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RODZICIELSKIE MODELOWANIE AKTYWNOŚCI FIZYCZNEJ I INNYCH ZACHOWAŃ PROZDROWOTNYCH U DZIECI W OKRESIE ŚREDNIEGO DZIECIŃSTWA

rozprawa doktorska

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WPROWADZENIE

Regularna aktywność fizyczna i zbilansowana dieta to najbardziej typowe zachowania prozdrowotne (WHO, 2020), co ma bezpośredni wpływ na kondycję i zdrowie organizmu, a także pośredni wpływ na zdrowie psychiczne i ogólne samopoczucie (Owen i Corfe, 2017) zarówno dzieci (Sen i in., 2020), jak i dorosłych (Rhodes i in., 2020). Z raportów Światowej Organizacji Zdrowia (WHO) wynika, że 1 na 4 dorosłych nie spełnia wymaganych zaleceń zdrowotnych związanych z czasem przeznaczonym na aktywność fizyczną (Wolnicka, 2020). Według zaleceń WHO dzieci i młodzież, aby zachować stan zdrowia, powinny uczestniczyć w codziennej (szczególnie aerobowej) aktywności fizycznej. Zgodnie ze standardami zdrowotnymi zalecany czas podejmowanej umiarkowanej lub wysokiej intensywności aktywności fizycznej to średnio 60 minut dziennie**.** Uszczegółowione normy poziomu aktywności fizycznej dla dzieci przedszkolnych zalecają nawet 180 minut dziennie, jednak bez określenia jej intensywności (Tomik i in., 2024). Zróżnicowana aktywność fizyczna korzystnie oddziałuje na poprawę jakości życia i zdrowia. Oznacza to, że zarówno osoby zdrowe, jak i pacjenci z problemami zdrowotnymi mogą znacząco poprawić własne zdrowie fizyczne i psychiczne oraz zmniejszyć poczucie bólu i ograniczeń związanych z niepełnosprawnością (Mok i in, 2019). W raportach analitycznych dotyczących populacji polskiej podkreśla się, iż ruch jest podstawowym bodźcem rozwojowym, który kształtuje organizm człowieka i jego funkcje na każdym etapie ontogenezy (Tomik i in, 2024)**.** Korzystne działanie zachowań prozdrowotnych w tym aktywności fizycznej zależy od regularności, rodzaju, intensywności oraz objętości wysiłku fizycznego (Herbert i in., 2022). Zgodnie z wytycznymi opracowanymi przez National Association for Sport and Physical Education (National Association for Sport and Physical Education, 2009) rodzice są zobowiązani do zachęcania swoich dzieci do korzystania z obiektów sportowo-rekreacyjnych zewnętrznych i wewnętrznych umożliwiających bezpieczne zabawy, ćwiczenia ruchowe o charakterze ogólnousprawniającym.

Uczestnictwo i zaangażowanie się dzieci w odpowiednią aktywność fizyczną niesie wiele korzyści biologicznych i psychospołecznych oraz rzutuje na późniejszą jakość dorosłego życia. Należy podkreślić, iż często proces choroby pojawiającej się w dorosłym życiu ma początek w młodości a nawet dzieciństwie. Wśród korzyści wynikającej z uczestnictwa w aktywności ruchowej w obszarze psychospołecznym należy wymienić: zwiększenie pewności siebie, poprawę samooceny, nabywanie i doskonalenie umiejętności społecznych, integrację z grupami

rówieśniczymi, a także poprawę stanu emocjonalnego (Biddle i in., 2011). Istotne jest, aby dzieci w wieku przedszkolnym regularnie były zachęcane do nauki nowych wzorców ruchowych, a ich rodzice stwarzali warunki do rozwoju podstawowych umiejętności motorycznych. Dodatkowo zaleca się ograniczenie korzystania z mediów od 30 do 60 minut dziennie (Tomik i in., 2024).

Sposób, w jaki dzieci spędzają wolny czas, zależy od zaangażowania rodziców w aktywność fizyczną oraz od ich nawyków zdrowotnych (Kluck, 2010; Slater i in., 2011). Podejmowanie prozdrowotnych zachowań dotyczących dziecięcej aktywności fizycznej wymaga obecnego w rozwoju dziecka rodzicielskiego modelowania. Rodzina, kształtując u dziecka od początku życia i procesu wychowania postawy wobec aktywności fizycznej, staje się również ważnym środowiskiem, które już w okresie dzieciństwa stymuluje zasady i standardy sprzyjające, bądź nie, zdrowiu publicznemu (Barnes i in., 2020). Środowisko rodzinne, a zwłaszcza rodzice, odgrywa ważną rolę w kształtowaniu fizycznej i społecznej organizacji środowiska dzieci w wieku 4–6 lat (WHO, 2020; Owen i Corfe, 2017). Obok istotnego środowiska rodzinnego, również przedszkole (Srismith i in., 2020; McComb i in., 2022) i szkoła (Gualdi-Russo i in., 2022, Guo i in., 2023; Lipowski i Lipowska, 2015) znacząco oddziałują na kształtowanie się postawy dziecka wobec podejmowanej przez nie aktywności fizycznej. Niemniej jednak zaangażowanie dzieci w aktywności ruchowe, szczególnie u dzieci w wieku przedszkolnym, jest w dużej mierze zależne od aktywności fizycznej ich dorosłych opiekunów.

Istnieje wyraźny, wymierny związek między aktywnością fizyczną rodziców i dzieci, a jakością ich czasu wolnego (Lipowski, 2006; Jakubowska, 2014). To rodzice, budując podstawowe środowisko wychowawczo-opiekuńcze dla dziecka, jednocześnie stwarzają warunki do zaangażowania się dziecka w różnorodne formy aktywności fizycznej (Boyd i Murnen, 2017).

Raporty epidemiologiczne z Europy, USA i innych części świata również podkreślają, że dzieci poświęcają mniej czasu na aktywność fizyczną (Amando, 2015). Siedzący tryb życia wśród pięcioletnich dzieci prowadzi do problemów z masą ciała i wpływa na jakość aktywności fizycznej. Coraz więcej dzieci jest otyłych lub ma nadwagę, co sprzyja zmniejszaniu ich aktywności fizycznej w codziennym życiu (Gentile i in., 2018). Brak zaangażowania rodzicielskiego jest barierą w podjęciu aktywności fizycznej zarówno jako działań profilaktycznych na rzecz zdrowia psychoruchowego dziecka przedszkolnego, jak i wsparcia procesu fizjoterapeutycznego i aktywizującego dzieci, także tych z różnorodnymi niepełnosprawnościami. Monitorowanie postaw rodzicielskich wobec modelowania

aktywności fizycznej jest istotne i potrzebne do identyfikacji fizycznych i psychologicznych barier uczestniczenia w aktywności ruchowej (Wright i in., 2019). Ważnym aspektem przy podejmowaniu interwencji i planowaniu aktywności fizycznej jest dostosowanie warunków zewnętrznych, jak również rozwojowych potrzeb dzieci. Obowiązek odpowiedniego dopasowania spoczywa na opiekunach zajmujących się swoimi dziećmi (Neshteruk i in., 2018).

Uważność rodziców skierowana na zaangażowanie i motywację do podejmowania aktywności ruchowej wśród dzieci (w tym dzieci przedszkolnych) jest istotnym elementem edukacji w profilaktyce zdrowia i działań fizjoterapeutycznych dla rodzin z dziećmi (Wright i in., 2019; Rhodes i in., 2020). Prezentowane przez rodziców zachowania zdrowotne (prozdrowotne i/albo antyzdrowotne) (Bassett-Gunter i in., 2017; Bois i in., 2005; Lipowski i in., 2021) maja znaczenie dla motywacji do podejmowania aktywności fizycznej przez dzieci.

Interesującym jest, że intensywność zaangażowania w aktywność fizyczną sama w sobie zwiększa zadowolenie z własnego wyglądu, niezależnie od obiektywnych parametrów, takich jak wskaźnik masy ciała (BMI) czy stosunek obwodu talii do wzrostu (WtHR) (Gualdi-Russo i in., 2022; Guo i in., 2023). Badania wskazują również, że zdrowotne zachowania kreowane w rodzinie są istotną częścią rozwoju dziecka (Lipowska i Lipowski, 2018) i jego przyszłych zachowań związanych z uczestnictwem i poziomem aktywności fizycznej w życiu dorosłym (Cheung, 2015; Leung i in., 2017; Tandon i in., 2017; Yilmaz i in., 2018).

Zarówno płeć rodzica, jak i dziecka w powiązaniu ze standardami aktywności fizycznej odgrywają ważną rolę w procesie międzypokoleniowego przekazywania standardów piękna ciała w powiązaniu ze standardami aktywności fizycznej (Haddad i in., 2018). Dzieci, w szczególności w wieku przedszkolnym, uważnie obserwują swoich opiekunów, zaczynają określać kształty ciała, jak również stwierdzać, czy są ładne, czy brzydkie. Postrzeganie przez dzieci tego, co stanowi piękno, jest kształtowane nie tylko przez wygląd fizyczny rodziców i ich opinie na temat ideałów piękna, lecz także przez ich zachowania związane z pielęgnacją ciała. Rodzice wyraźnie socjalizują swoje dzieci, ustanawiając normy dotyczące jedzenia, masy ciała, kształtu ciała oraz reakcji na stres (Haddad i in., 2018).

Istotnym i niekwestionowanym aspektem aktywności fizycznej jest wpływ na kształt ciała, np. poprzez zwiększenie masy mięśniowej u mężczyzn (Lipowski i Lipowska, 2015; Boyd i Murnen, 2017; Slater i in., 2011) czy chęć uzyskania i utrzymania szczupłej sylwetki ciała i zapobieganie otyłości u kobiet (Lipowski, 2006). W większości kultur chłopcy angażują się bardziej w sportowe zabawy niż dziewczęta (Amando i in., 2015; Boiché i in., 2014). Są również bardziej zmotywowani do uprawiania sportu (Dener i in., 2016) i uczestniczenia w zajęciach wychowania fizycznego (Fredricks i in., 2005).

Modelowanie aktywności fizycznej przez rodziców pozytywnie oddziałuje na zwiększenie częstotliwości jej podejmowanego w rodzinie. Przede wszystkim otaczające środowisko rodzinne i społeczne ma znaczenie dla aktywności fizycznej dzieci. W literaturze znaleźć można wiele badań dotyczących modelowania rodzicielskiego i przede wszystkim postrzegania zachowań zdrowotnych (w tym aktywności fizycznej) dziecka dokonywanego przez samych rodziców (Galaviz i in., 2016; Horodyska i in., 2018; Leung i in., 2017; Niermann, Wagner, Ziegeldorf i Wulf, 2020). Natomiast do niszowych, rzadko spotykanych w literaturze badań należą te, które weryfikują specyfikę postrzegania przez samo dziecko aktywności fizycznej rodzica i jego innych zachowań zdrowotnych (Niermann i in., 2020).

PROBLEMATYKA BADAŃ WŁASNYCH

Prezentowana rozprawa doktorska i podjęte badania zmierzały w kierunku weryfikacji poziomu rodzicielskiego modelowania biernego (dawanie przykładu swoimi zachowaniami) i aktywnego poprzez działania rodzica wpływające na aktywność fizyczną i inne nawyki prozdrowotne pięcioletnich dzieci.

Tematyka badań dotyczących weryfikacji roli rodzicielskiego modelowania (biernego i czynnego) zachowań zdrowotnych (w szczególności aktywności fizycznej u dzieci w wieku przedszkolnym) stanowi istotną niszę tematyczną w obrębie nauk o kulturze fizycznej. Artykuły wchodzące w skład rozprawy doktorskiej prezentują dwa etapy eksploracji naukowej: w pierwszej kolejności sporządzony został przegląd najnowszej literatury naukowej dotyczącej roli aktywności fizycznej rodziców dla dobrostanu dziecka. Uzyskana wiedza pozwoliła na postawienie empirycznych celów i pytań badawczych.

Systematyczny przegląd literatury zaprezentowany w pierwszej publikacji w cyklu doktorskim (Physical activity and psychophysical well-being of children with disabilities and their families – a systematic review) pozwolił opracować zmienne modelu badawczego wskazujące, jak istotna jest relacja pomiędzy postawą rodzicielską wobec aktywności fizycznej a aktywnością fizyczną dziecka. Relacje między uczestnictwem i umiejętnym dostosowywaniem tejże aktywności do potrzeb psychoruchowych dzieci są ważne zarówno w procesie fizjoterapeutycznym, jak i w profilaktyce zdrowotnej rodzin. Systematyczny przegląd literatury stał się istotny, ponieważ umożliwił ustalenie, w jaki sposób aktywność fizyczna rodziny oddziałuje na jej poziom i dobrostan psychoruchowy dzieci. Podkreśla on, że środowisko rodzinne odgrywa kluczową rolę w umożliwianiu podejmowania się aktywności fizycznej dzieci, a wspierające interwencje rodzinne są kluczowe w zachęcaniu do aktywnego stylu życia.

W przeglądzie przeanalizowano badania opublikowane w latach 2010-2020, skupiające się na dzieciach w wieku 0-19 lat z niepełnosprawnościami ruchowymi, ale bez niepełnosprawności intelektualnych. W badaniach objętych przeglądem systematycznym wykorzystano różne narzędzia badawcze (w tym najczęściej akcelerometr oraz Międzynarodowa Klasyfikacja Funkcjonowania Niepełnosprawności i Zdrowia-ICF), do pomiaru poziomu aktywności fizycznej dzieci i ich rodziców.

Wyniki wykazały, że dzieci z niepełnosprawnościami ruchowymi często uczestniczą mniej w aktywnościach fizycznych w porównaniu do swoich rówieśników bez

niepełnosprawności, a na przeszkodzie stoją takie bariery jak ograniczenia fizyczne, brak dostępu do odpowiednich obiektów oraz niewystarczające wsparcie rodzinne. Kluczowe wnioski sugerują, że strukturalizowane programy i interwencje, zwłaszcza te angażujące członków rodziny, mogą znacząco zwiększyć poziom aktywności fizycznej, a tym samym poprawić ogólny dobrostan dzieci z różnym stopniem niepełnosprawności. Przegląd podkreśla również znaczenie włączenia opiekunów w planowanie i wspieranie aktywności fizycznej, gdyż ich zaangażowanie bezpośrednio wpływa na zaangażowanie i motywację dziecka. Podsumowując, przegląd inspiruje do dalszych badań i interwencji ukierunkowanych na wsparcie rodzin i dzieci, promując holistyczne podejście, które uwzględnia zarówno zdrowie fizyczne, jak i psychospołeczne. Wyniki podkreślają konieczność promowania aktywności fizycznej jako kluczowego elementu zdrowia i dobrostanu dzieci oraz ich rodzin niezależnie od niepełnosprawności.

Publikacja numer 1 stanowiła bazę teoretyczną do podjęcia wyjaśnienia, w jaki sposób postawy rodzicielskie, określenie celu i zaangażowania w aktywność fizyczną oraz zachowania żywieniowe rodziców oddziałują na zachowania zdrowotne (w szczególności aktywność fizyczną) dzieci przedszkolnych (pięcioletnich).

W dalszej eksploracji empirycznej postawiłam dwa zasadnicze pytania:

Pytanie 1: Czy aktywność fizyczna (cel jej podejmowania i zaangażowanie) rodziców i ich postawy rodzicielskie mają znaczenie dla aktywności fizycznej dzieci pięcioletnich?

Pytanie 2: Jaka jest rola zachowań zdrowotnych i wyglądu rodziców (bierne modelowanie) na postrzeganie przez dzieci sylwetek osób dorosłych?

Profilaktyka związana z aktywnością fizyczną jest istotna dla zapobiegania chorobom cywilizacyjnym w dobie siedzącego trybu życia dorosłych, a w szczególności dzieci. Regularne podejmowanie aktywności fizycznej przez dzieci zmniejsza ryzyko rozwoju chorób przewlekłych (w tym otyłości, chorób krążeniowo-oddechowych, zaburzeń koncentracji, nadmiernego pobudzenia psychoruchowego) w dorosłym życiu (Morcel i in., 2022; van Sluijs i in., 2021; Guo i in., 2023; Aragón-Martín i in., 2021).

Aktywność fizyczna w rodzinie jest istotną częścią kształtowania prozdrowotnych zachowań dzieci (w szczególności w wieku przedszkolnym) oraz wspomaga proces zdrowienia i działania fizjoterapeutyczne. Rodzina jest fundamentem i pierwszym środowiskiem zachęcającym do podejmowania aktywności ruchowej. Dopasowana do potrzeb rozwojowych i zdrowotnych aktywność fizyczna dziecka jest jednym z pierwszych elementów jego

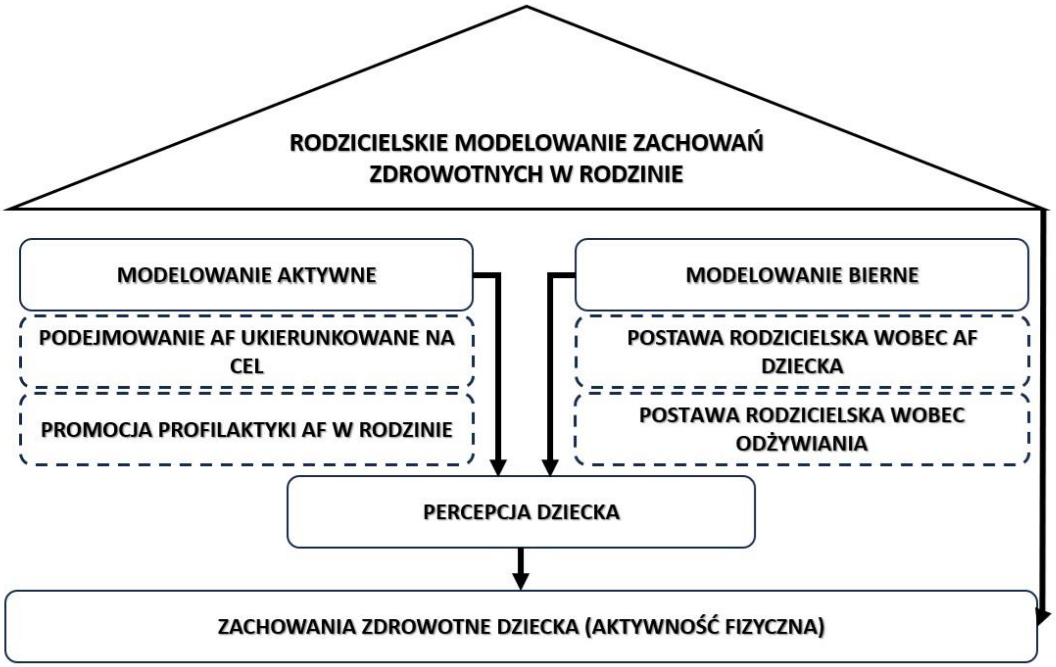
prawidłowego rozwoju psychoruchowego, jak również ważnym elementem wspierającym jego dobrostan w procesie fizjoterapii.

Postawa rodzicielska może oddziaływać na jakość aktywności fizycznej w czasie wolnym od zajęć. Rodzice przez własne zachowania zdrowotne mogą modelować zachowania zaangażowania i poziomu aktywności fizycznej 5-letnich dzieci. Odmienne postawy rodzicielskie będą sprzyjały innym postawom zaangażowania się w aktywność fizyczną i respektowaniu pierwszych samodzielnych wyborów dzieci. Przyjmowana postawa będzie stanowiła pewne kryterium w doborze intensywności i rodzaju aktywności fizycznej. Rodzice preferujący mniej aktywny styl życia mogą nie być wystarczająco zachęcający do podejmowana aktywności fizycznej w rodzinie.

