (10.2)
Poor	2 (1.1)
Marital status	
Formal relationship (married)	147 (78.6)
Informa relationship (partnership)	31 (16.6)
Single	9 (4.8)

RESULTS

The mean age of the group of 187 patients was 32 years (range, 22-43 years). Most of the patients declared higher education (83.4%), good financial situation (88.8%), and living in a formal relationship (78.6%). More than half of the women (56.1%) gave birth by CB, and 43.9% gave birth naturally. Overall, 49.7% of participants were primiparous women, whereas 50.3% were multiparous women (Table 1).

Internal Consistency of the Scales Used

Cronbach's α for the HADS-A in this study was .83. We defined the group of patients who scored ≤10 on HADS-A as being at low risk of developing an anxiety disorder, whereas a group of patients who scored >10 was defined as being at high risk of developing an anxiety disorder. Cronbach's α for the STAI was .96 for state anxiety and .85 for trait anxiety. Cronbach's α for AAQ-2 was .86.

Comparison of Patients by Mode of Birth and Parity

Patients reported greater pain after CB than after VB ($P < .01$) and higher anxiety using the NRS-A scale after CB than after VB ($P < .05$). There was no significant difference ($P > .05$) in the levels of trait anxiety, hospital anxiety (HADS-A), state anxiety (on the STAI-S scale), specific postpartum anxiety, or PF by mode of birth. Primiparous women reported higher levels of anxiety (on the STAI-S, NRS-A, HADS-A, and anxieties related to care of the newborn and crying) and pain than multiparous women. There was no significant difference between primiparous and multiparous women with respect to levels of trait anxiety, anxiety of getting COVID-19, and PF (Table 2).

Comparison of Patients at Low and High Risk of Developing Anxiety Disorders by PF, Pain, and Anxiety

Of 187 puerperal women, 79.7% (n=149) were at low risk of developing an anxiety disorder and 20.3% (n=38) were at high risk of developing an anxiety disorder based on scores on the HADS-A. The Mann-Whitney *U* test showed that patients at high risk of developing an anxiety disorder had significantly higher levels of pain ($P < .01$) and anxiety as a state and trait ($P < .001$) than patients at low risk. High-risk patients also had a higher level of anxiety of self-care for a newborn during the day and at night and of the newborn crying than low-risk patients ($P < .001$). There was no statistically significant difference between the groups in the level of anxiety of getting COVID-19 ($P > .05$). Patients at a higher risk of developing an anxiety disorder had a lower PF level ($P < .0001$) than patients at lower risk of developing an anxiety disorder (Table 3).

Relationship Between Anxiety and PF

The first step in investigating the relationship between anxiety and PF was to measure the bivariate correlations between the AAQ-2 score and the different measures of state anxiety. As a comparison, correlations were also measured between a degree of patient's flexibility and other measures, such as pain and trait anxiety. Statistically significant positive relationships were found between all examined anxieties and PI, pain, and trait anxiety. The higher the PF patients demonstrated, the less anxiety and pain they had. The strongest positive relationship was noted for PI and trait anxiety ($\rho = 0.659$; $P < .001$), whereas the weakest was for PI and pain ($\rho = 0.168$; $P < .05$). The correlations are depicted in Table 4.

Anxiety Disorder Risk Prediction

The next step of the analysis was to calculate the anxiety disorder risk prediction using single explanatory variables, such as PF, anxiety (measured with questionnaires other than HADS-A), and pain (Table 5). One-way logistic regression showed that the anxiety disorder can be predicted by NRS-A (R^2, 46.7%) or STAI-S (R^2, 44.9%) among considered scales. Both NRS-A (odds ratio [OR], 1.957; 95% CI, 1.588-2.411) and STAI-S (OR, 1.149; 95% CI, 1.098-1.203) were significant predictors. Trait anxiety explained a similar percentage of variance (R^2, 13.8%; OR, 1.113; 95% CI, 1.053-1.176) to PI (R^2, 13.1%; OR, 1.103; 95% CI, 1.049-1.160).

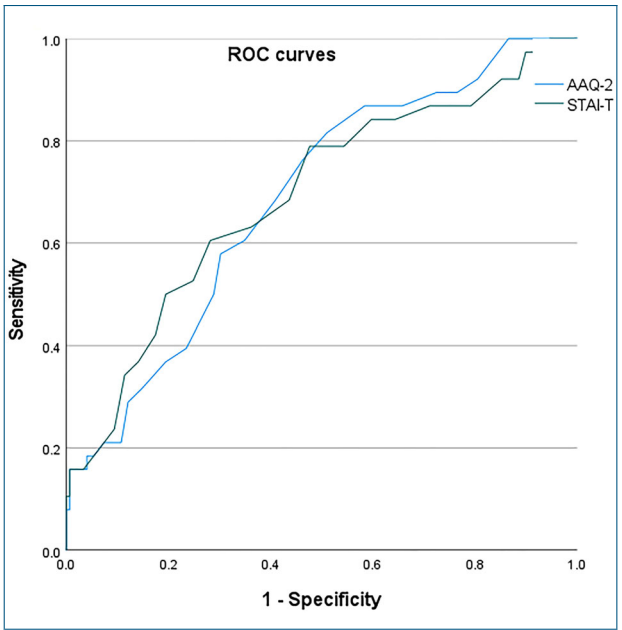

Figure 1. Receiver Operator Curves for AAQ-2 and STAI-T Predicting Anxiety

Calculated for the Acceptance and Action Questionnaire-2 (AAQ-2) (area under the curve [AUC] = 0.687; $P < .001$) and for the State-Trait Anxiety Inventory, anxiety as a trait (STAI-T) (AUC = 0.690; $P < .001$) using the Hospital Anxiety and Depression Scale-Anxiety, in which a score of >10 was selected as an indicator of anxiety disorders. An AAQ-2 cutoff value of 14.50/49 reflected the best combination of sensitivity (82%) and specificity (49%). An STAI-T cutoff value of 39.50/80 reflected the best combination of sensitivity (60%) and specificity (72%).