Dzieci od najmłodszych lat obserwują swoich opiekunów, nabywając w ten sposób umiejętności ruchowe i społeczne. Dzieci szczególnie w wieku 5–6 lat podejmują pierwsze samodzielne decyzje dotyczące spożywanych produktów i podejmowanego rodzaju aktywności fizycznej. Obserwacja rodzica przez dziecko jest istotna, ponieważ stanowi fundament pierwszych zachowań zdrowotnych dziecka, w szczególności związanych z aktywnością fizyczną. Wiek średniego dzieciństwa jest również okresem, w którym dziecko zaczyna określać/nazywać swoje ciało i komentować ciało innych osób (dorosłych i dzieci). Zaczyna obserwować je w aspekcie jego kształtu, wielkości i masy ciała.

Rysunek 1

Model badawczy: modelowanie zachowań zdrowotnych w rodzinie



Osoby badane

W artykule 2 przedstawiono badanie przekrojowe, gdzie grupę badaną stanowiło N = 680 rodzin z pięcioletnimi dziećmi (330 dziewcząt i 350 chłopców; M = 5,70; SD = 0,32). W celu kontroli czynników rodzinnych i statusu społeczno-ekonomicznego (SES) zebrano takie zmienne jak: wiek rodziców (M_M = 34,00; SD_M = 5,24; M_O = 37,00; SD_O = 6,00), miejsce zamieszkania dziecka respondentów (24% mieszkało na wsi, 14% w małych miastach, 26% w miastach, 34% w dużych miastach) oraz liczbę dzieci w rodzinie (21% nie miało rodzeństwa). Początkowa liczba uczestników badania wynosiła 806 rodzin z dziećmi.

Wyeliminowano kwestionariusze niekompletne (n = 60) oraz tam, gdzie badanie wykonał tylko jeden z opiekunów (n = 40). Z badania zrezygnowało na samym początku n = 26. Łączna liczba odrzuconych respondentów n = 126.

W artykule 3 przedstawiono badanie przekrojowe, gdzie łącznie w badaniu wzięło udział N = 416 rodzin z pięcioletnimi dziećmi (190 dziewczynek i 226 chłopców; M = 5,70; SD = 0,32). Tylko triady matka–ojciec–dziecko zostały zaproszone do zbadania związku między biernym modelowaniem zachowań zdrowotnych rodziców, a ich postrzeganiem przez ich dzieci.

Aby kontrolować czynniki rodzinne i status społeczno-ekonomiczny (SES), zebrano kilka zmiennych: wiek rodziców (M_M = 34,00; SD_M = 5,24; M_O = 37,00; SD_O = 6,00), obszar zamieszkania respondentów (26,50% mieszkało na wsi, 9,75% w małych miastach, 23,25% w średnich miastach, 40,50% w dużych miastach) oraz liczba dzieci w rodzinie (21% to tylko jedynacy).

Badania wskazane w publikacjach 2 i 3 we wskazanej rozprawie doktorskiej były częścią większego projektu badawczego sfinansowanego przez narodowe Centrum Nauki (NCN) o numerze grantu: 2015/17/B/HS6/04144 (kierownik grantu: prof. Małgorzata Lipowska, główny wykonawca: prof. Mariusz Lipowski).

Narzędzia badawcze

Skala Postaw Rodzicielskich (Plopa, 2008)

Skala zawiera 50 stwierdzeń diagnostycznych pogrupowanych w pięć wymiarów odpowiadających pięciu różnym postawom rodzicielskim: akceptacja–odrzucenie, autonomia, nadopiekuńczość, roszczenie, niekonsekwencja. Wymiar akceptacja–odrzucenie opisuje

poziom akceptacji rodzicielskiej dziecka, gdzie niskie wyniki wskazują na postawy zdystansowane, niewrażliwe i odrzucające (psychologicznie i fizycznie) wobec dziecka, a wysokie na akceptację, wsparcie i wrażliwość rodziców postawy.

Wymiar autonomia mierzy poziom szacunku rodziców dla potrzeb dziecka i umiejętności dostosowania zachowań rodzicielskich do potrzeb rozwojowych dziecka (im wyższy wynik, tym wyższa akceptacja autonomii dziecka).

Wymiar nadopiekuńczość mierzy skłonność do postrzegania własnego dziecka jako bezbronnego, bezradnego i zależnego. Im wyższy wynik w tym wymiarze, tym większe nasilenie postawy nieufnej i nadmiernej troski o przyszłość dziecka.

Wymiar roszczenie koncentruje się na oczekiwaniach rodziców wobec dziecka. Wysokie wyniki w tym wymiarze wiążą się z bardziej sztywnymi i krytycznymi postawami wobec dziecka oraz cenieniem u dziecka zachowań uległych.

Wymiar niekonsekwencji mierzy skłonność rodziców do niespójnych reakcji zależnych od ich nastroju i sytuacji życiowej oraz ogólną stabilność emocjonalną rodziców (Plopa, 2008).

Respondentów poproszono o ocenę na pięciostopniowej skali, jak bardzo zgadzają się lub nie zgadzają ze stwierdzeniami odpowiadającymi tym pięciu wymiarom postaw rodzicielskich. Kwestionariusz jest dostępny w dwóch wersjach do badania postaw matczynych i ojcowskich. Każdą z postaw możemy określać stopniem nasilenia zachowań: wysoki – niski. Spośród wszystkich wymienionych postaw rodzicielskich możemy określić, że dwie pierwsze z nich są określane jako pozytywne, a trzy kolejne jako negatywne, niepożądane. Postawa rodzicielska (ojca albo matki) może mieć odmienne znaczenie na rozwój córki lub syna.

Kwestionariusz Celów Aktywności Fizycznej (Lipowski i Zaleski, 2015)

Narzędzie służy do badania motywacyjnej funkcji celu aktywności fizycznej. W *KCAF* znajdują się pytania dające możliwość kontrolowania zmiennych, takich jak różnorodność formy, objętości i częstotliwości aktywności fizycznej oraz zmiennych socjogeograficznych. Podczas przeprowadzania wywiadu osoba badana odpowiada na pytania dotyczące uczestnictwa przez niego w sporcie zarówno obecnie, jak i w przeszłości. Dodatkowo jej zadaniem jest ocena stosunku do biernego zaangażowania w aktywność ruchową.

Kwestionariusz KCAF w badaniu własnym pozwolił na zebranie szczegółowych informacji z wywiadu dotyczących historii sportowej rodziców i ich obecnego zaangażowania w różne formy aktywności fizycznej. Informacje zawarte w kwestionariuszu pozwoliły ustalić, czy rodzic był aktywny fizycznie obecnie oraz w przeszłości. Ważną częścią kwestionariusza jest analiza liczby godzin miesięcznie poświęcanych na określone rodzaje aktywności fizycznej

(np. siłownia, pływanie, bieganie, sporty zespołowe, sztuki walki); dodatkowo respondenci wskazywali, czy podejmują te czynności regularnie, czy sporadycznie.

Kwestionariusz pozwala również na analizę motywacji podejmowanego celu aktywności fizycznej. Po analizie wartości kwestionariusza wyróżnia się ITEM w kontekście teorii motywacyjnej funkcji celu. Wyodrębnione zostały następujące podskalne: wartość motywacyjna (siła, z jaką cele wpływają na podejmowanie przez jednostkę działania), organizacja czasu (poziom skoncentrowania na planowaniu, organizowaniu i podporządkowaniu czasu dla aktywności fizycznej), wytrwałość w działaniu (skuteczność i trwałość działania oraz radzenie sobie z przeciwnościami), konflikt motywacyjny (poziom sprzeczności: cele aktywności fizycznej *vs.* inne cele). Wskaźnik α Cronbacha = 0,78 (Lipowski i Zaleski, 2015).

Inwentarz Zachowań Zdrowotnych (Juczyński, 2001)

Kwestionariusz jest wykorzystywany do badania zarówno osób zdrowych, jak i chorych. Służy do oceny zaangażowania w praktyki prozdrowotne dorosłego człowieka. Inwentarz Zachowań Zdrowotnych (IZZ) składa się z 24 stwierdzeń, które opisują różne typy zachowań prozdrowotnych. Wyróżniamy poszczególne obszary, takie jak: Prawidłowe Nawyki Żywieniowe, Zachowania Profilaktyczne, Praktyki Zdrowotne i Pozytywne Postawy Psychologiczne.

Respondenci w trakcie badania deklarują, jak często angażują się w różne działania, stosując 5-punktową skalę (od 1 do 5, gdzie: 1 oznacza prawie nigdy, 2 – rzadko, 3 – od czasu do czasu, 4 – często, 5 – prawie zawsze). Zgodność wewnętrzna IZZ ustalona na podstawie α Cronbacha i wynosi 0,85 dla całego Inwentarza, natomiast dla jego czterech podskal mieści się w granicach od 0,60 do 0,65.

Wyniki są skategoryzowane w czterech skalach mierzących poszczególne aspekty zachowań zdrowotnych: Pozytywne Nastawienia Psychiczne (PNP), Zachowania Profilaktyczne (ZP), Prawidłowe Nawyki Żywieniowe (PNŻ) oraz Praktyki Zdrowotne (PZ). W procedurze badawczej skupiono się na analizie danych podskali „Prawidłowe Nawyki Żywieniowe" matki i ojca wobec postrzegania sylwetki dorosłego ciała przez pięcioletnie dzieci.

Ankieta do oceny aktywności fizycznej dzieci

Wykorzystana ankieta została opracowana przez zaślepionych recenzentów dla bieżącego projektu. W trakcie przeprowadzanej ankiety rodzice odpowiadali na pytania, wskazując, ile godzin tygodniowo dziecko poświęca na aktywność fizyczną rekreacyjną, kategoryzując ją następująco: zabawę na świeżym powietrzu, zorganizowane zajęcia sportowe, spacery z rodzicami, jazdę na rowerze, zabawę na placach zabaw.

Dodatkowo ankieta zawierała informacje dotyczące ilości posiadanego w domu sprzętu sportowego, jednakże nie było to zmienną bezpośrednio analizowaną. Zmienne, które zaprezentowano w badaniu, to liczba godzin spędzanych na dodatkowych zajęciach mających charakter ruchowy, w które dzieci się angażują poza placówką oświatową (poza szkołą/przedszkolem) z rodzicami oraz bez nich. Rodziców poproszono o określenie, ile godzin tygodniowo dziecko poświęca na zajęcia ruchowe dodatkowe oraz ile czasu spędza z rodziną na aktywności fizycznej.

Aby zobiektywizować ocenę rodziców aktywności fizycznej swoich dzieci, użyto skali Likerta. Rodzic oceniał aktywność fizyczną, stosując 5-stopniową skalę od 1 (moje dziecko ma bardzo niską sprawność fizyczną) do 5 (moje dziecko ma bardzo wysoką sprawność fizyczną).

Skala Piękno i Zdrowie (Lipowska i Lipowski, 2018)

Procedura badania w skali Piękno i Zdrowie (PiZ) polega na dopasowaniu przez dzieci cech związanych z zachowaniami prozdrowotnymi lub antyzdrowotnymi oraz statusem społecznym do sylwetek kobiet i mężczyzn o wyraźnie odmiennej masie ciała.

Skala *PiZ* Jest przeznaczony do badania dzieci w wieku 5–9 lat i pozwala określić, w jaki sposób dzieci przypisują sukces społeczny i zachowania związane ze zdrowiem kobietom i mężczyznom o różnych kształtach ciała. Skala PiZ składa się z 18 pytań. Niektóre z nich są poparte ilustracjami przedstawiającymi różne zdrowe zachowania. Dziecko jest proszone o dopasowanie każdej aktywności do jednego z trzech obrazków przedstawiających osoby dorosłe o różnych kształtach ciała (szczupłe, w normowadze i otyłe).

Badanie obejmuje pytania dotyczące funkcjonowania społecznego osób o różnych typach ciała. Kwestionariusz został przygotowany w dwóch wariantach, dla dziewcząt i chłopców, odnosząc się odpowiednio do kobiet i mężczyzn. Możemy podzielić Skala Piękno i Zdrowie na dwie podskale, takie jak Skala Piękna i Skala Zdrowia. Analizowano jedynie kwestie związane z praktykami zdrowotnymi ze skali zdrowotnej. Pytania dotyczące skali

zdrowia znajdują się na początku formularza do badania i odnoszą się do rodzajów aktywności bądź jej braku w trakcie czasu wolnego.

Ocena składu ciała

Do oceny składu ciała wykorzystano analizator składu ciała Tanita (*Segmental Body Composition Monitor* – Tanita BC-601). Narzędzie to wykonuje pomiar procentowy tkanki tłuszczowej, tkanki tłuszczowej trzewnej, masy mięśniowej oraz ilości wody w organizmie.

Za pomocą wskazanych parametrów oraz dodatkowych informacji dotyczących masy i wysokości ciała narzędzie badawcze ocenia stosunek procentowy wskaźników wskazując, czy dorosły lub dziecko jest zagrożone otyłością, nadwagą bądź też niedowagą. Narzędzie badawcze zostało wykorzystane do analizy komponentów składu ciała dorosłych i ich dzieci.

Do analizy danych wykorzystano takie parametry jak: procentowe otłuszczenie ciała rodziców i dzieci, wartość masy i wysokości ciała dziecka i rodzica.

Procedura badawcza została przeprowadzana w placówkach oświatowych na terenie województwa pomorskiego.

GŁÓWNE WYNIKI BADAŃ, DYSKUSJA

Główne wyniki badań

Główne wyniki rozprawy doktorskiej wskazują, że ważniejszym elementem oddziaływującym na aktywność fizyczną dziecka pięcioletniego w czasie wolnym jest cel podejmowanej aktywności fizycznej dorosłego (matki/ojca) i to on istotnie korelował z podejmowaniem ruchu przez dzieci pięcioletnie. U ojców dzieci tylko cztery postawy miały znaczenie na podejmowane cele aktywności fizycznej: akceptacja–odrzucenie, niekonsekwencja, autonomia i nadmierna opiekuńczość. Z celami matek skorelowana była większa liczba postaw: akceptacja–odrzucenie, autonomia, niekonsekwencja, nadmierne wymagania i nadmiernie opiekuńcze. Podobnie akceptacja–odrzucenie, autonomia i nadmiernie opiekuńcze postawy matek i ojców skorelowane były z celami aktywności fizycznej, ale nie były bezpośrednio z nią powiązane w czasie wolnym ich dzieci. Postawa rodzicielska nie oddziaływała bezpośrednio na aktywność fizyczną dzieci pięcioletnich. Dodatkowo zaobserwowano, że liczba godzin spędzanych miesięcznie przez matkę lub ojca na aktywność fizyczną nie miała statystycznie istotnego znaczenia dla spędzanie czasu wolnego dziecka z aktywnością fizyczną.

Kolejnym z istotnych wyników jest relacja pomiędzy biernym rodzicielskim modelowaniem a postrzeganiem przez dziecko pięcioletnie sylwetki dorosłego człowieka (kobiety/mężczyzny). Ciekawym wynikiem okazała się relacja między zachowaniami żywieniowymi rodziców (matki i ojca) a percepcją wyglądu sylwetki dorosłego człowieka (kobiety i mężczyzny) przez dzieci pięcioletnie obojga płci. W odniesieniu do chłopców wskazano dwie istotne zależności, im wyższy poziom prawidłowych nawyków żywieniowych ojca, tym częściej synowie przypisywali szczupłej kobiecej sylwetce zaangażowanie w praktyki prozdrowotne. Z kolei druga zależność wskazywała, że im wyższy poziom prawidłowych nawyków żywieniowych matki, tym rzadziej synowie kojarzyli zaangażowanie kobiet w praktyki prozdrowotne z otyłą sylwetką kobiecą. W grupie dziewcząt stwierdzono tylko jedną istotną zależność i dotyczyła ona oceny sylwetki męskiej. Im zdrowiej odżywiały się matki, tym częściej ich córki łączyły zachowania prozdrowotne z prawidłową sylwetką męską. Intensywność aktywności fizycznej rodziców ani ich obiektywne i obserwowalne parametry wyglądu (procent tkanki tłuszczowej) nie odgrywały istotnej roli w poznawczym przypisywaniu kształtu ciała do zaangażowania w praktyki zdrowotne. Zatem rola płci dzieci w percepcji dorosłej sylwetki kobiet i mężczyzn przez dzieci okazała się istotna.

Wśród pięcioletnich dziewczynek zdrowe śniadanie kojarzyło się najczęściej z szczupłą sylwetką, rzadziej z sylwetką w normowadze kobiet. Chłopcy nieznacznie częściej wskazywali szczupłą sylwetkę w aspekcie spożywanego zdrowego śniadania u kobiet. Natomiast w odniesieniu do mężczyzn dzieci pięcioletnie nie kojarzą zdrowego śniadania z typowym posiłkiem dla mężczyzn.

Zupełną odwrotność dostrzeżono przy spożywaniu niezdrowego śniadania (typu fast food). Śniadania typu fast food były powiązane z otyłością u kobiet, ale nie u mężczyzn.

Dzieci pięcioletnie często komentowały sylwetkę kobiet „jedzą w ten sposób, więc są grube", a u mężczyzn: „jest szczupły, takie jedzenie mu nie zaszkodzi". Płeć dzieci okazała się istotna w relacji postrzegania sylwetek dorosłych kobiet i mężczyzn w aspekcie ich sposobu odżywiania.

Natomiast bierne modelowanie rodzicielskie wobec swoich pięcioletnich dzieci w aspekcie aktywności fizycznej nie było wystarczające, by oddziaływało na postrzeganie sylwetki ciała dorosłego człowieka (kobiety/mężczyzny) przez ich dzieci. W modelowaniu rodzicielskim aktywności fizycznej dziecka ważniejsze okazuje się aktywne modelowanie rodzicielskie.

Aktywna komponenta rodzicielskiego modelowania jest niezbędnym predyktorem w relacji z aktywnością fizyczną dzieci w wieku przedszkolnym. Równie ważna jest promocja profilaktyki i tym samym uczenie opiekunów (rodziców), w jaki sposób mogą angażować swoje dzieci w aktywność fizyczną. Uważne planowanie ruchu w rodzinie i odpowiednie zaangażowanie oraz postawa wspomagają wzrost poziomu różnorodnej aktywności fizycznej w czasie wolnym od zajęć.

Wsparcie rodziców jest istotnym elementem wspomagającym podejmowanie wyborów dziecięcych wobec zaangażowania się w aktywność fizyczną przez dzieci (Garriguet i in., 2017). Zdrowy obraz własnego ciała, który uzyskamy dzięki modelowaniu rodzica, będzie korelował z naszym obrazem ciała w dorosłym życiu i będzie zapobiegał nieprawidłowym i skrajnym zachowaniom wobec aktywności fizycznej. Badania potwierdzają wpływ rodziców na aktywność fizyczną ich dzieci (Khambalia i in., 2012; Kriemler i in., 2011; Santos i in., 2023).

Opiekunowie nieprezentujący korzystnych dla zdrowia zachowań zdrowotnych (w szczególności korzystnych zachowań ruchowych) będą przekazywali nieprawidłowe wzorce zachowań swoim dzieciom w okresie średniego dzieciństwa.

Bierne rodzicielskie modelowanie okazuje się bardziej istotne dla percypowania sylwetki dorosłego człowieka (kobiety/mężczyzny) przez dzieci pięcioletnie w obszarze zachowań

żywieniowych rodziców (matki/ojca) niż aktywności fizycznej całej rodziny. Sposób odżywiania się rodziny jest niezwykle ważny, jednakże klasyfikowany jest w normach kulturowych, wynikających często z pochodzenia populacji i jej przekonań związanych z tym, co powinno się jeść w rodzinie (Dorrance Hall i in., 2021). Można wnioskować, że jakość spożywanych posiłków jest bardziej zauważalna przez dzieci w ich czasie wolnym niż to, w jaką aktywność angażuje się rodzic w czasie wolnym. Obserwacja aktywności fizycznej wydaje się więc niewystarczająca, by zaszło bierne modelowanie rodzicielskie tejże aktywności wobec ich dzieci.

Gualdi-Russo i inni wskazali, że obraz ciała w literaturze jest uznawany za ważną zmienną korelującą z aktywnością fizyczną i zachowaniami ruchowymi dzieci i dorosłych (Gualdi-Russo i in., 2022).

Dzieci w okresie średniego dzieciństwa uczą się klasyfikować, oceniać oraz określać obraz ciała drugiego człowieka, a ich podstawą staje się obserwacja opiekunów. Jednakże w prezentowanym projekcie badawczym wykazano, że ocena obrazu ciała przez małe dzieci nie była wystarczająca w aspekcie modelowania rodzicielskiego aktywności ruchowej dzieci. Kształtowanie się zachowań związanych z aktywnością fizyczną w aspekcie obrazu ciała, postaw rodzicielskich, celów podejmowania ruchu następuje już w najmłodszych latach życia dzieci. Wtedy mamy największy wpływ na ich przyszłe nawyki prozdrowotne.

Jednakże, by zaistniało efektywne modelowanie zachowań zdrowotnych, w szczególności o charakterze prozdrowotnym w rodzinie, rodzic musi przejawiać zachowania aktywne (definiowane jako świadome działanie i tym samym czynne uczestnictwo wraz z dzieckiem w ruchu i celowane zaangażowanie w aktywność) wobec swoich dzieci oraz przejawiać biernie aspekty modelowania (definiowane jako obserwowanie przez dziecko sposobu funkcjonowania rodzica w swoim codziennym życiu, przy czym rodzic nie ma celowości tej intencji działania) w szczególności w obszarze aktywności fizycznej oraz sposobu odżywiania się w rodzinie. Obydwie komponenty są niezwykle istotne dla modelowania zachowań zdrowotnych w rodzinie i będą skutkowały lepszą jakością planowania działań profilaktycznych i promujących na rzecz aktywności fizycznej w rodzinie, w szczególności w ich czasie wolnym od zajęć edukacyjnych i pracowniczych.

W prezentowanej rozprawie doktorskiej uwidoczniono, że efektywne rodzicielskie modelowanie zachowań dziecka pięcioletniego musi zawierać komponentę zarówno aktywną, jak i bierną. Jedynie bierna komponenta (obserwacja rodzica przez dziecko oraz działanie rodzica bez wyraźnej komponenty zaangażowania się w aktywność fizyczną wobec modelowania zachowań zdrowotnych dzieci w szczególności dotyczących aktywności

ruchowej) nie jest wystarczająca. Komponenta aktywnego działania w modelowaniu rodzicielskich zachowań zdrowotnych wobec dzieci ma korzystniejsze znaczenie na podejmowaną przez nie na aktywność fizyczną.

Dzieci w okresie średniego dzieciństwa podejmują pierwsze samodzielne wybory dotyczące ich własnych zachowań zdrowotnych (prozdrowotnych i antyzdrowotnych). Dlatego też ten wiek jest niezwykle istotny i krytyczny w rozwoju psychoruchowym dziecka. W tym okresie dzieci uczą się klasyfikować, oceniać oraz określać obraz ciała drugiego człowieka, a podstawą tych procesów staje się obserwacja opiekunów.

Ważne jest, by rodziców edukowano i tym samym nauczano planowania zdrowych wyborów wobec własnych zachowań zdrowotnych (żywieniowych i ruchowych).

Obydwie komponenty są niezwykle istotne dla modelowania zachowań zdrowotnych w rodzinie. Będą skutkowały lepszym planowaniem i promowaniem aktywności fizycznej w systemie rodziny.

PODSUMOWANIE, OGRANICZENIA I PERSPEKTYWY DALSZYCH BADAŃ

Definiując pojęcia zdrowia jako „stanu dobrego samopoczucia fizycznego, psychicznego i społecznego, a nie tylko braku choroby lub niepełnosprawności" możemy odnieść się do rodzicielskiego modelowania zachowań zdrowotnych dzieci małych (przedszkolnych), gdyż właśnie zachowanie dobrostanu rodzica będzie wpływało na kształtowanie dobrostanu dziecka. WHO (2020) podkreśla, że jednym z ważniejszych elementów zadbania o ten dobrostan jest podejmowanie regularnej aktywności fizycznej w rodzinie. Najbliższe środowisko dzieci przedszkolnych – rodzina – stanowi pierwszy fundament kształtowania zachowań zdrowotnych, w szczególności aktywności fizycznej.

Wiek przedszkolny wiąże się z pierwszymi samodzielnymi decyzjami związanymi z zachowaniami prozdrowotnymi i jest to czas, kiedy dziecko zaczyna dostrzegać i w pewien sposób definiować własne ciało, a przede wszystkim definiować/oceniać ciało dorosłego (Lipowska i Jankowska, 2006). Profilaktyka związana z aktywnością fizyczną jest istotna dla zapobiegania chorobom cywilizacyjnym w dobie siedzącego trybu życia dorosłych i dzieci. Aktywność fizyczna podejmowana przez dzieci zmniejsza ryzyko rozwoju chorób przewlekłych (w tym otyłości, chorób krążeniowo-oddechowych, zaburzeń koncentracji, nadmiernego pobudzenia psychoruchowego) w dorosłym życiu.

Rodzicielskie modelowanie zachowań wobec dziecka musi więc zawierać komponentę aktywnego działania (zaangażowania się w aktywność fizyczną wraz z dzieckiem) oraz biernej postawy, jaką prezentuje rodzic (nie ma czynnego zaangażowania i intencji w swoje zachowania zdrowotne). Dziecko percypuje obraz swojego opiekuna (ojca/matki), kształtując własne poczucie, jak powinno wyglądać zdrowe ciało i korzystne zachowania zdrowotne. Bierne uczestnictwo w aktywności nie jest tak korzystne dla poprawy jego poziomu, jak połączenie tych dwóch aspektów biernego i czynnego. Otrzymane wyniki uwidoczniły również trend, że chude ciało jest równe zdrowemu ciału. W dobie rozwoju cyfryzacji i coraz większego niedoboru aktywności fizycznej powinniśmy wdrażać programy profilaktyczne kształtujące poprawny obraz ciała dorosłego i dziecka za pomocą modelowania rodzicielskiego w dwóch wcześniej opisywanych komponentach (aktywnej i biernej).

Ograniczenia i utrudnienia wskazanych badań

W badaniu tym nie stosowano randomizacji ani zaślepienia grupy badanej, wynikało to z braku grupy kontrolnej. Brak badania podłużnego miał także związek z celowym doborem

grupy wiekowej dzieci. Badania podłużne wymagają, aby uczestnicy byli wystarczająco zmotywowani do ukończenia procedury badania. Przekrojowy charakter przedstawionego projektu badawczego był związany z przetestowaniem dużej grupy rodzin z ich pięcioletnimi dziećmi i uzyskania jak najdokładniejszych wyników podlegających analizie statystycznej.

Kolejnym ograniczeniem we wskazanej procedurze badawczej jest wykorzystanie nie tylko standaryzowanych kwestionariuszy i skal, lecz także subiektywnej oceny rodziców na temat aktywności fizycznej ich pięcioletnich dzieci. W celu zwiększenia obiektywizacji odczuć rodziców odnośnie do oceny aktywności fizycznej ich dzieci zastosowano 5-punktową skalę. Jednakże niemożliwe jest zupełne wyeliminowane subiektywnej oceny rodzica, gdyż jest to związane z jego emocjonalnym stosunkiem do własnego dziecka.

Przyszłe kierunki badań

Badania dotyczące aktywności fizycznej w rodzinie są niezwykle istotne, ponieważ to członkowie najbliższej rodziny wskazują nam pierwsze fundamenty zachowań zdrowotnych (prozdrowotnych /antyzdrowotnych) w życiu dzieci.

W przyszłości edukacja i promowanie mogą realnie zmniejszyć niekorzystne zachowania zdrowotne (antyzdrowotne) prowadzące do chorób cywilizacyjnych społeczeństwa. Warto rozszerzyć procedurę o charakter badania podłużnego w celu zbadania różnic związanych z wiekiem dziecka i różnicami w postrzeganiu aktywności fizycznej dzieci starszych przez ich rodziców. W przyszłości można kontynuować prezentowaną tematykę badań, prowadząc obserwację rodzin w aspekcie międzykulturowym.

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STRESZCZENIE

Wskazana praca badawcza przedstawia relacje między rodzicielskim modelowaniem zachowań zdrowotnych (prozdrowotnych i antyzdrowotnych) w szczególności aktywności fizycznej wobec dzieci w okresie średniego dzieciństwa (dzieci pięcioletnie).

Analizom poddano znaczenie postaw i zachowań rodzicielskich dla aktywności fizycznej dzieci oraz ich percepcję ciała i zdrowia. Badanie podkreśla znaczenie aktywnego i biernego modelowania przez rodziców w kształtowaniu prozdrowotnych zachowań dzieci.

Interesujące mnie cele badawcze to:

- Eksploracja związku między rodzicielskim modelowaniem a aktywnością fizyczną dzieci pięcioletnich,
- Analiza znaczenia postaw rodzicielskich na wybory zdrowotne dzieci pięcioletnie,
- Analiza sposobu postrzegania ciała dorosłego człowieka przez dzieci pięcioletnie w aspekcie zachowań zdrowotnych rodziców.

Metodyka prezentowanego badania przekrojowego obejmuje kilka kluczowych etapów, które składają się na kompleksowe podejście do analizy znaczenia rodzicielskiego modelowania na aktywność fizyczną i zachowania prozdrowotne dzieci pięcioletnich. Podkreśla ona wielowymiarowe podejście do badania złożonych zjawisk psychologicznych i behawioralnych w rodzinie. Pozwala na uzyskanie głębokiego zrozumienia oddziałowywania rodzicielskiego modelowania na rozwój prozdrowotnych postaw i zachowań u dzieci, uwzględniając zarówno perspektywę rodziców, jak i ich dzieci.

Pierwszym etapem rozważań prezentowanej rozprawy doktorskiej było przeprowadzenie szczegółowego przeglądu literatury, mającego na celu zidentyfikowanie istotnych publikacji i badań dotyczących tematu modelowania rodzicielskiego i jego znaczenia na aktywność fizyczną w aspekcie zdrowia oraz procesu wsparcia rozwoju dzieci z niepełnosprawnością ruchową. Następnie po przeprowadzonej analizie literatury postanowiłam wykonać badanie przekrojowe na zdrowej populacji rodzin z ich pięcioletnimi dziećmi.

Przeprowadzono procedurę badawczą u N = 806 rodzin wraz z pięcioletnimi dziećmi. Ostateczna liczba badanych stanowiła n = 680 rodzin z pięcioletnimi dziećmi (330 dziewcząt i 350 chłopców; M = 5,70, SD = 0,32). Tylko triady matka-ojciec-dziecko zostały zaproszone do zbadania analizy relacji rodzicielskiego modelowania (postawy rodzicielskiej, określenia celu i zaangażowania w aktywność fizyczną rodzica) i jego znaczenia na aktywność fizyczną dzieci w czasie wolnym od zajęć w placówkach edukacyjnych.

Wykorzystano następujące narzędzia badawcze jak Skalę Postaw Rodzicielskich wg Plopy, Kwestionariusz Celów Aktywności Fizycznej, Ankietę oceny aktywności fizycznej dzieci pięcioletnich przez rodziców oraz ocenę składu ciała mierzoną aparaturą TANITA.

Kolejny etap badania skupił się na analizie percepcji sylwetki dorosłego człowieka przez pięcioletnie dziecko w aspekcie modelowania rodzicielskiego zachowań zdrowotnych rodzica wobec swojego dziecka.

Zakwalifikowano N = 416 rodzin z pięcioletnimi dziećmi (190 dziewczynek i 226 chłopców; M = 5,70; SD = 0,32). Tylko triady matka-ojciec-dziecko zostały zaproszone do zbadania związku między biernym modelowaniem zachowań zdrowotnych rodziców, a ich postrzeganiem przez ich pięcioletnie dzieci.

W drugim badaniu przekrojowym wykorzystano narzędzia badawcze takie jak Kwestionariusz Celów Aktywności Fizycznej, Inwentarz Zachowań Żywieniowych, Skalę Piękno i Zdrowie, Analiza składu ciała (procentowa wartość tkanki tłuszczowej).

Wyniki wskazują, że modelowanie rodzicielskie ma znaczący wartość na aktywność fizyczną i zachowania zdrowotne dzieci, a percepcja ciała jest powiązana z rodzicielskimi zachowaniami zdrowotnymi. Modelowanie rodzicielskie możemy postrzegać w dwóch aspektach, jako aktywne (świadome zaangażowanie w działania na rzecz modelowania zachowań zdrowotnych np. określenie celu i zaangażowania w aktywność fizyczną oraz realne uczestnictwo w ruchu z dzieckiem) i bierne (rozumiane jako nieświadome działanie przejawiane w postawie rodzicielskiej, zachowaniach żywieniowych, nie mające bezpośrednio komponenty zaangażowania rodzica w daną czynność oraz rozumiane jako obserwacja rodzica przez dziecko - jego zachowań wobec aktywności fizycznej).

Dla modelowania zachowań zdrowotnych w zakresie aktywności fizycznej dzieci pięcioletnich potrzebna jest komponenta aktywna i bierna. Szczególnie należy podkreślać istotność komponenty aktywnej wobec modelowania uczestnictwa dziecka w aktywność ruchową w systemie rodziny. Komponenta biernego modelowanie rodzicielskie posiada większe znaczenie dla relacji między zachowaniami żywieniowych rodzica a postrzeganiem ciała sylwetki dorosłego człowieka przez dziecko pięcioletnie.

Edukacja rodziców w zakresie promowania prozdrowotnych zachowań okazuje się kluczowa dla rozwoju prozdrowotnych zachowań dzieci pięcioletnich. Wnioskując należy podkreślić potrzebę zintegrowanych działań edukacyjnych i korzystnego modelowania rodzicielskiego zawierającego obydwie komponenty by mogło korzystnie ono wpłynąć na aktywność fizyczną w rodzinie.

Zrównoważone modelowanie zachowań zdrowotnych rodziców prowadzi do wsparcia zbilansowanego rozwoju psychoruchowego dzieci i oddziałowuje na aspekt profilaktyki zaangażowania się w aktywności fizyczną rodziców z dziećmi. Dodatkowo modelowanie aktywności fizycznej przez rodzica jest istotnym elementem wspomagania procesu rehabilitacyjnego dzieci z niepełnosprawnością ruchową.

SUMMARY

The above-mentioned research work presents the relationship between parental modeling of health behaviors (pro-health and anti-health), in particular physical activity towards offspring in middle childhood (5-year-old children).

The impact of parental attitudes and behaviors on children's physical activity and their perception of their body and health was analyzed. The study highlights the importance of active and passive modeling by parents in shaping children's healthy behaviors.

The research goals that interest me are:

• Exploration of the relationship between parental modeling and physical activity of 5-year-old children,

• Analysis of the impact of parental attitudes on the health choices of 5-year-old children,

• Analysis of the way 5-year-old children perceive the adult body

in the aspect of parents' health behaviors.

The methodology of the presented cross-sectional study includes several key stages that constitute a comprehensive approach to analyzing the impact of parental modeling on the physical activity and health-promoting behaviors of 5-year-old children. It emphasizes a multidimensional approach to the study of complex psychological and behavioral phenomena in the family. It allows you to gain a deep understanding of the impact of parental modeling on the development of healthy attitudes and behaviors in children, considering both the perspective of parents and their children.

The first stage of the considerations of this doctoral dissertation was to conduct a detailed literature review aimed at identifying relevant publications and research on the topic of parental modeling and its impact on physical activity in the aspect of health and the process of supporting the development of children with physical disabilities. Then, after analyzing the literature, I decided to conduct a cross-sectional study on a healthy population of families with their 5-year-old children.

The research procedure was carried out on $N = 806$ families with 5-year-old children. The final number of respondents was n = 680 families with 5-year-old children (330 girls and 350 boys; $M = 5.70$, $SD = 0.32$). Only mother-father-child triads were invited to study the analysis of the relationship between parental modeling (parental attitude, goal setting and parental involvement in physical activity) and its impact on children's physical activity during free time in educational institutions.

The following research tools were used: the Physical Activity Goals Questionnaire, the Parental Attitudes Scale according to Plopa, the Survey on the level of physical activity in 5-year-old children and body composition parameters measured with the TANITA apparatus.

The next stage of the study focused on the analysis of the perception of an adult's figure by a 5-year-old child in the aspect of parental modeling of health behaviors of the parent towards his or her offspring. $N = 416$ families with 5-year-old children were enrolled (190 girls and 226 boys; $M = 5.70$, $SD = 0.32$). Only mother-father-child triads were invited to examine the relationship between parents' passive modeling of health behaviors and their perception of them by their 5-year-old children.

The second cross-sectional study used research tools such as the Physical Activity Goals Questionnaire, Eating Behavior Inventory, Beauty and Health Scale, and body composition analysis (percentage of body fat).

The results indicate that parental modeling has a significant impact on children's physical activity and health behaviors, and body perception is associated with parental health behaviors. Parental modeling can be perceived in two aspects, as active (conscious involvement in activities aimed at modeling health behaviors, e.g., defining the goal and involvement in physical activity and real participation in physical activity with the child) and passive (understood as unconscious action manifested in the parental attitude, behaviors nutritional, not having a direct component of parental involvement).

For modeling health behaviors of 5-year-olds children in the field of physical activity need an active and passive component. The importance of the active component in modeling the child's participation in physical activity in the family system should be particularly emphasized.

The passive component of parental modeling is more important for the relationship between the parent's eating behavior and the perception of the adult body by a 5-year-old child.

Parental education in promoting healthy behaviors turns out to be crucial for the development of healthy behaviors in 5-year-old children. When concluding, the need for integrated educational activities should be emphasized and favorable parental modeling containing both components so that it could have a positive impact on physical activity in the family.

Balanced modeling of parents' health behaviors leads to support for balanced psychomotor development of children and influences the preventive aspect of engaging in physical activity between parents and children. Additionally, modeling physical activity by

parents is an important element of supporting the rehabilitation process of children with physical disabilities.

SZKOŁA DOKTORSKA

OŚWIADCZENIE WSPÓŁAUTORÓW PUBLIKACJI

Kamionka, A., & Lipowski, M. (2021). Physical activity and psychophysical well-being of children with disabilities and their families – a systematic review. *Acta Kinesiologica, 15*(1), 105-119. https://doi.org/10.51371/issn.1840-2976.2021.15.1.13

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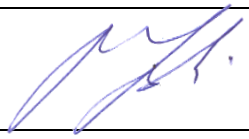
Mariusz Lipowski	30 %	ABDEG	

*** A** – przygotowanie projektu badania, **B** – przeprowadzanie badań, **C** – analiza statystyczna, **D** – interpretacja wyników, **E** – przygotowanie publikacji, **F** – opracowanie piśmiennictwa, **G** – pozyskanie funduszy

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OŚWIADCZENIE WSPÓŁAUTORÓW PUBLIKACJI

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OŚWIADCZENIE WSPÓŁAUTORÓW PUBLIKACJI

Kamionka, A., Lipowski, M., Lizińczyk, S., Sajewicz-Radtke, U., Radtke, B. M., Łada-Maśko, A., Olszewski-Strzyżowski, D., & Lipowska. M. (2024). The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring. *Baltic Journal of Health and Physical Activity, 16*(2), https://doi.org/10.29359/BJHPA.16.2.11

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CONFIRMATION

Agata Izydorczyk actively participated in the work of the research team under project financed by Nacional Science Centre in Poland (2015/17/B/HS6/04144) – *The development of beauty & health concepts and stereotypes in middle childhood*. Miss Izydorczyk's task was to collect survey data as well as anthropometric measurements of 8-year-old children and their parents.