ROC analysis found that AAQ-2 and STAI-T were sufficeint predictors of a high risk for developing anxiety disorder. The model parameters for AAQ-2 were area under the curve (AUC) = 0.687; $P < .001$; sensitivity = 0.816; and specificity = 0.490; for STAI-S they were AUC = 0.690; $P < .001$, sensitivity = 0.605, and specificity = 0.718 (Figure 1). The analysis suggested a value of 14.50/49 on the AAQ-2 scale and the value of 39.50/80 on the STAI-T as thresholds to indicate the risk of an anxiety disorder (defined by the HADS-A reference cutoff of 10).

DISCUSSION

Our study showed that on the second postpartum day, patients after CB showed significantly greater anxiety on the NRS-A scale and pain than patients after VB, and primiparous women had significantly higher levels of most anxieties and pain than multiparous women. Patients at high risk of developing an anxiety disorder additionally had a lower level of PF than patients at low risk of developing an anxiety disorder. PF was shown to be negatively correlated with anxiety and pain in women after childbirth.

Patients of our study after CB had higher levels of pain ($P < .001$) and anxiety as a state ($P < .05$) on NRS-A than patients after VB. The groups did not differ in terms of anxiety measured by the STAI and HADS-A questionnaires. However, as shown by Klages et al, significant correlations occur between anxiety (STAI-S and STAI-T) and pain in women undergoing amniocentesis and chorionic villus biopsy.[49] We revealed that the NRS-A correlates with the perceived pain ($\rho = 0.545$, $P < .001$). Labaste et al validated the use of NRS-A in patients after

Table 2. Comparison of Mood by Mode of Birth and Parity for Women in the Rooming-in Unit (N = 187)

	Median (IQR)	Median, IQR, Mean Rank				Median, IQR, Mean Rank			
		Vaginal Birth	Cesarean Birth			Primiparous	Multiparous		
Questionnaire	Total (N = 187)	(n = 82)	(n = 105)	*U* (*Z*)	*P* Value	(n = 93)	(n = 94)	*U* (*Z*)	*P* Value
AAQ-2	16.00 (9.00)	16.00	16.00	0.662	.508	16.00	15.50	0.100	.920
		10.00	9.00			8.00	10.00		
		91.04	96.31			93.60	94.39		
STAI-T	37.00 (10.00)	37.00	38.00	0.568	.570	37.00	37.50	0.285	.775
		9.25	9.00			9.00	11.00		
		91.46	95.99			92.87	95.12		
STAI-S	42.00 (17.00)	42.00	42.00	1.065	.287	42.00	40.00	2.367	.018
		20.50	16.00			17.00	18.00		
		89.23	97.72			103.41	84.69		
NRS-A	3.00 (3.00)	3.00	3.00	2.038	.042	4.00	2.00	4.321	<.001
		4.00	4.00			4.00	3.25		
		84.94	101.08			111.07	77.11		
HADS-A	7.00 (6.00)	6.00	7.00	1.317	.188	8.00	5.50	2.467	.014
		7.00	6.00			7.00	6.00		
		88.12	98.59			103.78	84.32		
NRS	4.00 (3.00)	3.00	4.00	5.599	<.001	4.00	3.00	3.259	.001
		3.00	3.00			2.00	2.25		
		69.24	113.34			106.81	81.33		
Anxiety of self-care for a newborn during the day	2.00 (4.00)	2.00	2.00	1.528	.127	3.00	1.00	5.002	<.001
		3.25	4.00			4.00	3.00		
		87.27	99.26			113.58	74.63		
Anxiety of self-care for a newborn at night	3.00 (4.00)	2.00	3.00	1.091	.275	4.00	1.00	4.595	<.001
		5.00	4.00			4.00	4.00		
		89.16	97.78			112.09	76.10		
Anxiety of newborn crying	2.00 (4.00)	2.00	2.00	1.265	.206	4.00	2.00	4.399	<.001
		5.00	4.50			5.00	3.00		
		88.39	98.38			111.33	76.86		
Anxiety of getting COVID-19	3.00 (6.00)	2.00	3.00	1.081	.280	2.00	4.00	0.809	.419
		4.00	5.50			5.00	7.00		
		89.23	97.73			90.83	97.14		

Abbreviations: AAQ-2, Acceptance and Action Questionnaire-2; HADS-A, Hospital Anxiety and Depression Scale - Anxiety; IQR, interquartile range; NRS, Numerical Rating Scale for pain; NRS-A, Numerical Rating Scale for anxiety; STAI, State-Trait Anxiety Inventory; U(Z), Mann-Whitney U test.

Table 3. Comparison of Psychological Flexibility, Anxiety, and Pain Between Women at Low and High Risk of Developing an Anxiety Disorder (N = 187)

	Women at Low Risk (n = 149)		Women at High Risk (n = 38)			
Questionnaire	**Median**	**Mean Rank**	**Median**	**Mean Rank**	***U(Z)***	***P* Value**
AAQ-2	15.00	86.91	19.50	121.79	3.550	<.0001
STAI-T	36.00	86.77	41.50	122.36	3.622	<.0001
STAI-S	40.00	80.21	58.00	148.07	6.902	<.0001
NRS-A	3.00	79.56	7.00	150.61	7.276	<.0001
HADS-A	5.00	75.00	12.5	168.50	9.537	<.0001
Anxiety of self-care for a newborn during the day	1.00	82.16	5.00	138.63	5.789	<.0001
Anxiety of self-care for a newborn at night	2.00	82.16	6.00	140.43	5.988	<.0001
Anxiety of newborn crying	2.00	83.23	6.00	136.22	5.443	<.0001
Anxiety of getting COVID-19	2.00	92.16	4.00	101.20	0.932	.352
NRS	3.00	88.09	4.00	117.17	2.994	.003

Abbreviations: AAQ-2, Acceptance and Action Questionnaire-2; HADS-A, Hospital Anxiety and Depression Scale-Anxiety; NRS, Numerical Rating Scale for pain; NRS-A, Numerical Rating Scale for anxiety; STAI, State-Trait Anxiety Inventory; U(Z), Mann-Whitney *U* test.