KIEROWNIK PROJEKTU
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PHYSICAL ACTIVITY AND PSYCHOPHYSICAL WELL-BEING OF CHILDREN WITH DISABILITIES AND THEIR FAMILIES - A SYSTEMATIC REVIEW

Agata Kamionka, Mariusz Lipowski

Gdansk University of Physical Education and Sport, Poland

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Abstract

The goal of this paper is to examine the state of current research and the interests of researchers all over the world regarding the relationship between physical activity and psychophysical wellbeing (mental and physical health) of children with various types of disability in the context of physical activity in the family. A systematic literature research was conducted using the Cochrane Library, EBSCO, PsycInfo and PubMed databases. Available research articles published between 2010–2020 were searched for using the following keywords: motor disability, physical activity, child with motor disability, physical activity and disability, disabled child, psychophysical well-being, family, physical activity in the family. The goal was to find studies concerning children and adolescents aged 0–19 whose main disability was a motor disability. The available literature describes the positive influence of physical activity on children with cerebral palsy, motor deficits, and neurodevelopmental disorders. In the last decade (2010–2020) levels of intensity of physical activity have been measured with accelerometry using wearable equipment such as ActivHearts, ActiGraph and StepWatch, as well as the MVPA index. Physical activity is beneficial for children with different types and levels of disability, and it influences their families. It is necessary to support, promote, and educate families as well as their children with disabilities about physical activity.

Keywords*: physical education, students, shooting, improvement*

Introduction

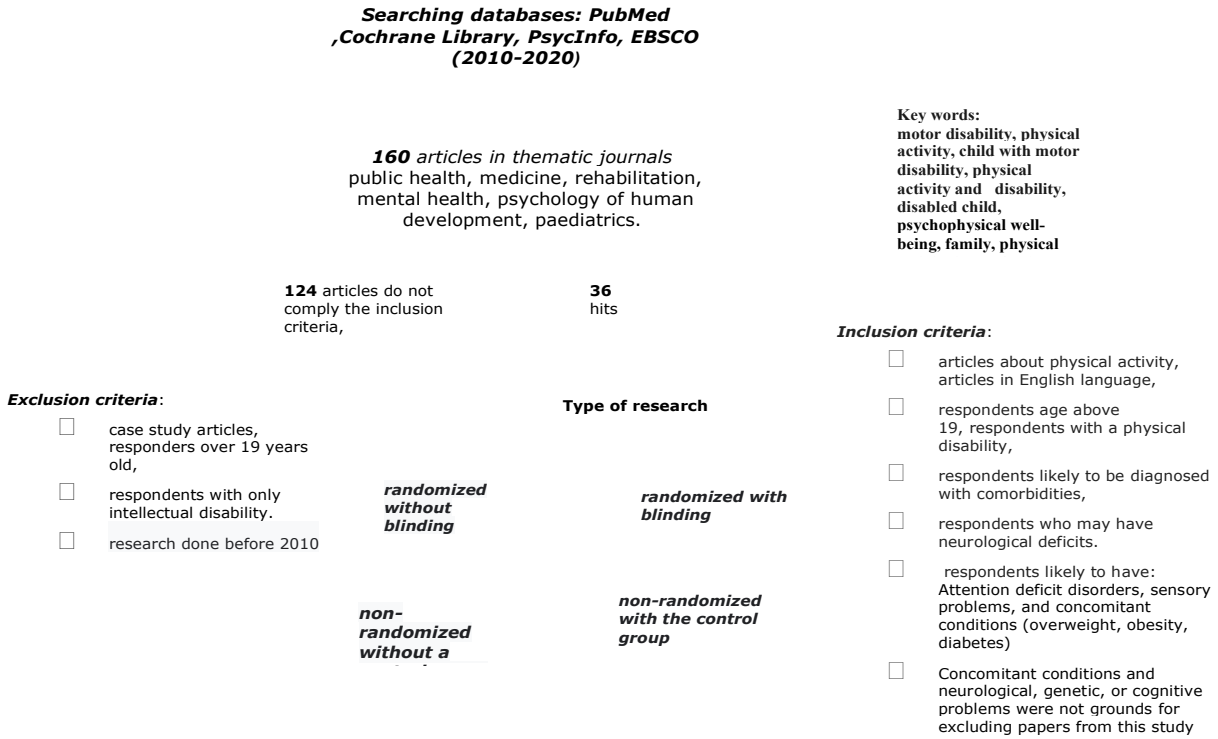
The problem of scientific measurement of the relationships between the types and specifics of everyday physical activity undertaken by and psychophysical wellbeing of children with motor disabilities at different stages of life is poorly documented in the literature. A review of the most recent research studies regarding this topic (from the years 2010–2020) indicates the relationship between physical activity and psychophysical wellbeing in children with motor disabilities and without intellectual deficits has received significantly less scrutiny than in their physically healthy counterparts (Williams et al., 2017; Bidzan-Bluma & Lipowska, 2018; Blanco et al., 2019; Fraysse et al., 2019; Lebron et al., 2018; Alharbi, 2019; Niemisto¨ et al., 2020). The current literature regarding healthy children without intellectual disabilities of different nationalities and ethnic backgrounds—e.g. white (Williams et al., 2017), Spanish (Blanco et al., 2019), Australian (Fraysse et al., 2019), Latino (Lebron et al., 2018), Saudi Arabian (Alharbi, 2019), American (Haidar et al., 2019), Scandinavian (Niemisto¨ et al., 2020)—shows a relationship between physical activity at different periods of life and the development of different problems associated with body mass (Niemisto¨ et al., 2020), including being overweight and/or obese, parents' BMI (Williams et al., 2017), specifics of parental attitudes and behaviors with regards to nutrition (Williams et al., 2017; Lebron et al., 2018; Alharbi, 2019), as well as a relationship between physical activity and the development of cognitive functions in children and adolescents (Bidzan-Bluma & Lipowska, 2018). In the studies of Williams et al., 2017, Lebron et al., 2018 and Alharbi et al., 2019, relationships between the physical activity of children and adolescents and other variables were measured using various indices collected using questionnaires, scales, and surveys completed by parents (questions targeted at both parents concerned BMI, diet, and time spent doing physical activity and being sedentary throughout the day). Fraysse et al., 2019, used the moderate to vigorous physical activity index (MVPA) to measure the relationship between the physical activity of children and their parents in a healthy population of 1261

Australian children (50% boys and 50% girls) and 1358 parents (88% mothers). Jung et al., 2018 used the MVPA index in their meta-analysis of levels of physical activity among children and adolescents (aged 4–20 years) with and without disabilities. Their findings suggest that differences between the levels of physical activity in adolescents with and without disabilities are complex. Jung et al., 2018 report that children and adolescents without disabilities show higher engagement and levels of MVPA than those who are disabled. World Health Organisation (WHO) recommendations (Fijałkowska, 2018; www1, 2010; www2, 2010; www3, 2020) use the MVPA index as a meaningful way to measure intensity of physical activity in healthy children for research purposes. The results of the aforementioned studies suggest the need to identify factors which work in favor of or against the development of physical activity in children, which is an important factor for the psychophysical wellbeing of both healthy (Williams et al., 2017; Bidzan-Bluma & Lipowska, 2018; Blanco et al., 2019; Fraysse et al., 2019; Lebron et al., 2018; Alharbi, 2019; Haidar et al., 2019; Tinner et al., 2019) and disabled children (Jung et al., 2018). Identifying the relationship between the physical activity of children and their psychophysical wellbeing is an important element of both education and healthcare interventions (Tinner et al., 2019). It is emphasized that physical activity plays an important role as a predictor of a healthy lifestyle, which is crucial for mental and physical health, especially in normally developing children and adolescents (Stępień et al., 2019; Kleppang et al., 2019). The goal of this paper is to examine the state of current research and the interests of researchers all over the world regarding the relationship between physical activity and psychophysical wellbeing (mental and physical health) of children with various types of disability in the context of physical activity in the family. In this review of the most recent literature, it was quite difficult to find any research on the relationship between physical activity and wellbeing in children with motor disabilities but without intellectual disabilities. For this reason, the authors wanted to pay special attention to this niche topic of research.

Methods

A systematic literature research was conducted using the Cochrane Library, PsycInfo, EBSCO and PubMed databases. Available research articles published between 2010–2020 were searched for using the following keywords: motor disability, physical activity, child with motor disability, physical activity and disability, disabled child, psychophysical well-being, family and physical activity in the family. Following the keywords given above, 160 publication matches were found. In the qualification process, 36 of them were isolated and thoroughly analyzed in the systematic review below (Figure 1). The topic of articles included in this review concerning the relationship between physical activity and psychophysical wellbeing of children with disabilities was considered in an interdisciplinary context, taking into account the use of physical activity in rehabilitation and psychology. Thus far, the review revealed the difficulty of finding research on the relationship between physical activity and psychophysical wellbeing in children with motor disabilities but no intellectual disabilities.

Figure 1. Flowchart of the selection of articles in a systematic review.



The studies which met the criteria for inclusion in the systematic review were a qualitative assessment having the nature of randomized without blinding, randomized with blinding, non-randomized without a control group and non-randomized with the control group studies. The research included in the systematic review was conducted on large groups of respondents. Only Spencer-Cavalier & Watkinson 2010 and Capio et al., 2010 had small study groups. Large study groups give the opportunity to learn about the phenomenon of AF and influence many levels in a given population of children with motor disabilities and their families.

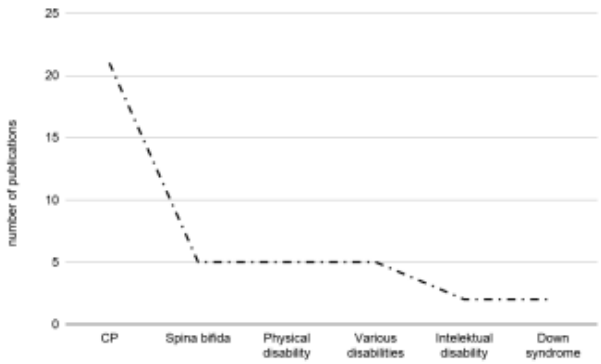
Studies concerning children with disabilities, potentially with concomitant conditions, were included in this review. A study's participants being aged above 20 years was an exclusion criterion. The authors state that it is worth doing research on a population of a similar age without a lot of discrepancies (Bloemen et al., 2017; Willis et al., 2018; Kalleson et al., 2019; Lauruschkus et al., 2015; Romero, 2019; Claridge et al., 2019; Howells et al. 2019; Cook et al., 2015; Spencer-Cavaliere & Watkinson, 2010). A child physical and mental development is very intensive and really diverse when we take various developmental stages into consideration. A huge age discrepancy can be helpful when we compare particular age ranges, however, it is difficult to find articles concerning a particular age range.

Publications were excluded if the main disability of the children in the study group was intellectual or cognitive or if there was no motor disability. Inclusion and exclusion criteria for participants in the reviewed literature were of similar character as those applied in this review. The severity of and type of disability were important. Inclusion criteria involved the GMFCS classification system (Mak et al., 2017; Clutterbuck et al., 2018; Lankhorst et al., 2019; Burak et al., 2019; Lavelle et al., 2020; Reedman et al., 2019; Cook et al., 2015; Wilson et al., 2016). Each publication discussed children with disability levels I-III based on the GMFCS. Most of the studies dealt with children diagnosed with cerebral palsy (Mak et al., 2017; Clutterbuck et al., 2018; Lankhorst et al., 2019; Burak et al., 2019; Lavelle et al., 2020; Reedman et al., 2019; Cook et al., 2015; Wilson et al., 2016), physical disability (Bloemen et al., 2017; Sit et al., 2019; Li et al., 2019), or spina bifida (Polfuss et al., 2019; Lankhorst et al., 2019; Jaarsma et al., 2015; Claridge et al., 2019; Forseth et al., 2019). Forseth et al. and Claridge et al. additionally included children with Down syndrome, while also studying children with spine bifida. Various types of disability without any primary condition were present in the works of Romero et al., 2019, Ross et al., 2020, Willis et al., 2018, Jaarsma et al., 2015, Haegele et al., 2018 and Jung et al., 2018. Authors listed orthopaedic surgery (Johnson et al., 2018; Clutterbuck et al., 2018; Lee et al., 2015), neurological disability, and botulism as well as behavioral and intellectual difficulties as exclusion criteria (Clutterbuck et al., 2018).

Clutterbuck et al., included intellectual difficulties as an exclusion criterion. The analyzed works were carried out on groups of people in a similar age, which positively influences the analysis of the research data in this review. The topics of the AF variables discussed are consistent in selected articles. It concerned the school environment and, above all, the family environment, addressing the issues of barriers and participation in AF. Additionally, the researchers emphasized the positive influence of AF on the psychophysical health of children with motor disabilities. It was difficult to find intellectual disability as an exclusion criterion in the analyzed literature, which is important for the niche character of the review. The majority of research groups of children with motor disabilities were diagnosed with CP.

The authors noticed some difficulties in relation to other types of disabilities in which the main deficit is motor disability. A particular attention should be paid to other diseases connected with motor dysfunction. Paying attention to niche groups of children with motor disabilities could extend scientific knowledge and constitute comparative procedures of research on physical activity and help creating programs based on physical activity for children with motor disabilities. Additionally, it is believed that examining other children with motor deficits will help a better research selection on a population of children with motor difficulties but within the intellectual norm. The graph presented below (Figure 2) shows the types of disabilities present in the studied groups in the reviewed studies.

Figure 2. The character of disability documented in the literature published between 2010–2020 analyzed in this systematic review assessing the relationship between physical activity and psychophysical wellbeing (mental and physical health) in children with motor disabilities.



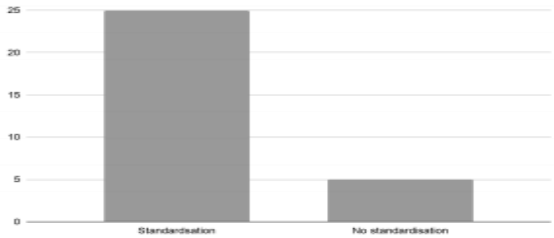
The following methodologies were most commonly applied in the reviewed studies: ICF, COMP, and accelerometry. (Table 1). These methods are objective and allow for quantitative and qualitative measure of levels of physical activity (accelerometry, ActiGraph, Stepwatch). COMP, ICF, and GAS allow for the assessment of participation and engagement in physical activity, complementing the above research methodology.

Table 1. Research methods used in studies concerning the relationship between physical activity and psychophysical wellbeing of children with motor disabilities and their families (2010–2020).

Methods	Number of publications
ICF	10
COMP	5
ACCELEROMETRY	4
ACTIV GRAPH	3
LEM	2
GAS	2
STEP WATCH	2
BEACHES	1
SUS	1
PHYSITRACK	1
IPAQ	1

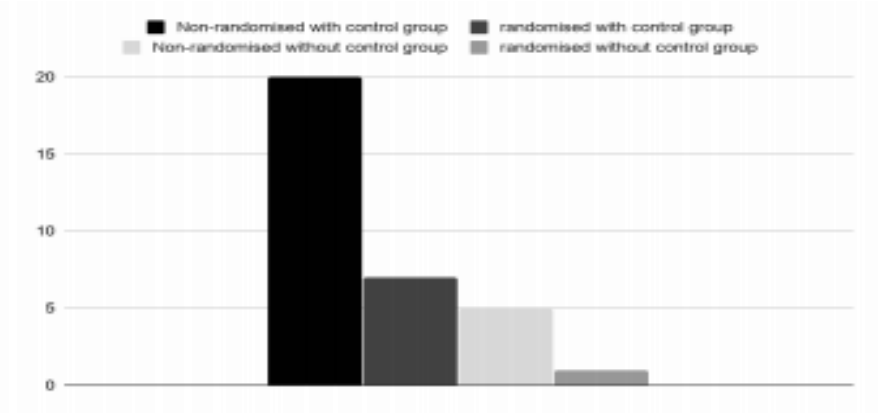
The use of standardized scales and classifications in the reviewed studies influences the methodological quality of the research, which influences the value of this review. Standardization of classification and scales used by the researchers allow for uniform research procedures in the studied groups and lends to the credibility/reliability of the studies (Figure 3). Standardized questionnaires and scales used on large populations are important for the credibility of the research and thus ensure the reliability of the obtained results. The scales used in the research and analysis of the issues of this systematic review are used in the world literature to study children, adolescents and adults, reducing the risk of methodological error and statistical analysis.

Figure 3. The number of publications using standardized scales and classifications.



The lack of standardized procedures will make objective research analysis and reference to other authors' results more difficult and this might result in the lack of unanimous assessment of the topic in the scientific world. Few of the reviewed studies used a randomized design (Figure 4). According to the authors it is worth extending a scope of topics by means of randomization of the research group. Indicated methodology could influence the quality of scientific research. Additionally, it is worth combining randomization together with a research group and benefit from randomness and blindness of research groups. The authors of the present review think that a well-prepared methodology of research would be more reliable and easier for the objective assessment. Randomized studies are of the greatest research value, however many works instead use standardized research procedures, which are also of high value for this systematic literature review. Non-randomized studies comprised the majority of the reviewed papers.

Figure 4. Number of publications with randomized design.



Only in some papers were the study groups blinded (Johnson et al., 2018; Clutterbuck et al., 2018; Cook et al., 2015). Significantly more publications used random selection of participants (Mak et al., 2017; Kalleson et al., 2019; Johnson et al., 2018; Clutterbuck et al., 2018; Wilson et al., 2016; Haegele et al., 2018). Cook et al., 2015, Johnson et al., 2018 and Clutterbuck et al., 2018 used blinded and randomized groups. The time periods in which the studies were conducted varied. The durations of the studies were chosen and controlled by the researchers. The authors of this review believe that the statistical methods used in the publications included in this review were reliable. To the knowledge of the authors, all relevant works have been identified by them, which indicates the niche characteristic of the topic of this review. The discussed publications show uniformity in selecting types of disability, age groups, and the used methodology as well as statistical analyses. The analyzed articles contained an abstract and full text. The authors conducted a diligent and comprehensive search of the above mentioned databases using the previously listed keywords. The impact factor for the magazines varied from 1.74 to 3.045. One of the publications found in a journal had an impact factor smaller than 1.0. Manuscripts published before 2010 and works not in the English language were also excluded.

Results and discussion

In our review of research articles published between 2010–2020 on the relationship between physical activity and psychophysical wellbeing of children of various ages with motor disabilities but no intellectual disabilities, we identified two separate categories analyzed in the literature that are discussed in this review:

1. Physical activity and type of child's motor disability.
2. Physical activity and the role of family environment of a child with disability.

Physical activity and type of child's motor disability

The available literature describes the positive influence of physical activity on children with cerebral palsy, motor deficits, and neurodevelopmental disorders (Bloemen et al., 2017; Mak et al., 2017; Willis et al., 2018; Wright et al., 2018; Kalleson et al., 2019; Wingo et al., 2020; Polfuss et al., 2019; Johnson et al., 2018; Clutterbuck et al., 2018; Lankhorst et al., 2019; Lauruschkus et al., 2015; Ross et al., 2020; Romero, 2019; Willis et al., 2018; Jaarsma et al., 2015; Burak & Kavlak, 2019; Lavelle et al., 2020;

Claridge et al., 2019; Sit et al., 2019; Reedman et al., 2019; Forseth et al., 2019; Darrah & Law 2011). Many of the studies discuss support programs for children with cerebral palsy (Bloemen et al., 2017; Mak et al., 2017; Willis et al., 2018; Wright et al., 2018; Kalleson et al., 2019; Johnson et al., 2018; Lankhorst et al., 2019; Lauruschkus et al., 2015), and emphasize significantly improving physical fitness and decreasing the severity of cardiopulmonary conditions (Bloemen et al., 2017).