Table 4. Correlations Among Scores of AAQ-2, NRS, and Anxiety Scales in Women in the Rooming-in Unit (N = 187)

Questionnaire	***AAQ- 2***	***P* Value**	**NRS**	***P* Value**	***STAI- T***	***P* Value**
HADS-A	0.443	<.001	0.351	<.001	0.448	<.001
STAI-T	0.659	<.001	0.156	.033	1.000	-
AAQ-2	1.000	-	0.168	.022	0.659	<.001
STAI-S	0.274	<.001	0.359	<.001	0.419	<.001
NRS-A	0.312	<.001	0.545	<.001	0.367	<.001
NRS	0.168	.022	1.000	-	0.156	.033
Anxiety of self-care for a newborn during the day	0.233	.001	0.491	<.001	0.315	<.001
Anxiety of self-care for a newborn at night	0.287	<.001	0.479	<.001	0.329	<.001
Anxiety of newborn crying	0.317	<.001	0.404	<.001	0.340	<.001
Anxiety of getting COVID-19	0.206	.005	0.296	<.001	0.181	.013

Abbreviations: AAQ-2, Acceptance and Action Questionnaire-2; HADS-A, Hospital Anxiety and Depression Scale-Anxiety; NRS, Numerical Rating Scale for pain; NRS-A, Numerical Rating Scale for anxiety; STAI, State-Trait Anxiety Inventory.

surgery and concluded that this simple tool is useful for detecting the postoperative pain component.[50] We did not identify any recent studies comparing pain and anxiety on the second postpartum day (48 hours) in patients after CB versus VB. The obtained knowledge may, however, complement the study by Lai et al[51] showing that patients in a rooming-in ward (48-72 hours) after CB versus VB had a significantly higher level of fatigue ($P < .01$). Other studies showed that even at the end of the postpartum period, patients after CB had a considerably worse physical health condition, including greater pain, than patients after VB.[52–54]

According to our findings, the levels of pain and anxiety on the STAI-S, NRS-A, HADS-A, and the anxiety of self-care for a newborn and newborn crying scales were higher in primiparous women than in multiparous women. This is in line with other studies that show that being a mother for the first time is associated with enormous stress and perceived anxiety.[55–57] Copeland and Harbaugh[55] emphasized they wanted to describe a phenomenon that is not related to psychopathology but is a normal transition state experienced by most women after giving birth to their first child. The study by Hung[58] showed that primiparous and multiparous women did not differ in terms of mental health. In contrast, primiparous women experienced greater postpartum stress related to their new role as a mother. Similarly, in our study, the participants were healthy women, after giving birth to a healthy newborn, with no psychiatric history. However, giving birth to the first child increased anxiety as a state related to motherhood, which was not observed in multiparous women. The primiparous women also had a higher level of anxiety on the HADS-A scale compared with multiparous women. However, the median value of anxiety in this group was 8, which is

Table 5. One-Way Logistic Regression Analysis to Predict Anxiety Disorder Risk (N = 187)

Questionnaire	B (SE)	R^2	Wald Statistic	*P* Value	OR (95% CI)
STAI-T	0.107 (0.028)	0.138	14.591	<.0001	1.113 (1.053-1.176)
AAQ-2	0.098 (0.026)	0.131	14.497	<.0001	1.103 (1.049-1.160)
STAI-S	0.139 (0.023)	0.449	36.195	<.0001	1.149 (1.098-1.203)
NRS-A	0.671 (0.106)	0.467	39.806	<.0001	1.957 (1.588-2.411)
NRS	0.222 (0.093)	0.048	5.617	.018	1.248 (1.039-1.499)
Anxiety of self-care for a newborn during the day	0.437 (0.080)	0.290	29.547	<.0001	1.548 (1.323-1.813)
Anxiety of self-care for a newborn during at night	0.357(0.065)	0.275	29.808	<.0001	1.429 (1.257-1.625)
Anxiety of newborn crying	0.347 (0.066)	0.255	27.957	<.0001	1.415 (1.244-1.610)
Anxiety of getting COVID-19	0.041 (0.052)	0.005	0.614	.433	1.042 (0.941-1.153)

Abbreviations: AAQ-2, Acceptance and Action Questionnaire-2; B(SE), beta(standard error); HADS-A, Hospital Anxiety and Depression Scale-Anxiety; NRS, Numerical Rating Scale for pain; NRS-A, Numerical Rating Scale for Anxiety; OR, odds ratio; STAI, State-Trait Anxiety Inventory.

below the cutoff point for a high risk of anxiety disorders (value of 10).

On the other hand, 20.3% of our study sample were at high risk of developing anxiety disorders, with a level of anxiety of above 10 on the HAD-A. A similar result was obtained in another study conducted several years before the pandemic, in which the incidence of perinatal anxiety was estimated at approximately 22%.[20] Studies conducted among pregnant women during the pandemic showed the prevalence of anxiety of approximately 17%.[59,60] The comparison of patients at low and high risk of developing an anxiety disorder in our study revealed that these groups differed not only in the levels of most anxieties but also in the levels of PF and pain. Differences related to specific motherhood anxieties were significant, whereas the difference related to the anxiety of getting COVID-19 was not significant. Perhaps the risk of an anxiety disorder in the puerperium is linked primarily to the specific perinatal situation of mothers. The COVID-19 pandemic was a stress factor for populations in various countries.[30,61,62] In Poland, at that time, women with their newborns constituted a homogeneous group with respect to fear of acquiring COVID-19.[63,64]

We also observed that women at high risk of developing an anxiety disorder had higher levels of other anxieties, including the anxiety of a newborn crying, than patients at low risk. Anxiety and frustration in women after childbirth may be related to the fact that they cannot determine why their newborns are crying and to the lack of the ability to calm the newborn, and this, in turn, may disrupt the early bond between the woman and her newborn.[51] Additionally in our study, primiparous women versus multiparous women and patients at high risk of developing an anxiety disorder versus those at low risk presented with a higher level of anxiety of self-care for their newborn. Women after childbirth from the study of Consales et al[65] described a night alone with a newborn in a hospital room as the worst rooming-in experience.

The levels of dispositional trait anxiety and PF did not differ by birth mode and parity, but they did in terms of a risk of developing an anxiety disorder. Reports from the literature consistently show the relationship between high anxiety as a trait and the risk of developing an anxiety disorder in adults.[66,67] This result is also in line with studies that present PF as a factor strongly associated with mental health.[30,45,68] AAQ-2 correlated with trait anxiety (STAI-T) and hospital anxiety (HADS-A) with similar strength. Additionally, AAQ-2 and trait anxiety (STAI-T) very similarly explain the risk of anxiety disorder in women postpartum,[46] which is due to a strong positive correlation between PF[45] and trait anxiety ($\rho = 0.659$; $P < .001$). The above result of our study is similar, although slightly lower, than in the study on the Polish general population ($r = 0.78$; $P < .001$).[46] It is also similar to the correlation between the AAQ-2 and General Anxiety Disorder questionnaire scores as a measure of generalized anxiety ($\rho = 0.66$; $P < .001$) in the study reporting that PF can be a measure of mental resilience in the context of COVID-19.[69]

The strength of the relationship between AAQ-2 and HADS-A ($\rho = 0.443$; $P < .001$) in our study was weaker than the strength of the relationship between AAQ-2 and HADS-A ($\rho = 0.643$; $P < .001$) in a study in which half of the studied people had cancer.[70] That study reported a significantly lower mean level of PF (AAQ-2) in patients without cancer than in patients with cancer (14.17 vs 20.63, respectively). In our study, a similar difference was shown between patients at low risk of developing anxiety disorder and those at high risk of developing anxiety disorder (median, 15.00 vs 19.50, respectively).

In addition, PI was positively related to all anxieties and to the pain of postpartum women staying in our rooming-in unit during the pandemic. Our study is the first to show an association of PI with acute pain in the puerperium. This relationship is significant, although the correlation is weak ($\rho = 0.168$; $P < .05$). So far, PF exhibited a protective role in people with chronic pain.[31,34,71] For example, in the study of Yu et al,[31] the correlation between PF, measured with a tool other than AAQ-2, and the intensity of chronic pain was significant ($r = -0.24$; $P < .001$), whereas the correlation between PF and anxiety of COVID-19 had a similar strength ($r = 0.15$-0.30; $P < .001$) as in our study ($\rho = 0.21$; $P < .001$).

Our study was the first to show that low PF (PI) measured by AAQ-2 may have a predictive value for the risk of anxiety disorders during the puerperium. To the best of our knowledge, there are no studies to date that analyze the AAQ-2 cutoff point for women in the puerperium. The cutoff point of the AAQ-2 score could be used as a reference to the initial identification of outcomes associated with a significant experience avoidance index that influences the risk of anxiety disorders among patients after birth. However, because of

the low specificity values in the ROC analysis and the small number of women being at high risk of developing an anxiety disorder, the cutoff point of 14.50 on AAQ-2 should be treated as a preliminary result that requires verification in a larger population. The obtained results encourage further research on the mindful acceptance of anxiety in the puerperium. Designing preventive and intervention measures aimed at increasing PF may improve the mental condition of women after childbirth.

Several limitations of our study have to be mentioned. First, we used a single diagnostic tool to measure PF. This was because women in the puerperium are tired and burdened with caring for the newborn. It was difficult for them to complete several questionnaires at the same time. Thus, we chose a representative tool to measure the avoidance of difficult emotions.[45] AAQ-2 has been recognized for its high internal consistency and reliability in various types of psychopathological diseases and is widely used in various target groups.[72–76] The second limitation is the single-center design. On the other hand, the strength of the study lies in investigating anxiety in healthy women who gave birth to healthy newborns during the COVID-19 pandemic and who stayed in the rooming-in unit during their puerperium. All patients were in the same situation regarding self-care for the newborn, without the support of their relatives. Despite those limitation, the results of the present research can be generalized to countries with a similar culture and a similar organization of maternity units operating in the rooming-in system. The results encourage further research on anxiety and its relationship with PF in the puerperium in other clinical centers and in the populations of women who gave birth to newborns requiring specialized treatment. This particularly applies to situations in which a woman does not have support from relatives.

CONCLUSION

PF is an important psychological construct related to the mental and physical condition of women after childbirth. Thus, increasing PF in women after childbirth may be considered as an important goal of preventive and intervention measures. The staff of obstetric wards operating in the rooming-in system should routinely monitor the mental condition of women after childbirth, in addition to pain, and provide additional support to women who are first-time mothers.

CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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VIII. Podsumowanie wyników

W niniejszym rozdziale omówiono krótko artykuły stanowiące podstawę rozprawy doktorskiej.

Część 1

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Health in the context of psychological flexibility and acceptance and commitment therapy, *Medical Research Journal, 2021, vol. 6, nr 3, s. 249-253*, DOI:10.5603/MRJ.a2021.0032

Uzyskane dane z przeglądu badań wskazują, iż wyższe zasoby EP pomagają jednostce prowadzić bogate, wartościowe życie, pomimo dolegliwości związanych z doświadczaniem bólu przewlekłego, zoperacjonalizowane jako częstsze korzystanie z opieki zdrowotnej, częstsze podejmowanie pracy oraz stosowanie mniejszych ilości opioidów. Różne miary EP okazały się również istotnymi mediatorami wyniku leczenia terapeutycznego u pacjentów z bólem przewlekłym. Wyższe wyniki EP były wiarygodnymi predyktorami zdrowia psychicznego (niższego lęku oraz poziomu depresji) u homoseksualnych mężczyzn poddających się badaniom przesiewowym w kierunku ryzyka nowotworu odbytu.