Mak et al., 2017, designed an original yoga-based program, "Mi Yoga", which aims to holistically approach integrating the everyday life of the child and their family through physical activity. Howells et al., 2019, used a project associated with soccer-"All Play Pre-Learn"—in order to create an initiative to help children with physical disability (cerebral palsy) through sports. The studied group experienced the benefits of doing sports and integrating with other disabled children, as well as healthy children. An aspect important for the authors was to develop social and motor skills through physical activity associated with doing sports. Cook et al., 2015, used a gymnastics program named "CAN-flip" for children diagnosed with cerebral palsy. Motor exercises (hopping, running, climbing, walking up stairs) improved the physical activity levels of children with cerebral palsy whose motor disabilities were assessed at levels I-III on the Gross Motor Function Classification System (GMFCS). The goal of the CAN-flip program was to highlight the lack of structured physical activity programs based on gymnastics (Cook et al., 2015).

One study identified the most popular types of physical activity in after-school recreational classes. These were: swimming, cycling, and soccer. Jaarsma et al., 2015, studied a group of children with spina bifida and cerebral palsy and found that undertaking sports is difficult for children with severe motor disability. However, encouragement and appropriate choice of activity for children with disabilities reduces the external barriers and influences the psychophysical condition of the child (Jaarsma et al., 2015). Wright et al., 2018 also mentioned swimming as one of the most popular physical activities. They highlighted the barriers associated with physical activity which children with cerebral palsy are met with, especially those regarding their physiological limitations (fatigue, pain, and physical limitations associated with the disability) as well as psychological (e.g. low self-esteem or lack of confidence) and personal limitations (such as lack of motivation). Frequently, these barriers prevent disabled children undertaking physical activity (Wright et al., 2018). The desires to move, be active and to integrate with other participants (taking part in the game) are important for children with physical disabilities. Spencer-Cavaliere & Watkinson, 2010, investigated the perspectives of children with disabilities on inclusion in physical activity. Lauruschkus et al., 2015 modified the PAR questionnaire in order to investigate levels of and involvement with physical activity among children with cerebral palsy. They included activities such as: wheelchair hockey, cycling, and table tennis. Willis et al., 2018, as well as Lauruskus et al., 2015, additionally used measurement tools such as the Canadian Occupational Performance Measure (COPM) and The Goal Attainment Scale (GAS). Both research groups studied children diagnosed with cerebral palsy. In the last decade (2010–2020), levels of intensity of physical activity have been measured with accelerometry (Lavelle et al., 2020; Sit et al., 2019; Reedman et al., 2019) using wearable equipment such as ActivHearts, ActiGraph (Lavelle et al., 2020; Claridge et al., 2019) and StepWatch (Capio et al., 2010; Wilson et al., 2016), as well as the MVPA index (Lavelle et al., 2020; Claridge et al., 2019; Sit et al., 2019; Reedman et al., 2019; Li et al., 2017). Studies which use this index (Claridge et al., 2019; Sit et al., 2019; Li et al., 2017) indicate that children with motor disabilities are characterized by lower physical activity than healthy developing children. Li et al., 2017 observed that the gender of children significantly differentiates MVPA levels and Claridge et al., 2019 reported that children with motor disabilities are characterized by spending more time being sedentary than healthy children. This difference was statistically significant. Sit et al., 2019, also noted that there were no statistically significant differences in terms of the seasons in which physical activity was undertaken, however they emphasized that children with motor disabilities do not fulfill the WHO recommendations about daily physical activity requirements. This is why the MVPA index was lower in this group. Sit et al., 2019 and Li et al., 2017, investigated levels of MVPA in school environments. Children with disabilities exhibited higher MVPA during physical education classes (Sit et al., 2019), while Li et al., 2017 found that children with motor deficits exhibited low levels of MVPA in school and outside of school. Statistically significant differences were observed between genders and depending on levels of motor disability. Boys were more active than girls. Similarly, children who were able to walk without assistance were more active than those who could not (Li et al., 2017).

Sit et al., 2019, Reedman et al., 2019 and Lavelle et al., 2020, used accelerometry to measure levels of MVPA. Lavelle et al. and Reedman et al. studied children with cerebral palsy in different age groups (8–12 Reedman et al., 2019; 10–19 Lavelle et al., 2020) classified using GMFCS as belonging to the I-III motor disability severity group. Children from the first age group increased their MVPA due to external intervention (Reedman et al., 2019). Children aged 10–19 had lower levels of MVPA than

indicated by the International Physical Activity Questionnaire – Short Form (IPAQ-SF), which they completed. Lankhorst et al., 2019 used the Activ8 activity monitor and did not measure the MVPA index. As in the described studies (Lavelle et al., 2020; Sit et al., 2019; Reedman et al., 2019), they studied children with cerebral palsy, although they additionally included children with spina bifida. Wilson et al., 2016 and Capio et al., 2010 analysed children diagnosed with cerebral palsy using the STEPWATCH wearable activity monitor. They studied similar age groups and concluded that children with motor disabilities are characterized by low, varied physical activity during weekends. Keawutan et al., 2018 concluded that children with cerebral palsy have lower habitual physical activity (HPA) than their healthy peers. Accelerometry was used to measure HPA and sedentary time, while the Pediatric Evaluation of Disability Inventory (PEDI) allowed parents to assess the quality of the mobility of their children with disabilities. Keawutan et al. observed that children classified as GMFCS III-V spent more time being sedentary than children from the GMFCS I group. Oftedal et al., 2012 undertook a review of the methods of physical activity measurement used in studies on young children to assess the validity and reliability of clinometric properties of habitual physical activity measures. It was observed that in the available literature (Bloemen et al., 2017; Mak et al., 2017; Johnson et al., 2018; Clutterbuck et al., 2018; Burak & Kavlak, 2019; Lavelle et al., 2020; Reedman et al., 2019; Darrah & Law, 2011; Cook et al., 2015; Wilson et al., 2016; Keawutan et al., 2018) the GMFCS scale was used to classify children with motor disabilities. In the literature from the years 2010–2020 (Bloemen et al., 2017; Willis et al., 2018; Wright et al., 2018; Clutterbuck et al., 2018; Willis et al., 2018; Jaarsma et al., 2015; Burak & Kavlak, 2019; Darrah & Law, 2011), physical activity in disabled children (mostly with cerebral palsy) was also discussed in the context of the International Classification of Functioning, Disability, and Health (ICF). Clutterbuck et al., 2015 and Willis et al., 2018 discussed every domain of the ICF classification. Willis et al., 2018 highlighted the importance of family interventions for physical activity through the levels of ICF. According to Willis et al., complementing the ICF with the COPM and GAS can aid the assessment of the results of rehabilitation interventions for children with disabilities. The researchers believe that these scales complement each other, providing a holistic image of the levels of activity of children with disabilities (Willis et al., 2018; Nyquist et. al., 2018). Clutterbuck et al., 2018 used the SPORTS STARS program to investigate the influence of physical activity on all domains of the ICF. Other authors—Wright et al., 2018 and Li et al., 2017—focused on the importance of environmental factors (using the scale discussed above), which can potentially increase physical activity among children with motor disabilities. Wright et al. observed that interventions, planning, and appropriate adjustment of external factors (equipment, place, parental support) can lead to an increase in levels of physical activity in children with motor deficits. Bloemen et al., 2017, Darrah et al., 2011 and Lee et al., 2015 assessed the quality of physical activity using the "participation" and "activities" ICF components. All these researchers studied children diagnosed with cerebral palsy. With the use of ICF, Jaarsma et al., 2015 showed that external factors may constitute a barrier for undertaking physical activity. Motor activity comes at a big energetic cost for disabled children, which, according to the authors, also influences their participation. Willis et al., 2018 studied the specialist Local Environment Model (LEM) intervention program, combining it with the ICF classification. The authors wanted to assess the strategies for involving disabled children in physical activity. The researchers identified five mechanisms important for children with motor disabilities to undertake physical activity (choice, fun, friends, specialized health professionals, time) and discussed them in the context of each of the ICF domains. Burak et al., 2019 used the short form of the ICF to study children with cerebral palsy and made observations which suggest that environmental factors have low to moderate influence on physical activity.

Physical activity and the role of the family environment of a child with disability

Family intervention (behaviors promoting physical activity) can increase levels of physical activity in children with disabilities, especially motor disabilities (Wright et al., 2018; Kalleson et al., 2019; Polfuss et al., 2019; Ross et al., 2020; Foresth et al., 2019). Children and adolescents with disabilities often report low levels of physical activity. Ross et al., 2020 assessed the probability of engaging in physical activity depending on the status and type of disability after taking household factors into account. They found that children with disabilities were significantly less likely to get appropriate levels of physical activity than their non-disabled peers. Haegele et al., 2018 did not observe differences in levels of physical activity between children with and without disabilities. Their study focused on the presence of excess weight among children with and without disabilities. They investigated the relationship between physical activity and the child and caregiver being overweight or obese, taking into account the caregiver's bodyweight and income. The odds of the disabled child being overweight or obese increased when their caregiver exhibited body mass issues. Being overweight or obese was more common in

children with disabilities than in their healthy counterparts (Haegele et al., 2018). Romero, 2019 also emphasized that low levels of physical activity in children with disabilities are linked with obesity, and a parents' engagement in their own and their child's physical activity plays a significant role in determining the child's body mass. Wingo et al., 2020 reported that disabled children had a more sedentary lifestyle and unhealthy diet compared to children with no disabilities. They used an e-health program combined with telecoaching. According to the authors, difficulties associated with lack of physical activity and poor diet increased the caregiver's burden and costs of healthcare. Innovative interventions are needed to help caregivers of physically disabled children to improve health behaviors (Wingo et al., 2020). Similar conclusions were made by Zwinkels et al., 2020, who observed that physical activity influenced the weight and self-esteem of disabled children and that physical health and psychosocial attention is lower in disabled children than in their healthy peers. Forseth et al., 2019 as well as Polfuss et al., 2019 included children with spine bifida in their research, investigating their family environment. Forseth et al. had parent's fill-in physical activity journals for their children. The ability to write in such a journal may vary in children with special needs, as their motor abilities vary. Polfuss et al. took into account the planning of parental care and the emotional aspects of being a parent of a child with physical disability. Their research revealed a strong relationship between planning and the emotional wellbeing of a parent and physical activity of the child, which in turn influenced the child's body mass. Parents of children with disabilities report fear and anxiety and the desire to ensure safety for their physically disabled children (Li et al., 2017). Caregivers want to ensure safety during physical activity and report difficulties organizing appropriate activity for their children. Careful documentation is important for identifying the structure of the problem of educating parents and children with disabilities about physical activity and engaging them in it (Bloemen et al., 2017; Li et al., 2017). According to Wright et al., 2018, planning physical activity programs fosters the success of a child's involvement in physical activity. Lack of family engagement is a barrier to a child undertaking physical activity. Shields & Synnot, 2016 reported that attitudes of individuals close to children with disabilities, such as families, instructors, and peers, were perceived as key to their participation in physical activity by all groups of subjects (including children diagnosed with cerebral palsy). Kalleson et al., 2019 observed a high level of parental initiative in family and professional environments. The observed relationship also revealed the importance of targeting and adjusting services to meet the needs of families of disabled children. Wakely et al., 2018 investigated the accessibility of physical activity for children from different areas (villages/cities). The availability of transport for children with different types and severities of disability influenced the accessibility of physical activity. No differences were reported in the literature regarding the area of residence. Children with disabilities who lived in the countryside were met with similar barriers to those from metropolitan areas. Family interventions and encouraging families to take part together in physical activity increased levels of physical activity in children with disabilities (Romero, 2019). Johnson et al., 2018 highlighted the benefits of exercise done at home using the Physitrack program for complementing the intensity of the rehabilitation process and as an intervention for disabled people who are geographically isolated in different areas of villages and cities. The above publications indicate the positive influence of physical activity on children with disabilities. Çelik et al., 2018 investigated the physical fitness and wellbeing of siblings of disabled children. Teenagers with disabled siblings were characterized by lower physical activity and worse psychological wellbeing than siblings of healthy children, even though children who had a disabled sibling were not themselves less physically able than those who had only healthy siblings (Çelik et al., 2018). Hurley et al., 2018 investigated the role of parents/caregivers in the willingness of children with disabilities to take up physical activity. Parents indicate increased demand for services related to physical activities involving social interactions, which could benefit the social interactions of both their disabled children and themselves. They reported challenges and stress factors associated with insufficient support or education in terms of the ability to organize physical activity outside of school. They studied children with disabilities from the autism spectrum, down syndrome, and developmental disabilities, which are not assessed in this review, however Hurley et al., 2018 emphasize the importance of the role of caregivers in initiating physical activity. Parents/caregivers are usually integral social factors in children choosing and engaging in physical activity and are the main source of information about children's motor and social competences. The below table (table 2) summarizes the available studies from years 2010–2020 regarding the selected topics in this systematic literature review.

Table 2. Review of studies which discuss the relationship between physical activity and psychophysical wellbeing of physically disabled children and their families (published between 2010–2020).

Author Year	Study group	Investigated variables	Methods of measurement
Capio et al., 2010	Cerebral palsy Ages: 0–18 years	Physical activity measurement	Activities Scale for Kids – Performance version (ASKp), the Canada Fitness Survey, the Children's Assessment of Participation and Enjoyment/Preferences for Activities of Children (CAPE/PAC), the Compendium of Physical Activities, the Physical Activity Questionnaire – Adolescents (PAQ-A), StepWatch, and the Uptimer
Spencer-Cavaliere et al., 2010	Cerebral palsy, muscular dystrophy, myopathy Ages: 8–12 years	Participation in physical activity	Interview
Darrah et al., 2011	Cerebral palsy Ages: 1–5 years	Participation and activities	ICF
Oftedal et al., 2012	Neuromuscular diseases Age: 6 years	Habitual physical activity (HPA)	Consensus-based Standards for the selection of health status Measurement Instruments (COSMIN)
Lee et al., 2015	Cerebral palsy Ages: –	Participation and activities	ICF
Cook et al., 2015	Cerebral palsy Ages: 6–12 years	Feasibility of a gymnastics program	CAN-flip program, International Physical Activity Questionnaire (IPAQ), stadiometer, digital scale, Children's Self-Perceptions of Adequacy in and Predilection for Physical Activity (CSAPPA) scale, Gross Motor Function Measure (GFMF), range of motion (ROM), goniometer, dynamometer, Electromyography (EMG)
Lauruskus et al., 2015	Cerebral palsy Ages: 7–12 years	Assessment of feasibility of an individualised PAR system for physically disabled children	Individual and focus group interviews; GMFCS
Jaarsma et al., 2015	Cerebral palsy, spina bifida, muscular diseases, vision impairment, intellectual disability Age: 14 years	Participation in physical activity, barriers to undertaking physical activity	ICF, mixed methods (qualitative and quantitative)
Shields et al., 2016	Cerebral palsy, intellectual disability, vision impairment Ages: 6–18 years	Participation in physical activity, barriers to undertaking physical activity	Discussion group
Wilson et al., 2016	Cerebral palsy Ages: 6–18 years	Step count	StepWatch activity monitor
Wakely et al., 2017	Caregiver/parent of child with disability (unspecified disability)	Perception of a child's participation in physical activity by a parent/caregiver	Mixed methods, pilot methods

Li et al., 2017	Physical disability (cerebral palsy) Age: 15 years	BMI, MVPA	Behaviors of Eating and Activity for Children's Health: Evaluation System (BEACHES), ICF
Bloemen et al., 2017	Physical disability, cerebral palsy Ages: 4–18 years	Physical activity levels, physical activity intervention	Quantitative interventional study
Mak et al., 2017	Cerebral palsy Ages: 6–16 years	Attention control, physical functioning in physical activity, behavior, and mood	Mi Yoga program
Willis, Nyquist et al., 2018	Various disabilities (48% cerebral palsy) Ages: 5–12 years	Assessment of changes in participation in physical activity by disabled children after a goal-oriented intervention	COPM, GAS, ICF, LEM
Willis et al., 2018	No main type of disability Age: 12 years	Environment-focused intervention in physical activity	ICF,LEM, context-mechanism-outcome framework (CMO), ethnographic methods
Wright et al., 2018	Cerebral palsy, muscular dystrophy, chromosomal aberrations, spinal muscular atrophy Ages: 10–17 years	Barriers to and factors facilitating physical activity from the perspective of young disabled individuals and their families	Open survey questions ICF, CollectABILITY by Novita
Johnson et al., 2018	Cerebral palsy Ages: 6–17 years	Adherence to programs of home exercise among school aged disabled children	Physitrack program, journal, phone interview, videotaping, COPM, Physical Activity Enjoyment Scale (PACES), Numeric Rating Scale (NRS), System Usability Scale (SUS)
Clutterbuck et al., 2018	Cerebral palsy Ages: 6–12 years	Comparison of the efficacy of the SPORT STARS group with standard care in all the domains of ICF	COPM, Functional mobility scale (FMS), CONSORT guidelines, ICF
Haegele et al., 2018	Various disabilities, physical disability, chronic conditions/chronic disability Age: 9 years	Participation in physical activity, obesity and overweightness	BMI, questionnaires and home interviews with children, parents, teachers, and school headmasters
Jung et al., 2018	Various disabilities Ages: 4–20 years	Physical activity levels	MVPA, quantitative measurement of activity

Keawutan et al., 2018	Cerebral palsy Ages: 4–5 years	Relationship between HPA and sedentary time	HPA, GMFM
Kalleson et al., 2019	Cerebral palsy Ages: 12–57 years	Empowerment of families who need extra support	Family Empowerment Scale(FES)
Howells et al., 2019	Cerebral palsy, ADHD, one child with Down syndrome Ages: 5–11 years	Influence of physical activity, integration of participants in physical activity	ICF, COPM, "All Play Pre-learn"
Bowman et al., 2019	Cerebral palsy Ages: >2 years	Perception of the Baby Club program by parents of disabled children	Interview, short demographic questionnaire
Romero et al., 2019	Type of disability not specified Ages: 6–22 years	Investigating the influence of a 5-session educational program about physical activity on the self-efficacy of parents on facilitating independent physical activity for their disabled children	5-session physical activity educational program, Self-efficacy scale5-session physical activity educational program, Self-efficacy scale
Forseth et al., 2019	Spina bifida, Down syndrome Ages: >13 years	Measurement of energy expenditure in children with and without special needs	Daily activity journal
Claridge et al., 2019	Spina bifida Ages: 10–18 years	Active and sedentary time in children with spina bifida	MVPA, ActiGraph or Actiheart, Hoffer classification
Lankhorst et al., 2019	Cerebral palsy, spina bifida Age: 14 years	Measurement of static activities (done while sitting and standing) and dynamic activities (walking, running, cycling)	Accelerometry, Activ 8, FMS, Hoffer classification
Polfuss et al., 2019	Spina bifida, Down syndrome Ages: 5–16 years	Body mass, parental self-care, physical activity	Bronfenbrenner's Ecological Systems Theory, interview, phonecalls
Burak et al., 2019	Cerebral palsy Ages: 14–18 years	Quality of life, physical activity	Disability and Health Child-Youth Version Short Form (ICF-CY), BMI, GMFM, Manual Ability Classification System (MACS), GMFCS PEDSQL, WeeFim
Sit et al., 2019	Various disabilities, physical disability age: –	Seasonal changes in physical activity and sedentary lifestyle	Accelerometry, MVPA
Reedman et al., 2019	Cerebral palsy Age: 8–12 years	Effectiveness of therapy aimed at participation in habitual physical activity	MVPA, HPA, accelerometry

Lavelle et al., 2020	Cerebral palsy Ages: 10–19 years	Feasibility, acceptability and efficacy of resistance training in adolescents with cerebral palsy	IPAQ-SF, ActiGraph, MVPA, accelerometry
Zwinkels et al., 2020	Physical disability Ages: 8–19 years	Influence of school sports programme on psychosocial health and attention	Condition-generic module assessing health-related quality of life in children and adolescents with chronic conditions (DISAB KIDS Chronic Generic Measure; DCGM-37)
Ross et al., 2020	Physical, cognitive, & sensory disabilities	Level of participation and engagement in physical activity	National Survey of Children's Health, multidimensional logistic regression

Discussion

There is a relationship between physical activity and the psychophysical wellbeing (mental and physical health) of children with various types of disabilities. Family environment and family interventions also play an important role in creating and undertaking physical activity.

Lauruschkus et al., 2015 emphasized that family support facilitates the participation of children with MPD in AF. Wright et al., 2018 also discussed a similar mechanism of supporting children with MPD reaching the same conclusions that the environment of a child with motor disabilities has a large impact on eliminating potential barriers and undertaking AF. Wright et al. emphasized that changes in pro-health behaviors influencing the children motivation with disabilities and their families to undertake AF are important (Wright et al., 2018; Lauruschkus et al., 2015).

Interviewing alike parents and the child is crucial in the mechanism of including children with disabilities in free physical activity outside the family and school environment (Spencer-Cavaliere & Watkinson, 2010). Talking to the child and parent is important for third-party intervention in creating opportunities for AF. An interview with questions about well-being is important in creating the right conditions for AF. Although the questions included in the interview may be subjective and differ in individual research procedures, they are important for getting to know the environment of a particular family, enabling the observation of the mechanisms of barriers and participation in AF of a disabled child and his family. Parents, despite their subjective feelings, can be valuable informants for researchers. Interview and getting to know the respondents' environment is important for the research procedure, however, it is also important to objectify the obtained data.

ICF (International Classification of Functioning, Disability and Health) is an extensive tool for assessing the environmental and individual factors of people with disabilities. Jaarsma et al., 2015 Willis et al., 2018, Lee et al., 2015, Howells et al., 2019 and Burak & Klavak, 2019 by using the ICF classification in their research projects, came to similar conclusions. The mechanism of intervention of the family environment influences individual factors, including the motivation to undertake AF in children with disabilities. Burak and Kavlak used the shortened ICF form on the population of children with MPD. Not only is the full ICF form valid for assessing the functioning of children and adults with disabilities. Burak and Kavlak found that the short form is compatible with other research tools and is suitable for assessing the health of children with MPD (Burak & Kavlak, 2019).

Lee et al., 2017 using also ICF-CY, investigated the quality of gross motor skills and participation in AF of children with disabilities. The shortened form may allow to reduce the research time and thus reduce the risk of the respondents being unmotivated to participate in the research project. Clutterbuck et al., 2018 Lee et al., 2017 Willis et al., 2018 combined the ICF classification with other standardized scales and questionnaires in the research procedure, reaching the conclusion that without a family environment there is no effective intervention to motivate and undertake AF by a disabled child. It is not only the assessment of the environment and individual factors that is important for a disabled child to undertake AF. An important aspect is the objective measurement of the AF intensity. Li et al., 2017, Jung et al., 2018, Claridge et al., 2019, Lankhorst et al., 2019 and Reedman, 2019 used the MVPA index to measure the variable, concluding that the child's activity depends on the parent's AF. Children with disabilities are less active than healthy children. Their activity depends on

environmental intervention and on the barriers that their families and themselves face (Lankhorst et al., 2019; Reedman et al., 2019; Li et al., 2017).

Creating proprietary programs (Mak et al., 2017; Romero, 2019; Forseth et al., 2019; Howells et al., 2019; Cook et al., 2015) is an individual mechanism aimed at facilitating the participation in AF and the sense of belonging of children with motor disabilities among a group of peers.

Li et al., 2017 conclude that gender was important to the increase in MVPA. Boys showed higher levels of MVPA than girls. Jung et al., 2018 performing the meta-analysis, they did not notice any differences in the increase in the index referring to sex, however, the age of the respondents and the intensity of physical activity turned out to be important for the increase in MVPA (Li et al., 2017). Lavelle et al., 2020 also emphasized that age is a predictor of differences between the MVPA value. Young people with MPD in the study by Lavelle et al. declared a higher level of MVPA than indicated by the accelerometer measurement. The mechanism of increasing and decreasing MVPA levels depends on individual factors such as age and gender. Environmental factors are important to create appropriate conditions for children with physical disabilities to undertake AF. Subjective feelings of the intensity of undertaken activity are important for the study group, however, they are not commensurate with the objective results of MVPA measurements.

Strengths and Limitations

The research included in the review was conducted on a large group of respondents (Sit et al., 2019; Burak & Kavlak, 2019; Willis et al., 2018; Nyquist et al., 2019; Romero, 2019; Clutterbuck et al., 2018; Wingo et al., 2020; Kalleson et al., 2019; Willis et al.,2018; Nyquist et al.,), providing a reliable assessment of the mechanisms illustrating the undertaking of AF and the assessment of its intensity. A large study group influences the quality of the conducted statistical analyzes. A small group of researchers (Lauruschkus et al., 2015; Forseth et al., 2019; Howells et al., 2019; Spencer-Cavaliere & Watkinson, 2010; Capio et al., 2010), conducted research on a small group of respondents. A small number of respondents was associated with Cook et al., 2015 and Howells et al., 2019 with the proprietary program and the criteria for inclusion in the research program. Small groups of respondents (Lauruschkus et al., 2015; Forseth et al., 2019; Howells et al., 2019; Spencer-Cavaliere & Watkinson, 2010; Capio et al., 2010) gave the possibility of an individual, detailed knowledge of the environmental situation and the level of AF in individual units. The large discrepancy in the age of the respondents influences the heterogeneity of the examined mechanisms of taking up and determining the barriers to AF. Individual factors influence the intensity of child AF, however environmental variables determine access to it. External factors can be changed so that scientists can improve the programming of physical activity. Individual features cannot be changed, which significantly affects the quality of AF. The motor disability is different for each child despite the same disease entity. Each movement deficit affects the physical activity of a disabled child differently. The different movement deficit may affect the research procedure and the research tools used to determine the intensity, quality and motivation of AF in a child with motor disability.

The analysis of the research results included in review is consistent and the researchers defined the variable AF in various aspects. There is insufficient information on the quality of physical activity in children with an exclusive movement deficit and the impact of AF on the quality of life of the whole family.

Conclusion

Physical activity is beneficial for children with different types and levels of disability, and it influences their families. It is necessary to support, promote, and educate families as well as their children with disabilities about physical activity.

Based on the papers identified in this systematic literature review, we conclude that it is worthwhile to further study children with motor disabilities but without intellectual impairments and their family environment in the context of levels of and engagement in physical activity.

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The impact of parents' physical activity goals and parental attitudes on physical activity during leisure time among children in middle childhood

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Introduction: Parents' supportiveness and health-promoting habits significantly affect the intensity of children's physical activity (PA) and the involvement of parents in their engagement in PA; in this domain, both the hours devoted to PA and PA goals can be assessed. The family plays an important role in shaping the physical and social organization of the environment for children aged 4–6 years.

Methods: A total of 680 families with 5-year-old children (330 girls, 350 boys) took part in the study. Data were collected from these participants, who were recruited from preschools and primary schools in the Pomeranian region of Poland. The aim of this study was to determine whether the involvement of parents in PA mediates the influence of parental attitudes on the ways in which their children spend their leisure time.

Results: The results showed that not all parental attitudes had direct impact on children's leisure time in PA and outside PA. Other aspects parental attitude had no significant impact on offspring's free time. Among fathers, only four aspects of parental attitude (namely, acceptance–rejection, inconsistency, autonomy, and overprotectiveness) had an impact on PA goals. Mothers' goals were influenced by the strength of a larger number of aspects of attitude (namely, acceptance–rejection, autonomy, inconsistency, over-demandingness, and overprotectiveness). Similarly, the strength of mothers' and fathers' acceptance–rejection attitudes, attitudes of autonomy, and overprotectiveness had an impact on their PA goals but were not directly linked to their children's leisure-time engagement in PA.

Discussion: Not all parental attitudes have a direct impact on children's PA or non-PA leisure time. However, the goals of PA parents have been recognized influence the leisure time of children in PA and outside PA. The most statistically significant relationship for both mothers and fathers was between parental attitudes and PA goals. Parental attitudes do not play a significant role in explaining involvement in PA or lack of it in leisure time among 5-year-old children.

KEYWORDS

parent-child relationship, sport in leisure time, physical activity in families, parental attitudes, behavior modeling

1. Introduction

Physical activity (PA), defined as any type of PA practiced at any skill level and for the enjoyment of the individual, is an important part of a healthy lifestyle for both adults (1–4) and children (5, 6). Research has shown that exercise has a positive influence on body weight (7, 8), mental health (9), cognitive functioning in children and in older adults (10–12), general self-esteem (13), and quality of PA in children (14). Additionally, the support of parents and their own health-promoting habits significantly affect the intensity and quality of PA undertaken within a family (15–17). The family plays an important role in shaping the physical and social organization of the environment for children aged 4–6 years (18, 19). Preschool (20, 21) and school (22–24) also significantly influence a child's relationship with exercise. Children's engagement in PA, especially that of children attending kindergarten, is largely dependent on adult caregivers who provide them with opportunities for PA (25).

The ways in which children spend their leisure time depend on their parents' involvement in PA and their health habits (17, 26). Parental behaviors in relation to their children's PA provide insight into how family lifestyles influence the effectiveness of family-based interventions. There is a clear, measurable relationship between parents' and children's PA and the quality of their leisure time while sedentary (27, 28). It is very difficult to find literature reporting on the ultimate effects of family-related factors on PA among 6-year-old children. However, it is known that a sedentary lifestyle among 5-year-old children leads to body weight issues and affects the quality of PA. Increasing numbers of children are obese or overweight, thereby reducing their PA (29). Epidemiological reports from Europe, the USA, and other parts of the world indicate that children are devoting less time to PA (30).

Regular exercise in childhood becomes a habit and translates into pro-health behaviors in adult life (31). A 2018 study of Polish children showed that only 20% of children meet the requirements for daily PA and participate in organized sports activities. It is concerning that only 50% of parents encourage their children to undertake such activities (32). In 2017, the intensity of physical exertion among the adult Polish population was found to be mostly low, at 56% (33). The European Obesity Monitoring Project (34) found that young children spend significant amounts of time in front of the TV and computer. Furthermore, 80% of children and adolescents between 5 and 17 years of age do not participate in sufficient PA. Data from the WHO suggest that one in four adults does not participate in sufficient PA.

Moreover, as countries grow economically, levels of inactivity among the population increase and can reach as high as 70%. Increased levels of physical inactivity have a negative impact on healthcare systems, the environment, economic development, community welfare, and quality of life (30). The relationship between physical activity and parental attitudes is an interesting and important one; exploring this connection can potentially lead to opportunities for improved education of parents and preventative measures related to the quality of PA during family leisure time.

An important way in which parents influence their children is through their attitudes, which can be understood as a cognitive–aspirational–affective framework acquired by parents that shapes their behavior toward their child (35). Researchers have developed various typologies of parental attitudes, with the terrestrial typology being the most well-known, as referenced by Plopa. This typology classifies parental attitudes into five distinct types: (1) acceptance–rejection: under acceptance, a parent unconditionally accepts the child as they are, teaches the child acceptance of others, and instills in them a sense of trust for the world and people, while under a parental attitude of rejection, interaction with the child does not give the parent pleasure and satisfaction; (2) overly demanding attitude: the parent demands absolute obedience and submission from the child, not relenting in the face of opposition and criticism, and accepts only those of the child's plans, actions, and aspirations that are consistent with the parent's views, expectations, and ideas; (3) attitude of autonomy: the parent understands the child's growing need for independence and development, and treats the child sensitively and in accordance with their age and abilities; (4) inconsistent attitude: the parent's attitude toward their child is unstable, depending on their own mood or well-being, which seeps into interpersonal relationships in the family; and (5) overprotective attitude: the parent, guided by their belief in love for their child, cares too much about their child and wants to know about everything that concerns them (36).

The family as a system creates an internal environment that shapes parental behavior and the functioning of the child (37). In the literature, the sex of the parent is reported to be a significant variable that influences the parental attitudes presented to children. Mothers and fathers may present similar or different attitudes toward their children in different areas of their lives. It has been observed that, when preparing a child for school, most mothers adopt a democratic attitude, followed by an overprotective attitude, then a liberal attitude, and finally, an authoritarian attitude. Fathers present a similar pattern in the attitudes they adopt toward their children (38). Lipowska et al. (39) demonstrated that both mothers and fathers are most characterized by inconsistent and demanding attitudes and least by overprotective attitudes and attitudes of autonomy. Mothers exhibit acceptance–rejection attitudes, demanding attitudes, and attitudes of autonomy at higher rates than fathers (39). There is a slightly significant relationship between authoritarian parenting attitudes and children's play behaviors and behaviors related to social competencies (40). Parental attitudes affect various spheres of a child's life, in particular the types of activities undertaken, and are important for the education that occurs within the family (37).

1.1. Goals and hypotheses of this study

The aim of this study was to determine whether the involvement of parents in PA mediates the influence of parental attitudes on the ways in which their children spend their leisure time. To this end, we formulated two hypotheses:

Hypothesis 1. Parental attitudes impact how much of their leisure time children spend engaging in PA.

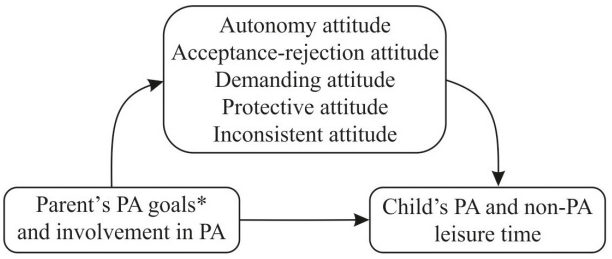

FIGURE 1
A mediation model for the parent–child dyad. *Parents' goals: (1) health (right levels of: blood pressure, cholesterol, body mass, etc.); (2) physical fitness, being "in shape"; (3) company of other people (4); fit, shapely body (beauty, sculpted and firm body); (5) well-being; (6) being physically active and fit according to fashion; (7) boosting confidence, gaining appreciation from others; (8) pleasure from physical activity; (9) escape from everyday life; (10) managing stress; (11) fulfilling the need for activity; and (12) promoting physical activity by setting a behavior example.

Hypothesis 2. Parents' own PA goals and involvement in PA mediate the relationship between parental attitudes and how their children spend their leisure time.

We created a mediation model for dyads of parents and children, representing these hypotheses about the relationships between the variables (Figure 1).

2. Materials and methods

2.1. Participants

A total of 680 families with 5-year-old children (330 girls and 350 boys; $M_{age} = 5.7$, $SD = 0.32$) took part in the study. All children attended educational institutions in the Pomerania region of northern Poland. To analyze the specific relationships between parents and children in terms of involvement in PA, only mother–father–child triads were invited to participate in the study. The researchers chose this age because children's motor skills undergo significant changes at this stage of development (41). Before the age of 5, children acquire fluid body movements and balance, and learn to alternate their movements. Subsequently, with each passing year, the child's movements become more automatic and undergo improvement; in the early school period, motor development has reached a sufficient level to constitute the foundation for learning other activities (42). In addition, starting school in the "zero" grade is associated with the child's first partially independent decisions to engage in health-promoting or health-threatening behaviors. The ages of 5–6 years therefore constitutes an ideal period to investigate how parental attitudes and PA goals affect engagement in PA, or lack thereof, by children during their leisure time in middle childhood. Figure 2 presents descriptive statistics (mean values and standard deviation) on the results of the parenting attitudes presented by mothers and fathers.

Descriptive statistics on the goals of PA undertaken by mothers and fathers are presented in Figure 3.

Table 1 presents the mean, median, and standard deviation for parental attitudes and PA goals.

2.2. Procedure

Data were collected from participants recruited from preschools and primary schools in the Pomeranian region of Poland. The research was conducted in 2017–2019. Children were assessed individually at educational centers; the data used for this study were part of a larger project, and the detailed recruitment procedure is described elsewhere (43). Prior to the study, written informed consent was obtained from all parents/carers, who were also informed that they could discontinue the participation of their children at any time without repercussions.

This study was conducted in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving collection of data from humans. The protocol of this study was approved by the Ethics Board for Research Projects at the Institute of Psychology, University of Gdansk, Poland (decision no. 17/2013).

2.3. Research tools

We collected several different kinds of information using the Parental Attitudes Scale (SPR), the Inventory of Physical Activity Objectives (IPAO), and the Survey for the Assessment of Children's PA. The authors conducted interviews of the parents, which included questions about the type and amount of time spent by children and parents on PA outside their home and educational institution. The data used for this study were part of a larger survey, and the questionnaires that formed this study took approximately 20 min to complete.

2.3.1. The parental attitudes scale (SPR)

The questionnaire consists of 50 diagnostic statements grouped into five dimensions corresponding to the five different parental attitudes: acceptance–rejection, autonomy, overprotective, overly demanding, and inconsistent. The "acceptance–rejection" category describes the level of parental acceptance of the child, where low scores indicate distant, insensitive, and rejecting attitudes (psychologically and physically) toward the child, and high scores point to accepting, supportive, and sensitive parental attitudes. The "autonomy" category measures the level of parental respect for the child's needs and the parent's ability to adjust their behavior to the child's developmental needs (the higher the score, the higher the acceptance of the child's autonomy). The "overprotective" category measures the tendency to consider one's own child vulnerable, helpless, and dependent; the higher the score on this dimension, the higher the intensity of a distrustful attitude and preoccupation with the child's future. The "demanding" category focuses on parental expectations of the child; high scores in this category are associated with more rigid and critical attitudes toward the child and valuing of submissive behavior. Finally, the "inconsistent" dimension measures parental inclination toward

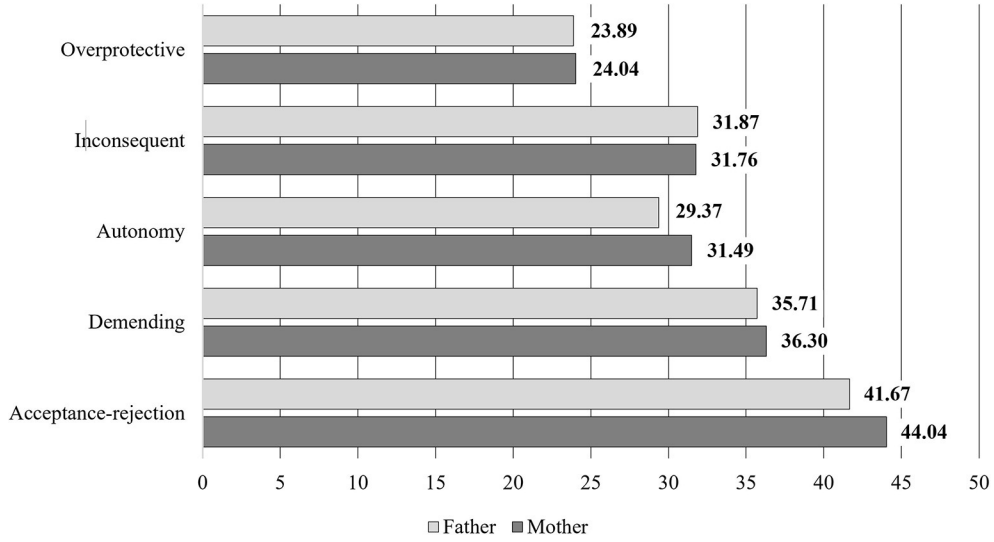

FIGURE 2
Descriptive statistics on parental values and attitudes.

inconsistent reactions dependent on their mood and daily situation, and general parental emotional instability (36).

The respondents were asked to rate on a five-item scale how strongly they agreed or disagreed with statements corresponding to each of these five dimensions of parental attitudes. The questionnaire was administered using two different versions to examine maternal and paternal attitudes. The Cronbach's alpha reliability coefficients for our sample were 0.85 for mothers and 0.86 for fathers.

2.3.2. The inventory of PA objectives

The Inventory of PA Objectives (IPAO) by Lipowski and Zaleski (44) was used to collect detailed interviews regarding the athletic history of the parents and their current engagement in various forms of PA. The questionnaire contains questions regarding whether the respondent has participated in sports in the past, what kind of sports they practiced, for how long, and at what level. Analysis of the number of hours per month currently devoted to certain types of PA (e.g., gym, swimming, running, team sports, martial arts) is an important part of the questionnaire; additionally, respondents indicated whether they engaged in these activities regularly or sporadically. The questionnaire also allows for the analysis of the goals with which respondents undertake PA (44). However, this aspect was not used in the current study. The Cronbach's reliability coefficient for the IPAO was 0.79.