Wykazano, że niższa EP w populacji amerykańskich i tureckich studentów była powiązana z wyższymi poziomami depresji i lęku. Zgłaszany przez finlandzkich studentów lęk przed wystąpieniami publicznymi koreluje z niższą EP w obszarach z otwartością na doświadczanie i wyższą fuzją poznawczą. Kilka badań przeprowadzonych podczas izolacji związanej z pandemią COVID-19, na różnych populacjach, wykazało, że wyższa EP ma związek z lepszym funkcjonowaniem jednostki w sferze psychicznej, fizycznej i społecznej. Mocną stroną EP jest możliwość jej rozwijania i wzmacniania w ramach Terapii Akceptacji i Zaangażowania, co w konsekwencji, jak pokazały badania, może pozytywnie wpłynąć na wszystkie obszary zdrowia jednostki.

Część 2

Prokopowicz Anna, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, *Ginekologia Polska, 2022, vol. 93, nr 9, s. 686-694*, DOI:10.5603/gp.a2021.0197

Analiza uzyskanych wyników wskazuje na dodatnie i wysokie ($p < 0,001$) korelacje pomiędzy STAI-S a NRS-A w obu pomiarach. Wyniosły one kolejno: w T1 rho = 0,807, w T2 rho = 0,778. Wykazano korelacje o porównywalnej sile pomiędzy pomiarami zależnymi (T1 z T2) obliczone osobno dla NRS-A (rho = 0,708; $p < 0,001$) oraz dla STAI-S (rho = 0,701; $p < 0,001$).

Dodatnie związki pomiarów STAI-T z NRS-A i STAI-S oraz HADS-A z NRS-A i STAI-S mają zbliżoną siłę i istotność ($p < 0,001$) dla obu skal. Powyższe wyniki wskazują na wysoką trafność zbieżną między narzędziami NRS-S i STAI-S. Wynik w badaniu własnym jest wyższy niż uzyskany w grupie dorosłych pacjentów stomatologicznych oraz w grupie pacjentów pediatrycznych[9,10].

Dodatkowo analiza krzywej ROC dla 200 pacjentek sugerowała wartość 3,5/10 na skali NRS-A jako próg dla wysokiego lęku (zdefiniowany za pomocą referencyjnego punktu odcięcia na STAI-S równego 40) w obu pomiarach (w T1 AUC = 0,886; $p < 0,001$ oraz w T2 AUC = 0,860; $p < 0,001$).

Analiza krzywej ROC dla 187 pacjentek sugerowała wartość 4,5/10 na skali NRS-A dla T1 i T2 (dla STAI-S wartość 42,5/80 w T1 oraz 50,5/80 w T2) jako próg wskazania ryzyka zaburzenia lękowego (zdefiniowany za pomocą referencyjnego punktu odcięcia na HADS-A równego 10).

Innowacyjne wprowadzenie podziału na pacjentki zgłaszające potrzebę wsparcia emocjonalnego lub brak takiej potrzeby w badaniu własnym umożliwiło ocenę poziomów lęku w tych grupach na obu skalach (NRS-A oraz STAI-S). Biorąc pod uwagę obie doby połogu potrzebę wsparcia emocjonalnego deklarowała blisko połowa pacjentek. Z grupy 200 pacjentek potrzebę wsparcia emocjonalnego zadeklarowało w pierwszej dobie (T1) 101 (50,5%), a w dobie drugiej (T2) 96 (48,0%) pacjentek. W obu pomiarach na skali NRS-A, jak i na skali STAI-S, wykazano wyższy ($p < 0,001$) poziom lęku w grupie kobiet deklarujących potrzebę wsparcia emocjonalnego w stosunku do grupy kobiet nie deklarujących potrzeby wsparcia emocjonalnego. Przebadana pod względem trafności i rzetelności skala NRS-A może ułatwić monitorowanie poziomu lęku u kobiet w połogu w celu udzielenia wsparcia emocjonalnego położnicom z wysokim lękiem.

Część 3

Prokopowicz, A.; Stanczykiewicz, B.; Uchmanowicz, I. Anxiety and psychological flexibility in women after childbirth in the rooming-in unit during the COVID-19 pandemic, *Journal of Midwifery and Women's Health* 2022 Dec 24. doi: 10.1111/jmwh.13445. Epub ahead of print.

W badaniu po raz pierwszy podjęto próbę określenia związku pomiędzy elastycznością psychologiczną a występowaniem lęku u kobiet po porodzie. Wykazano, że niska EP ma związek z wyższym lękiem. Dodatkowo wykazano, że niska EP mierzona AAQ-2 może mieć wartość predykcyjną dla wykrycia ryzyka zaburzeń lękowych w połogu.
Z grupy 187 położnic 79,7% (149 kobiet) miało niski poziom ryzyka zaburzeń lękowych (HADS-A-1). a 20,3% (38 kobiet) wysokie ryzyko zaburzeń lękowych (HADS-A-2). Wynik ten jest zbliżony do danych z innych publikacji dotyczących lęku okołoporodowego[22-24]. Porównanie grupy HADS-A-2 z grupą HADS-A-1 w badaniu własnym pokazało dodatkowo, że obie grupy różnią się między sobą poziomami EP, bólu oraz większości lęków. Należy jednak zauważyć, że istotną różnicę w tych grupach wykazano w specyficznych poziomach lęku związanych z macierzyństwem, a nie w lęku przed zachorowaniem na COVID-19. Być może ryzyko zaburzenia lękowego w połogu ma związek przede wszystkim ze specyficzną sytuacją okołoporodową matek. Wyższy poziom lęku przed samodzielną opieką nad noworodkiem miały także pierwiastki w porównaniu do wieloródek ($p < 0,05$).