2.3.3. The survey for the assessment of children's PA

The Survey for the Assessment of Children's PA was developed by (43) for the current project. Parents answered questions indicating the number of hours per week that their child devoted to outdoor play, participation in organized sports classes, walks with parents, riding a bicycle, and playing at playgrounds. Parents were also asked to list additional school classes (outside school/preschool) in which their child participated and to provide an assessment the number of hours per week their child devoted to these classes. The survey also contains questions regarding the types of sports equipment owned by the child. Finally, parents were asked to assess their children's physical fitness on a scale from 1 ("my child has very low levels of physical fitness") to 5 ("my child has very high levels of physical fitness").

3. Results and statistical analysis

In the course of further analysis, a number of statistical calculations were conducted (analysis of the normality of the distribution and correlations between the variables) to assess the suitability of the data for verification of the proposed model. As the data were suitable, the model was tested in relation to the raw data collected. The variables were standardized, and a path model was subsequently developed based on the theoretical model presented above (Figure 1). The AMOS 21 software tool, which is part of the SPSS program, was used to conduct this analysis.

Due to the large number of interactions tested, we report only the final outcomes of the path analysis in this article, presenting only significant path coefficients. Proxy variables and independent variables were introduced gradually to achieve the best possible adaptation of the path model to the raw data.

The data were statistically analyzed using the Statistica program, and path models were constructed for parent–child dyads using AMOSS SPSS v.18. The path models obtained for mother–child and father–child dyads are presented in Tables 1, 2, respectively. Under the theoretical models for both father–child and mother–child dyads, it was assumed that, beyond the parent's PA goals, the number of hours spent per month on PA by the parent

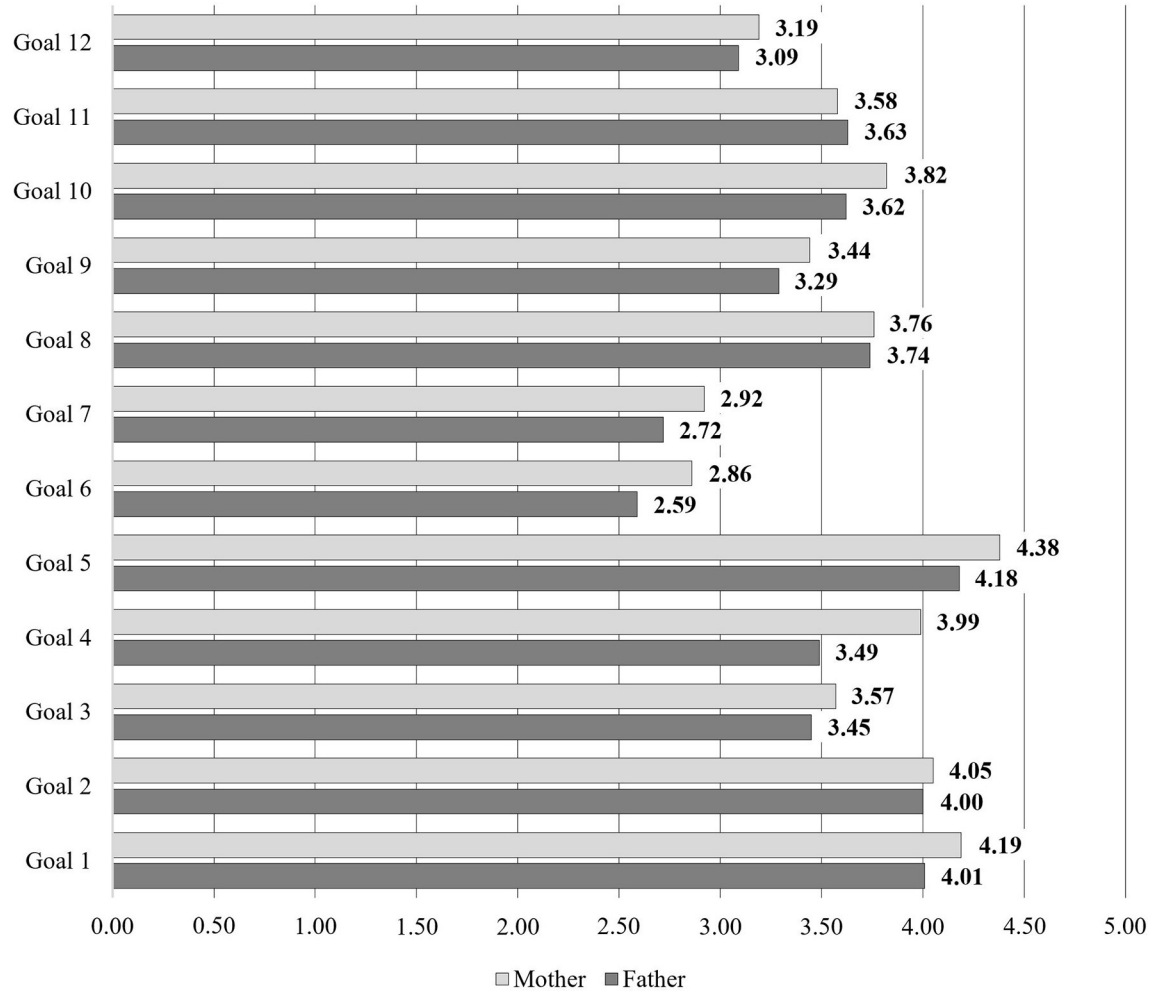

FIGURE 3
Descriptive statistics on the values and goals underlying parents' engagement in PA. Goal 1: health (right levels of: blood pressure, cholesterol, body mass, etc.); Goal 2: physical fitness, being "in shape"; Goal 3: company of other people; Goal 4: fit, shapely body (beauty, sculpted and firm body); Goal 5: well-being; Goal 6: being physically active and fit according to fashion; Goal 7: boosting confidence, gaining appreciation from others; Goal 8: pleasure from physical activity; Goal 9: escape from everyday life; Goal 10: managing stress; Goal 11: fulfilling the need for activity; Goal 12: promoting physical activity by setting a behavior example.

would also be of some importance. However, the number of hours spent per month on PA by the mother or father had no statistically significant impact on the amount of the child's leisure time spent engaging or not engaging in PA, and no correlation was found between parental attitudes and PA goals.

3.1. Path mediation model for the mother–child dyad

The path model analysis for mothers showed that only parental attitude of autonomy and demanding parental attitude influenced mothers' assessments of their child's fitness and their non-PA leisure time. Parental attitudes had a significant impact on the mother's PA goals. Finally, the mother's PA goals had a direct impact on the child's leisure time spent engaging in PA and their fitness (Table 2).

3.1.1. Attitude of autonomy

A strong attitude of autonomy toward one's child (being accepting and allowing freedom in decision-making) contributed to the mother's PA goal of spending time in other people's company and to her willingness to be physically active. Additionally, it can be observed that a strong attitude of autonomy increased the strength of the PA goals of boosting confidence and finding escape from everyday life. The mother's attitude of autonomy was statistically significant ($p < 0.001$) in its relationship with the aforementioned goals.

3.1.2. Acceptance–rejection attitude

The greater the extent to which mothers showed acceptance toward their children, the less they needed to achieve the goal of boosting confidence. This relationship was statistically

TABLE 1 Mean, median, and standard deviation for each variable relating to parental attitudes and PA goals.

Mothers	*M*	*Me*	Min	Max	*SD*
SPR: acceptance–rejection	44.04	45.00	15.00	50.00	4.96
SPR: overly demanding	36.30	36.00	22.00	50.00	4.48
SPR: autonomy	31.49	31.00	12.00	50.00	7.50
SPR: inconsistent	31.76	32.00	13.00	48.00	6.40
SPR: overprotective	24.04	24.00	10.00	44.00	6.97
Goal 1: health (right levels of: blood pressure, cholesterol, body mass, etc.)	4.19	4.00	1.00	5.00	0.92
Goal 2: physical fitness, being "in shape"	4.05	4.00	1.00	5.00	0.88
Goal 3: company of other people	3.57	4.00	1.00	5.00	1.15
Goal 4: fit, shapely body (beauty, sculpted and firm body)	3.99	4.00	0.00	5.00	0.95
Goal 5: well-being	4.38	5.00	1.00	5.00	0.80
Goal 6: being physically active and fit according to fashion	2.86	3.00	0.00	5.00	1.23
Goal 7: boosting confidence, gaining appreciation from others	2.92	3.00	1.00	5.00	1.21
Goal 8: pleasure from physical activity	3.76	4.00	1.00	5.00	1.01
Goal 9: escape from everyday life	3.44	4.00	1.00	5.00	1.12
Goal 10: managing stress	3.82	4.00	1.00	6.00	1.07
Goal 11: fulfilling the need for activity	3.58	4.00	1.00	5.00	1.06
Goal 12: promoting physical activity by setting a behavior example	3.19	3.00	0.00	5.00	1.17
Fathers					
SPR: acceptance–rejection	41.67	42.00	16.00	50.00	6.20
SPR: overly demanding	35.71	36.00	19.00	49.00	4.77
SPR: autonomy	29.37	30.00	10.00	50.00	7.76
SPR: inconsistent	31.87	33.00	13.00	49.00	6.97
SPR: overprotective	23.89	24.00	10.00	44.00	7.85
Goal 1: health (right levels of: blood pressure, cholesterol, body mass, etc.)	4.01	4.00	1.00	5.00	1.02
Goal 2: physical fitness, being "in shape"	4.00	4.00	1.00	5.00	0.96
Goal 3: company of other people	3.45	4.00	1.00	5.00	1.15
Goal 4: fit, shapely body (beauty, sculpted and firm body)	3.49	4.00	0.00	5.00	1.09
Goal 5: well-being	4.18	4.00	1.00	5.00	0.88
Goal 6: being physically active and fit according to fashion	2.59	3.00	0.00	5.00	1.20
Goal 7: boosting confidence, gaining appreciation from others	2.72	3.00	1.00	5.00	1.20
Goal 8: pleasure from physical activity	3.74	4.00	0.00	5.00	1.10
Goal 9: escape from everyday life	3.29	3.00	0.00	5.00	1.19
Goal 10: managing stress	3.62	4.00	0.00	5.00	1.12
Goal 11: fulfilling the need for activity	3.63	4.00	0.00	5.00	1.08
Goal 12: promoting physical activity by setting a behavior example	3.09	3.00	0.00	5.00	1.21

M, mean; Me, median; Min, minimum; Max, maximum; SD, standard deviation; SPR, Parental Attitudes Scale.

significant ($p < 0.001$). Additionally, it can be observed that a high degree of acceptance of the child was linked to the goal of well-being ($p < 0.01$). The strength of the goals of achieving a shapely body and managing stress increased with the mother's attitude of autonomy toward their child ($p < 0.05$).

3.1.3. Demanding attitude

A demanding attitude in the mother increased the strength of the goals of seeking pleasure from PA and fulfilling the need for exercise ($p < 0.001$). An excessively demanding attitude was linked to the strength of the goals of escaping from everyday life, managing stress relief, and promoting PA by setting an example ($p < 0.01$).

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TABLE 2 The obtained path model for the mother–child dyad.

Path model: MOTHER			Path factor	*p*
Goal 4: fit, shapely body	<–	SPR_M_acceptance–rejection	0.120	*
Goal 5: well-being	<–	SPR_M_ acceptance–rejection	0.162	**
Goal 6: being active	<–	SPR_M_ acceptance–rejection	−0.127	*
Goal 7: confidence and appreciation	<–	SPR_M_ acceptance–rejection	−0.297	***
Goal 10: managing stress	<–	SPR_M_ acceptance–rejection	0.138	*
Goal 3: company of other people	<–	SPR_M_ autonomy	0.260	***
Goal 6: being active	<–	SPR_M_ autonomy	0.259	***
Goal 7: confidence and appreciation	<–	SPR_M_ autonomy	0.347	***
Goal 9: escape from everyday life	<–	SPR_M_ autonomy	0.206	***
PA leisure time without the child	<–	SPR_M_ autonomy	0.171	**
Goal 3: company of other people	<–	SPR_M_inconsistent	−0.124	*
Goal 4: fit, shapely body	<–	SPR_M_ inconsistent	−0.174	**
Goal 3: company of other people	<–	SPR_M_overprotective	−0.157	**
Goal 7: confidence and appreciation	<–	SPR_M_overprotective	−0.142	*
Goal 10: managing stress	<–	SPR_M_ overprotective	0.123	*
Goal 8: pleasure from PA	<–	SPR_M_over-demanding	0.183	***
Goal 9: escape from everyday life	<–	SPR_M_ over-demanding.	0.129	**
Goal 10: managing stress	<–	SPR_M_ over-demanding	0.125	**
Goal 11: fulfilling the need for activity	<–	SPR_M_ over-demanding	0.173	***
Goal 12: promoting PA	<–	SPR_M_ over-demanding	0.136	**
Efficiency assessment	<–	SPR_M_ over-demanding	0.179	***
Assessment of child's fitness	<–	Goal 3: company of other people	0.091	*
Child's PA leisure time	<–	Goal 4: fit, shapely body	−0.084	*
PA leisure time without the child	<–	Goal 4: fit, shapely body	−0.112	**
PA leisure time without the child	<–	Goal 6: being active	0.101	*
Child's PA leisure time	<–	Goal 12: promoting PA	0.088	*
Assessment of child's fitness	<–	SPR_M_ over-demanding	0.179	***
PA leisure time without the child	<–	SPR_M_autonomy	0.171	**
Assessment of child's fitness	<–	Goal 3: company of other people	0.091	*
Child's PA leisure time	<–	Goal 4: fit, shapely body	−0.084	*
PA leisure time without the child	<–	Goal 4: fit, shapely body	−0.112	**
PA leisure time without the child	<–	Goal 6: being active	0.101	*
Child's PA leisure time	<–	Goal 12: promoting PA	0.088	*

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
Indicators of fit: chi-squared test = 3.59, df = 1, $p > 0.05$; CFI = 0.999; RMSEA = 0.037.

3.1.4. Protective attitude

A protective attitude in the mother reduced the strength of the goal of spending time in other people's company ($p < 0.01$). Additionally, higher levels of protectiveness were linked with lower strength of the goals of boosting confidence and managing stress ($p < 0.05$).

3.1.5. Inconsistent attitude

A more inconsistent attitude was linked with higher strength of the goal of spending time in other people's company and an increased need for a fit, shapely body. The influence of an inconsistent attitude was the least statistically significant ($p < 0.05$).

3.1.6. The influence of PA goals and parental attitudes on children's leisure activities in middle childhood

Mothers' attitudes of autonomy toward their children was linked with more non-PA leisure time among children ($p < 0.01$). However, a demanding attitude was important in mothers' assessments of their children's physical fitness: the more demanding the mother's attitude, the higher her assessment of the child's fitness ($p < 0.001$). A mother's PA goals had a greater influence on the child's engagement in PA, or lack thereof. The time spent by the child on non-PA activities outside preschool and the child's leisure time spent on PA both decreased as the strength of the mother's desire for a shapely body increased. The strength of the goal of being active increased the amount of leisure time spent on non-PA activities ($p < 0.05$). Finally, the strength of the goal of promoting PA by setting an example increased the child's PA time outside preschool ($p < 0.05$). Overall, parental attitudes had little effect on the dependent variables (Figure 4).

3.2. Path mediation model for the father–child dyad

The path model analysis for the father–child dyad showed that only the degree of inconsistent attitude in the fathers influenced the child's non-PA leisure time. Additionally, the strength of inconsistent attitude influenced the father's assessment of the child's fitness. Fathers' parental attitudes had little influence on the child's PA and non-PA leisure time. However, fathers' parental attitudes were linked to their own PA goals, and these goals had a direct impact on their assessment of the child's fitness and on the child's PA and non-PA leisure time (Table 3).

3.2.1. Attitude of autonomy

The stronger a father's attitude of autonomy toward their child, the greater the strength of his goals to spend time in other people's company during PA ($p < 0.001$) and to be active. Additionally, the stronger the father's attitude of autonomy, the greater the strength of his goal of boosting confidence ($p < 0.001$).

3.2.2. Acceptance–rejection attitude

The stronger a father's attitude of acceptance, the greater the strength of his goals of fulfilling the need for exercise, well-being, and pleasure ($p < 0.001$). Acceptance also increased with the strength of the goal of promoting PA by setting an example ($p < 0.01$). Lower levels of acceptance toward the child increased the fathers' stress relief through participation in PA ($p < 0.05$).

3.2.3. Inconsistent attitude

A low level of inconsistent attitude increased the child's amount of PA leisure time and influenced the strength of the father's goal of achieving a fit, shapely body ($p < 0.05$). Additionally, the lower the father's level of inconsistency, the lower his assessment of the child's fitness ($p < 0.05$).

3.2.4. Demanding and protective attitudes

The less demanding a father's attitude, the less emphasis he placed on the goal of being physically active ($p < 0.05$). A more protective attitude led to a decrease in the strength of the goal of promoting well-being ($p < 0.01$).

3.2.5. The influence of PA goals and parental attitudes on children's leisure activities in middle childhood

Fathers' attitudes had little effect on the dependent variables. Only the strength of inconsistency in attitude influenced the child's PA leisure time and the father's assessment of the child's fitness. Fathers' PA goals were of greater importance in their children's leisure time. The lower the father's desire to achieve a fit, shapely body, the less of the child's leisure time was devoted to PA ($p < 0.05$). The greater the father's desire for a fit, shapely body, the lower his assessment of the child's fitness ($p < 0.01$). The goal of well-being was linked to increased leisure time spent engaging in PA ($p < 0.05$). A strong need for PA in fathers was linked to less non-PA leisure time ($p < 0.01$). Finally, the strength of fathers' pleasure from PA was also linked to less PA leisure time (Figure 5).

3.3. Comparison of the obtained mother–child and father–child dyad models

In fathers, only four types of attitudes had an impact on PA goals: acceptance–rejection, inconsistency, autonomy, and overprotectiveness. Mothers' goals were influenced by a larger number of attitudes, acceptance–rejection, autonomy, inconsistency, over-demandingness, and overprotectiveness. Similarly, mothers' and fathers' attitudes of acceptance–rejection, autonomy, and overprotectiveness had an impact on their own PA goals, but were not directly linked to their children's PA leisure time. The similarity of the attitudes exhibited may be related to parents' shared beliefs regarding the upbringing of their children. In addition, these attitudes may be related to the child's physical and mental development via their influence on the parents' PA goals. In the future, this research model should be expanded to include other variables in order to define more precisely how parental attitudes affect PA in children in middle childhood. The models showed that the goal of achieving a fit, shapely body is important for parents of both sexes and affects the amount of leisure time the child spends on PA and non-PA activities. For fathers, other goals identified as influencing the child's PA were pleasure, satisfying the need for activity, and well-being, while in the case of the mother, it was important to be physically active and to promote PA by setting an example. The parents' assessment of the child's fitness depended on the degree of demandingness of the father's attitude and the strength of the goal of spending time in the company of other people. For fathers, the assessment of the child's fitness depended on the degree of inconsistency of his attitude and his desire to achieve a fit, shapely body.