Kolejnym etapem analiz było obliczenie predykcji ryzyka zaburzenia lękowego za pomocą pojedynczych zmiennych objaśniających, takich jak: niska EP, lęk (mierzony innymi kwestionariuszami od HADS-A) oraz ból. Jednoczynnikowa regresja logistyczna wykazała, że największy procent wariancji ryzyka zaburzenia lękowego spośród wszystkich lęków wyjaśnia lęk jako stan (46,7% mierzony NRS-A oraz 44,9% mierzony STAI-S). Kwestionariusz STAI-T (jego wyższe wyniki stanowią o wyższym lęku jako cesze) wyjaśnia zbliżony procent wariancji (13,8%) ryzyka zaburzenia lękowego u kobiet po porodzie do AAQ-2 (jego wyższe wyniki stanowią o niższej EP) (13,1%). Innymi słowy wykazano, że kwestionariusz unikania doświadczania AAQ-2 oraz kwestionariusz dla lęku cechy STAI-T bardzo podobnie objaśniają ryzyko zaburzenia lękowego u kobiet w połogu.

Wykazano, że kwestionariusz AAQ-2 dodatnio korelował z numeryczną skalą bólu oraz ze wszystkimi kwestionariuszami do oceny lęku. Najsilniej AAQ-2 korelowało ze STAI-T ($rho = 0,659$; $p < 0,001$). Wynik powyższy był zbliżony, choć nieco niższy niż w badaniu na polskiej ogólnej populacji ($r = 0,78$; $p < 0,001$), przeprowadzonym podczas

polskiej adaptacji AAQ-2[16] oraz podobny do związku AAQ-2 z kwestionariuszem GAD (ang. General Anxiety Disorder) jako miarą lęku uogólnionego (rho = 0,66; p < 0,001)[25]. Uzyskane wyniki zachęcają do dalszej ścieżki badań nad lękiem i jego związkiem z elastycznością psychologiczną w połogu w innych ośrodkach klinicznych oraz w populacjach kobiet, które urodziły noworodki wymagające specjalistycznego leczenia. Zaprojektowanie działań profilaktycznych i interwencyjnych ukierunkowanych na zwiększenie elastyczności psychologicznej może wpłynąć na poprawę kondycji psychicznej kobiet po porodzie.

IX. Wnioski

1. Dane z przeglądu badań ukazują, że wyższa elastyczność psychologiczna jest związana z niższym lękiem i depresją, a także z lepszym funkcjonowaniem osób z bólem przewlekłym oraz stresem wywołanym pandemią COVID-19 w różnych populacjach.
2. Elastyczność psychologiczna jest istotnym konstruktem psychologicznym mającym związek z kondycją psychiczną i fizyczną położnic.
3. Kwestionariusz unikania doświadczania AAQ-2 oraz kwestionariusz lęku jako cechy STAI-T objaśniają w ok. 13% ryzyko zaburzenia lękowego u kobiet w połogu.
4. NRS-A jest trafnym i rzetelnym narzędziem do pomiaru lęku jako stanu u położnic. Oszacowano wartość 3,5/10 na skali NRS-A jako próg wskazania wysokiego lęku u kobiet po porodzie. NRS-A objaśnia w 47% ryzyko zaburzenia lękowego u kobiet w połogu.
5. Rutynowy pomiar lęku numeryczną skalą może być wykorzystany do identyfikacji pacjentek z wysokim lękiem w celu udzielenia im wsparcia emocjonalnego we wczesnym połogu.
6. Szczególne wsparcie należy zapewnić kobietom, które zostały po raz pierwszy matkami.
7. Wyniki przeprowadzonych badań mogą być przydatne do rozwoju ścieżki badań nad normalizacją lęku oraz nad zwiększeniem elastyczności psychologicznej u kobiet po porodzie.

X. Piśmiennictwo

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Chongqing during the COVID-19 outbreak: a cross-sectional study. *Bjog* 2020;127:1229-1240. doi: 10.1111/1471-0528.16381

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XI. Załączniki

1. Oświadczenia współautorów prac

Wrocław, dn. 30.12.2022 r.

Prof. dr hab. Izabella Uchmanowicz
Zakład Pielęgniarstwa Internistycznego
Katedra Pielęgniarstwa i Położnictwa
Uniwersytet Medyczny we Wrocławiu

Oświadczenie

Oświadczam, że w pracy: *Prokopowicz, A.; Stańczykiewicz, B.; Uchmanowicz, I. Health in the context of psychological flexibility and acceptance and commitment therapy, Medical Research Journal 2021, 6, 249-253. doi: 10.5603/MRJ.a2021.0032* , brałam udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
KATEDRA PIELĘGNIARSTWA
I POŁOŻNICTWA
kierownik

prof. dr hab. Izabella Uchmanowicz

Oświadczam, że w pracy: *Prokopowicz, A.; Stanczykiewicz, B.; Uchmanowicz, I. Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, Ginekol Pol 2022, 93, 686-694. doi: 10.5603/GP.a2021.0197* , brałam udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
KATEDRA PIELĘGNIARSTWA
I POŁOŻNICTWA
kierownik

prof. dr hab. Izabella Uchmanowicz

Oświadczam, że w pracy: *Prokopowicz, A., Stańczykiewicz, B. and Uchmanowicz, I. (2022), Anxiety and Psychological Flexibility in Women After Childbirth in the Rooming-in Unit during the COVID-19 Pandemic. J Midwifery Womens Health.. https://doi.org/10.1111/jmwh.13445*, brałam udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
KATEDRA PIELĘGNIARSTWA
I POŁOŻNICTWA
kierownik

prof. dr hab. Izabella Uchmanowicz

Wrocław, dn. 29.12.2022 r.

Dr Bartłomiej Stańczykiewicz, prof. uczelni
Zakład Psychiatrii Konsultacyjnej i Badań Neurobiologicznych
Katedra Psychiatrii
Uniwersytet Medyczny we Wrocławiu

Oświadczenie

Oświadczam, że w pracy: *Prokopowicz, A.; Stańczykiewicz, B.; Uchmanowicz, I. Health in the context of psychological flexibility and acceptance and commitment therapy, Medical Research Journal 2021, 6, 249-253. doi: 10.5603/MRJ.a2021.0032*, brałem udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
Katedra Psychiatrii
ZAKŁAD PSYCHIATRII KONSULTACYJNEJ
I BADAŃ NEUROBIOLOGICZNYCH
dr Bartłomiej Stańczykiewicz, profesor uczelni

Oświadczam, że w pracy: *Prokopowicz, A.; Stanczykiewicz, B.; Uchmanowicz, I. Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, Ginekol Pol 2022, 93, 686-694. doi: 10.5603/GP.a2021.0197* , brałem udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
Katedra Psychiatrii
ZAKŁAD PSYCHIATRII KONSULTACYJNEJ
I BADAŃ NEUROBIOLOGICZNYCH
dr Bartłomiej Stańczykiewicz, profesor uczelni

Oświadczam, że w pracy: *Prokopowicz, A., Stańczykiewicz, B. and Uchmanowicz, I. (2022), Anxiety and Psychological Flexibility in Women After Childbirth in the Rooming-in Unit during the COVID-19 Pandemic. J Midwifery Womens Health.. https://doi.org/10.1111/jmwh.13445*, brałem udział w opracowaniu koncepcji badania, pomocy w analizie danych oraz w korekcie manuskryptu.

Uniwersytet Medyczny we Wrocławiu
Katedra Psychiatrii
ZAKŁAD PSYCHIATRII KONSULTACYJNEJ
I BADAŃ NEUROBIOLOGICZNYCH
dr Bartłomiej Stańczykiewicz, profesor uczelni

2. Nota biograficzna

Anna Prokopowicz urodziła się w 1970 roku. Dyplom położnej uzyskała w 1993 roku. W 2012 roku ukończyła studia magisterskie na kierunku Położnictwo na Wydziale Nauk o Zdrowiu UM we Wrocławiu. W 2013 uzyskała tytuł specjalisty w dziedzinie pielęgniarstwa położniczego. W roku 2019 ukończyła Psychologię, a w 2020 Interwencję Kryzysową na Uniwersytecie SWPS we Wrocławiu. Obecnie studiuje tamże w podyplomowej Szkole Terapii Poznawczo-Behawioralnej.

Zawodowo od 27 lat związana jest z II Kliniką Ginekologii i Położnictwa w USK we Wrocławiu, gdzie obecnie pracuje na stanowisku Starszego Asystenta. Od 2019 roku zatrudniona jest na stanowisku Asystenta Dydaktycznego w Zakładzie Położnictwa i Pielęgniarstwa Ginekologiczno-Położniczego, w Katedrze Pielęgniarstwa i Położnictwa, na Uniwersytecie Medycznym im. Piastów Śląskich we Wrocławiu. W roku akademickim 2022/2023 prowadzi zajęcia praktyczne w II Klinice Ginekologii i Położnictwa ze studentami kierunków: Położnictwo oraz Pielęgniarstwo. Prowadzi również wykłady oraz ćwiczenia audytoryjne z przedmiotu Praktyka położnicza w perspektywie międzynarodowej, którego jest koordynatorem. Kwalifikacje psychologa, interwenta kryzysowego i psychoterapeuty wykorzystuje w pracy z pacjentami cierpiącymi na zaburzenia lękowo – depresyjne.

Ścieżkę naukową Anna Prokopowicz rozpoczęła w 2019, kierując się potrzebą prowadzenia badań nad emocjami w ochronie zdrowia. Jej łączny dorobek naukowy na koniec 2022 roku wyniósł: 750 punktów ministerialnych oraz 20,825 Impact Factor. Wiedzę naukową propaguje biorąc czynny udział w konferencjach oraz prowadząc szkolenia dla personelu oddziału położniczego. Aktualnie zatrudniona jest również w projekcie badawczym: „Łagodne zaburzenia poznawcze w niewydolności serca: rola czynników sercowo-naczyniowych i zespołu kruchości" (Grant OPUS-21).

Jest także członkiem Polskiego Towarzystwa Położnych w regionie dolnośląskim.

3. Wykaz publikacji autora

Wykaz publikacji

Anna Prokopowicz

1. Publikacje w czasopismach naukowych

1.1 Publikacje w czasopiśmie z IF

Lp	Opis bibliograficzny	IF	Punkty
1	**Prokopowicz Anna**, Korzeniewska Aleksandra, Byrka Katarzyna: Patient anxiety of verticalization on day 0 after a Cesarean section, Archives of Gynecology and Obstetrics, 2021, vol. 303, nr 2, s. 391-399, DOI:10.1007/s00404-020-05748-3	2,493	70
2	Larysz Anna, **Prokopowicz Anna** , Zakliczyński Michał, Uchmanowicz Izabella: Occurrence of professional burnout and severity of depressive symptoms among cardiac nurses: a cross-sectional study, International Journal of Environmental Research and Public Health, 2021, vol. 18, nr 22, art.12038 [11 s.], DOI:10.3390/ijerph182212038	4,614	140
3	**Prokopowicz Anna**, Byrka Katarzyna: Effectiveness of mental simulations on the early mobilization of patients after cesarean section: a randomized controlled trial, Scientific Reports, 2021, vol. 11, art.22634 [8 s.], DOI:10.1038/s41598-021-02036-1	4,997	140
4	**Prokopowicz Anna**, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Validation of the Numerical Anxiety Rating Scale in postpartum females: a prospective observational study, Ginekologia Polska, 2022, vol. 93, nr 9, s. 686-694, DOI:10.5603/gp.a2021.0197	1,216*	40
5	**Prokopowicz Anna**, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella, Zimmer Mariusz: How to improve the care of women after childbirth in the rooming-in unit: a prospective observational study, International Journal of Environmental Research and Public Health, 2022, vol. 19, nr 23, art.16117 [10 s.], DOI:10.3390/ijerph192316117	4,614*	140
6	**Prokopowicz A[nna],** Stańczykiewicz B, Uchmanowicz I. Anxiety and Psychological Flexibility in Women After Childbirth in the Rooming-in Unit during the COVID-19 Pandemic. Journal of Midwifery & Women's Health 2022 Dec 24. doi: 10.1111/jmwh.13445. *Epub ahead of print.*	2,891*	100
	Podsumowanie	20,825	630

**IF 2021*

1.2 Publikacje w czasopiśmie bez IF

Lp	Opis bibliograficzny	Punkty
1	**Prokopowicz Anna**, Stańczykiewicz Bartłomiej, Uchmanowicz Izabella: Health in the context of psychological flexibility and acceptance and commitment therapy, Medical Research Journal, 2021, vol. 6, nr 3, s. 249-253, DOI:10.5603/MRJ.a2021.0032	100
	Podsumowanie	100

2. Monografie naukowe

2.1 Książka autorska -

2.2 Książka redagowana –

2.3 Rozdziały

Lp	Opis bibliograficzny	Punkty
1	**Prokopowicz Anna**: Psychologiczna perspektywa kobiety po narodzinach dziecka z wadą genetyczną, W: Badania naukowe w pielęgniarstwie i położnictwie. T.8, (red.) Izabella Uchmanowicz, Monika Przestrzelska, Piotr Jerzy Gurowiec, Wrocław 2020, Wydawnictwo Continuo, s. 386-393, ISBN 978-83-62182-88-6	20
	Podsumowanie	20

3. Abstrakty

Lp	Opis bibliograficzny
1	Larysz Anna, **Prokopowicz Anna**, Zakliczyński Michał, Uchmanowicz Izabella: Occurrence of professional burnout and severity of depressive symptoms among cardiac nurses: a prospective and observational study, European Journal of Cardiovascular Nursing, 2021, vol. 20, nr suppl.1, 152 poz.zvab060.145, [EuroHeartCare ACNAP Congress 2021. Online Congress, 18-19 June, 2021], DOI:10.1093/eurjcn/zvab060.145

Impact Factor: 20,825

Punkty ministerialne: 750,0

30.12.2022 Beata Magerska

Uniwersytet Medyczny we Wrocławiu
Biblioteka Główna
DZIAŁ BIBLIOGRAFII I BIBLIOMETRII
ul. Marcinkowskiego 2-6, 50-368 Wrocław
tel. 71 784 19 25, faks 71 784 19 31

4. Zgoda Komisji Bioetycznej

KOMISJA BIOETYCZNA
przy
Uniwersytecie Medycznym
we Wrocławiu
ul. Pasteura 1; 50-367 WROCŁAW

OPINIA KOMISJI BIOETYCZNEJ Nr KB – 747/2020

Komisja Bioetyczna przy Uniwersytecie Medycznym we Wrocławiu, powołana zarządzeniem Rektora Uniwersytetu Medycznego we Wrocławiu nr 133/XV R/2017 z dnia 21 grudnia 2017 r. oraz działająca w trybie przewidzianym rozporządzeniem Ministra Zdrowia i Opieki Społecznej z dnia 11 maja 1999 r. (Dz.U. nr 47, poz. 480) na podstawie ustawy o zawodzie lekarza z dnia 5 grudnia 1996 r. (Dz.U. nr 28 z 1997 r. poz. 152 z późniejszymi zmianami) w składzie:

prof. dr hab. Jacek Daroszewski (choroby wewnętrzne, endokrynologia, diabetologia)
prof. dr hab. Krzysztof Grabowski (chirurgia)
dr Henryk Kaczkowski (chirurgia szczękowa, chirurgia stomatologiczna)
mgr Irena Knabel-Krzyszowska (farmacja)
prof. dr hab. Jerzy Liebhart (choroby wewnętrzne, alergologia)
ks. dr hab. Piotr Mrzygłód, prof. nadzw. (duchowny)
mgr Luiza Műller (prawo)
dr hab. Sławomir Sidorowicz (psychiatria)
prof. dr hab. Leszek Szenborn, (pediatria, choroby zakaźne)
Danuta Tarkowska (pielęgniarstwo)
prof. dr hab. Anna Wiela-Hojeńska (farmakologia kliniczna)
dr hab. Andrzej Wojnar, prof. nadzw. (histopatologia, dermatologia) przedstawiciel Dolnośląskiej Izby Lekarskiej)
dr hab. Jacek Zieliński (filozofia)

pod przewodnictwem
prof. dr hab. Jana Kornafela (ginekologia i położnictwo, onkologia)

Przestrzegając w działalności zasad Good Clinical Practice oraz zasad Deklaracji Helsińskiej, po zapoznaniu się z projektem badawczym pt.

„Ocena poziomu lęku w kontekście elastyczności psychologicznej w praktyce położniczej"

zgłoszonym przez **mgr położnictwa, mgr psychologii Annę Prokopowicz** zatrudnioną w Zakładzie Położnictwa Praktycznego Katedry Ginekologii i Położnictwa Wydziału Nauk o Zdrowiu Uniwersytetu Medycznego we Wrocławiu oraz złożonymi wraz z wnioskiem dokumentami, w tajnym głosowaniu postanowiła wyrazić zgodę na przeprowadzenie badania w Klinice Ginekologii i Położnictwa Uniwersyteckiego Szpitala Klinicznego im. Jana Mikulicza-Radeckiego we Wrocławiu pod nadzorem prof. dr hab. Izabelli Uchmanowicz **pod warunkiem zachowania anonimowości uzyskanych danych**.

Uwaga: Badanie to zostało objęte ubezpieczeniem odpowiedzialności cywilnej Uniwersytetu Medycznego we Wrocławiu z tytułu prowadzonej działalności:

Pouczenie: W ciągu 14 dni od otrzymania decyzji wnioskodawcy przysługuje prawo odwołania do Komisji Odwoławczej za pośrednictwem Komisji Bioetycznej UM we Wrocławiu

Opinia powyższa dotyczy: projektu badawczego będącego podstawą rozprawy doktorskiej

Wrocław, dnia 26 listopada 2020 r.

BW

Uniwersytet Medyczny we Wrocławiu
KOMISJA BIOETYCZNA
przewodniczący
prof. dr hab. Jan Kornafel