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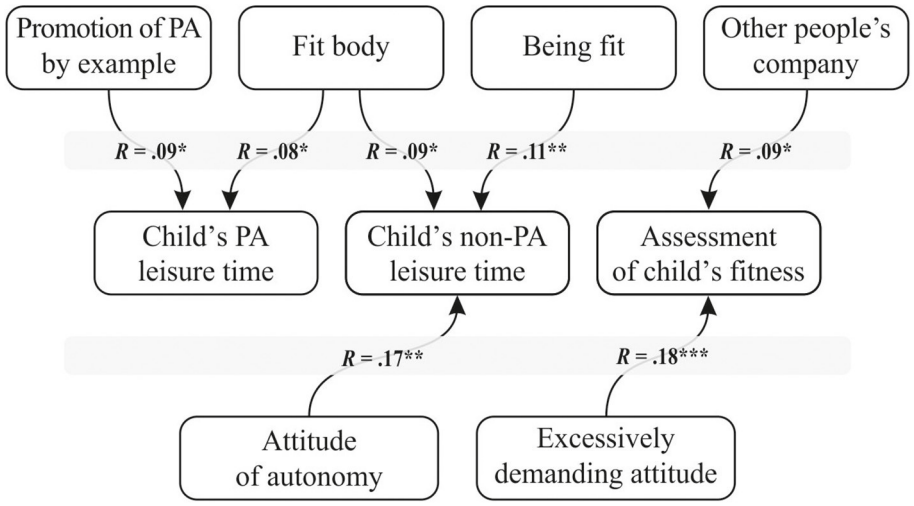

FIGURE 4
The obtained path model of the relationships between the mother's PA goals and parental attitudes and the child's engagement in PA. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

4. Discussion

In this study, neither the parental attitudes of the mother nor those of the father had a direct impact on the amount of leisure time that their children spent on PA. However, parents' attitudes were directly related to the mothers' and fathers' goals for PA, and these PA goals did have a direct impact on their children's PA leisure time. In fathers, only four types of attitude had an impact on their PA-related goals: acceptance–rejection, inconsistency, autonomy, and overprotectiveness. A larger number of attitudes were relevant among mothers: acceptance–rejection, autonomy, inconsistency, over-demandingness, and overprotectiveness. The child's gender was not a significant differentiating factor, and both parents displayed similar parental attitudes toward their children in relation to PA goals. Lipowska et al. (39) also concluded that the child's gender was not significant in relation to the nature of parental attitudes, but observed that it did matter in the context of sexism. The study by Lipowska et al. (39) on sexism in relation to parental attitudes showed that the mothers with the highest levels of sexism were characterized by inconsistent and demanding attitudes. Overprotectiveness and attitudes of autonomy were ranked the lowest in terms of their relationship with sexism. Mothers exhibit higher levels of acceptance–rejection, demanding attitudes, and attitudes of autonomy than do fathers. Education levels also played a role in this study: a higher level of education in the mother was linked to high levels of demandingness and low levels of autonomy.

Fathers with vocational education exhibited stronger attitudes of autonomy toward their offspring. With regard to the parents of preschoolers surveyed previously, the role of sexism appeared to be most notable in the attitudes of mothers toward their sons (39). In the authors' own research, the most important attitudes identified in mothers were acceptance–rejection, overprotectiveness, demandingness, and attitudes of autonomy. The attitudes of autonomy and acceptance–rejection were also significant in fathers. Similar conclusions were obtained here is in previous studies on sexism by Lipowska et al. (39). In both studies, significant relationships were identified with mothers' attitudes of autonomy, demandingness, and overprotectiveness.

Lipowski et al. (17) examined two groups of parents: former and current athletes. Among the families surveyed, 152 mothers were former athletes, and only 61% of them continued to play sports regularly; 198 fathers were former athletes, of whom 171 (86%) continued to play sports regularly. Although Lipowski et al. (17) did not directly report on parental attitudes, they touched on an important aspect of PA in the family in relation to parents' feeding styles. The authors observed significant differences between the mothers who currently practiced sports and those who did not practice sports regularly: mothers who engaged in sporting activities (either organized or on their own) used a controlling and encouraging parenting style more often and displayed a lesser tendency toward the emotional feeding style compared to women who did not exercise. In addition, their children spent more hours per week on sports. A similar pattern was observed in the comparison between fathers who were regularly exercising and those who were not doing so. Less frequent use of control and incentive-based parenting styles was observed in families in which neither the mother nor the father practiced sports regularly. In families where both parents regularly engaged in sporting activities, parents more frequently engaged in an emotional style of eating compared to families where only one parent practiced sports or neither of the parents did (17). Comparing the results obtained by Lipowski et al. (17) with the results of this study, it can be observed that PA among mothers and fathers affects both their eating styles and their parental attitudes. Less involvement in sports results in a lower degree of control in eating styles among both mothers and fathers. A similar relationship was observed in the present study between the goals of PA undertaken by parents and their parental attitudes. The more acceptance shown by a mother toward her

TABLE 3 The obtained path model for the father–child dyad.

Path model: FATHER			Path factor	*p*
Goal 5: well-being	<–	SPR_O_ acceptance–rejection	0.229	***
Goal 8: pleasure from PA	<–	SPR_O_ acceptance–rejection	0.259	***
Goal 10: managing stress	<–	SPR_O_ acceptance–rejection	0.154	*
Goal 11: fulfilling the need for activity	<–	SPR_O_ acceptance–rejection	0.241	***
Goal 12: promoting PA	<–	SPR_O_ acceptance–rejection	0.179	**
Goal 3: company of other people	<–	SPR_O_autonomy	0.212	***
Goal 6: being active	<–	SPR_O_autonomy	0.194	**
Goal 7: confidence and appreciation	<–	SPR_O_autonomy	0.212	***
Goal 4: fit, shapely body	<–	SPR_O_ inconsistent	0.131	*
PA leisure time without the child	<–	SPR_O_ inconsistent	0.149	*
Assessment of child's fitness	<–	SPR_O_ inconsistent	−0.142	*
Goal 5: well-being	<–	SPR_O_ overprotective	−0.181	**
Goal 6: being active	<–	SPR_O_ overprotective	−0.129	*
Child's PA leisure time	<–	Goal 4: fit, shapely body	−0.090	*
PA leisure time without the child	<–	Goal 4: fit, shapely body	−0.091	*
Assessment of child's fitness	<–	Goal 4: fit, shapely body	−0.113	**
Child's PA leisure time	<–	Goal 5: well-being	0.096	*
Child's PA leisure time	<–	Goal 8: pleasure from PA	−0.117	**
PA leisure time without the child	<–	Goal 11: fulfilling the need for activity	−0.149	**
PA leisure time without the child	<–	SPR_O_ inconsistent	0.149	*
Assessment of child's fitness	<–	SPR_O_ inconsistent	−0.142	*
Child's PA leisure time	<–	Goal 4: fit, shapely body	−0.090	*
PA leisure time without the child	<–	Goal 4: fit, shapely body	−0.091	*
Assessment of child's fitness	<–	Goal 4: fit, shapely body	−0.113	**
Child's PA leisure time	<–	Goal 5: well-being	0.096	*
Child's PA leisure time	<–	Goal 8: pleasure from PA	−0.117	**
PA leisure time without the child	<–	Goal 11: fulfilling the need for activity	−0.149	**

*$p < 0.05$; **$p < 0.01$; **$p < 0.001$.
Indicators of fit: chi-squared test = 1.19, df = 1, $p > 0.05$; CFI = 0.999; RMSEA = 0.012.

child, the lower the strength of her need to achieve the goal of boosting confidence.

Additionally, a strong attitude of acceptance toward the child was found to increase the strength of the goal of well-being. Stronger goals of attaining a shapely body and managing stress increased mothers' attitudes of autonomy toward their offspring. It can be concluded that mothers who are less controlling with respect to their own goals are more accepting of autonomy in their offspring. For fathers, a stronger goal of boosting confidence was linked to greater autonomy toward the child. It can also be concluded that such fathers may have less need to control their offspring's engagement in PA during their leisure time.

Parental attitudes are rarely analyzed in the context of children's involvement in PA. Cheung (45) examined the attitude of parents toward out-of-school PA among children attending school (early school education). The parents agreed that the children did not get enough PA outside school, mentioning the sheer volume of activities that occur outside school, such as doing homework and watching TV. Cheung confirmed that parents do not always facilitate PA during leisure time, but argued that this is crucial for their children (45).

In their own research, the authors have found that parental attitudes are, to a small extent, responsible for children's participation in PA, or lack thereof, in their leisure time during middle childhood. Their own PA goals also play a major role. Tandon et al. (25) confirmed that parents and caregivers believe that daily PA is essential for preschoolers, but caregivers of children rate the importance of spending time outdoors during the day much more highly than do parents.

Leung et al. (46) examined parents and children aged 6–9 years in the context of support provided for PA (measured by the Parent

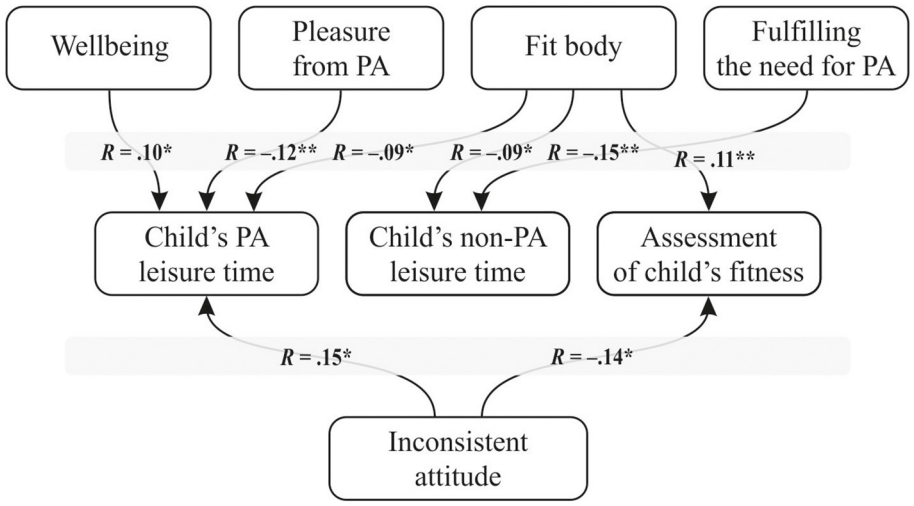

FIGURE 5
The obtained path model of the relationships between the father's PA goals and parental attitudes and the child's engagement in PA. $^{*}p < 0.05$; $^{**}p < 0.01$.

Support Scale) and found that parental support had a direct impact on children's PA.

In the authors' own research, attitudes of autonomy among fathers and mothers were found to influence their PA goals. A mother's attitude of autonomy toward her offspring influenced the child's non-PA leisure time, and the strength of a mother's demanding attitude influenced her assessment of the child's fitness. In fathers, the strength of inconsistency in attitude influenced his assessment of the child's fitness and the child's non-PA leisure time. Supporting and encouraging children to engage in PA is important to parents, and together with attitudes and parenting styles, this support and encouragement can affect children's engagement in PA during their leisure time in middle childhood.

Our own research and that of Leung et al. (46), Cheung (45), and Tandon et al. (25) has demonstrated that parents have a significant influence on PA among their children in the period of middle childhood and the early school years. Alpgan et al. (42) investigated parental attitudes and the opinions of parents regarding the readiness of children (5–6 years). They reported that Metropolitan Readiness Test (MRT) scores are significantly negatively correlated with scores on the subscales of the Parental Attitude Research Instrument (PARI) measuring overprotectiveness, refusal to be a housewife, husband–wife conflict, and strict discipline. Specifically, as children's MRT scores increase, there is a decline in parental overprotectiveness, refusal to be a housewife, husband–wife conflict, and strict discipline. The mean scores for refusal to be a housewife, husband–wife conflict, and strict discipline were higher for parents of children who were not ready for school than for those who were ready for school. Negative attitudes within the family reduce children's readiness for school (47).

Similar conclusions can be drawn from our own research: inconsistent attitudes in fathers reduced their assessment of their children's fitness and were linked to increased non-PA leisure time. However, mothers' attitudes of autonomy were also associated with an increase in children's non-PA leisure time. An excessively demanding attitude contributed to a better assessment of the child's fitness by the mother. Parents' attitudes toward their own children exert indirect effects on both readiness to start learning and engagement in PA. Lindsay et al. (48) identified health-related parenting practices related to PA, which included PA modeling, engaging in PA with the child, and encouraging the child to engage in PA. Mothers emphasized the importance of parents as role models and exerted a positive effect on children's PA. In addition, the authors identified parenting practices that limit children's PA (48).

Our research shows that parental attitudes depend on parents' PA-related goals, and it is these goals that in turn affect the engagement of children in PA during their leisure time. Comparing this research to that of Lindsay et al. (48) confirms that parents' behaviors and practices influence how their preschool-aged children spend their time. The abovementioned studies were qualitative in nature and were conducted in a similar age group. However, this research was transverse in design and used standardized questionnaires and scales to assess the goals of PA and parental attitudes. In the future, this study may form the basis for the initiation of longitudinal studies and the observation of children not only at preschool age but also at school age. This area of research may offer the possibility for transgenerational observation of children and their families from the point of view of PA within the family.

5. Limitations

The study was cross-sectional and observational in nature. The study employed not only questionnaires and scales to objectively assess parents' attitudes toward their offspring but also parents' subjective assessments of their children's PA. Parents provided information about their offspring's PA, which might have resulted

in less objective assessments of their children, but the authors used a 5-point scale to reduce parental subjectivity in assessing their child's PA.

No randomization or blinding of the study group was used in this study; this was due to the lack of a control group. The aim of the study was not to compare parental attitudes toward children across different age groups. Instead, the authors collected data on a large group of parent–child dyads to investigate the relationships between parental attitudes, parental PA-related goals, and children's PA during their leisure time. The lack of longitudinal analysis was also related to the deliberate selection of the age group of the children; no attention was paid to the observation of changes in parental attitudes toward their offspring over a specific time frame. However, it would be worthwhile to carry out a longitudinal study in the future and compare the parental attitudes of children in middle and late childhood, investigating how these attitudes affect PA during leisure time. Longitudinal surveys require that participants be sufficiently motivated to complete the survey procedure. The transverse nature of the present study was associated with the desire to test a large group of parent–child dyads and obtain the most accurate results subject to statistical analysis.

6. Conclusion

The results indicated that not all parental attitudes had a direct impact on children's PA and non-PA leisure time. A mother's attitude of autonomy toward her children had a direct impact, reducing children's non-PA leisure time. Among fathers, it transpired that an inconsistent attitude was significant is increasing the child's non-PA leisure time. Other aspects of parental attitude did not have a significant effect on children's leisure time. However, the goals of parents' PA were found to influence children's PA and non-PA leisure time. In mothers, goals such as being active, being fit, and promoting PA, for example, had a direct impact on whether their children were active or not during their leisure time. Fathers' PA goals also directly influenced the quality of their offspring's leisure time. The parental PA-related goal that most strongly influenced PA and non-PA leisure time among their children was the desire for a fit, shapely body. The goals of fathers differed from those of mothers in this study. The most statistically significant relationships for both mothers and fathers were between parental attitudes and PA goals. The results of this study suggest that parental attitudes do not play a significant role in explaining engagement in PA, or lack thereof, during leisure time among 5-year-old children.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Board for Research Projects at the Institute of Psychology, University of Gdansk, Poland (Decision No. 17/2013). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

Conceptualization, methodology, investigation, data curation, supervision, and funding acquisition: MLipowska and MLipowski. Software: MLipowski and SL. Writing—original draft: AK, MLipowska, and SL. Writing—review and editing: AK, MLipowska, and SL. Project administration: MLipowska. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring

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The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring

Abstract

Introduction: Observing parents' body-focused behaviours during middle childhood is one of the initial ways in which children model their perceptions of pro-health attitudes and their connection to physical attractiveness. This study aimed to investigate the relationship between parents' health behaviours, their appearance, and the perceptions of adult body types (skinny, medium, obese) by their five-year-old children. Moreover, the role of gender in the above relationship for both children and parents was also examined. Materials and methods: This study participants were 680 families with five-year-old children (330 girls). Participation was limited to the moth-er-father-child triad. The Beauty and Health Scale, Healthy Behaviour Inventory, Inventory of Physical Activity Objectives, and a body composition analyser were used to measure body fat percentage. Results: Assessment of pictures of male silhouettes by five-year-old girls revealed the perception that men who exercise do not lose weight but maintain a healthy, attractive appearance. However, they believed that women should actively lose weight to achieve an attractive figure. Interestingly, women were more likely to be perceived as overweight, despite engaging in physical activity. Conclusions: This study underscores the importance of integrating health education and physical activity interventions into family-oriented disease prevention programmes aimed at cultivating positive health behaviours in children as well as parents.

Keywords

physical activity in family, health habits and physical activity, body image and child's perception, body image in family system, physical activity and body perception

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Article

The transgenerational transmission of physical attractiveness perceptions: Role of parents' physical activity and nutrition habits in modelling body-focused health attitudes and body shape perception in five-year-old offspring

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Abstract: Introduction: Observing parents' body-focused behaviours during middle childhood is one of the initial ways in which children model their perceptions of pro-health attitudes and their connection to physical attractiveness. This study aimed to investigate the relationship between parents' health behaviours, their appearance, and the perceptions of adult body types (skinny, medium, obese) by their five-year-old children. Moreover, the role of gender in the above relationship for both children and parents was also examined. Materials and methods: This study participants were 680 families with five-year-old children (330 girls). Participation was limited to the moth-er-father-child triad. The Beauty and Health Scale, Healthy Behaviour Inventory, Inventory of Physical Activity Objectives, and a body composition analyser were used to measure body fat percentage. Results: Assessment of pictures of male silhouettes by five-year-old girls revealed the perception that men who exercise do not lose weight but maintain a healthy, attractive appearance. However, they believed that women should actively lose weight to achieve an attractive figure. Interestingly, women were more likely to be perceived as overweight, despite engaging in physical activity. Conclusions: This study underscores the importance of integrating health education and physical activity interventions into family-oriented disease prevention programmes aimed at cultivating positive health behaviours in children as well as parents.

Keywords: physical activity in family, health habits and physical activity, body image and child's perception, body image in family system, physical activity and body perception.

1. Introduction

In children, "Body Self" is the first component of the 'self' that develops over the course of ontogenesis [1]. One's relationship with their body begins to be defined in early childhood, initially as an outcome of parental influences. Nearly till the end of preschool, children have very little direct influence on parental body-related health behaviours. These are adults who are responsible for the nutrition and physical fitness of their off-

spring [2, 3]. Parents shape how their children perceive physical attractiveness, both indirectly and directly, and also teach about its importance in social life [4]. Moreover, mothers and fathers are the first determinants of the canons of beauty [5], as they directly express their approval or disapproval regarding the appearance of other people, media celebrities, and even their own children.

1.1. Eating habits and body image

Children's perception of what constitutes beauty is shaped not only by parents' physical appearance and parents' opinions on beauty ideals but also by their body care behaviours. Parents clearly socialise their children, establishing norms about eating, weight, shape, and response to stress, and controlling the food environment in the home [6]. Mothers of post-infantile and preschool children show particular body weight concerns [7]. Children inadvertently observe their mothers' efforts to improve their own appearance either through health-promoting practices, such as balanced diets or physical activity, or through restrictive slimming practices, use of weight loss agents, and obsessive weight-watching [8]. Moreover, children often hear conversations among adults about physical attractiveness, its role in social life, and how to achieve it. Furthermore, they frequently witness their mothers complaining about their own appearance, especially body weight [9, 10]. Adolescent daughters often face a combination of critical remarks about their bodies and encouragement for weight loss and dieting from parents, and mothers' modelling of extreme crash dieting is associated with parallel behaviours in daughters [11]. Parents use more targeted modelling with same-sex children [7, 12]. Parents observe the eating behaviour of their offspring, highlighting differences in how mothers and fathers implement nutritional parenting practices and/or differences in how these practices affect their children [13, 14]. In addition, healthy weight management and nutrition education are important elements that contribute to the correct perception of body shape [15]. Emotional states influence perceptions of eating, especially in girls. High body dissatisfaction leads to vulnerability to emotional attitudes towards food [16]. Parental messages related to the body, including those encouraging weight change and healthy eating, contribute to children's body dissatisfaction. A family culture focusing on appearance has a greater impact on daughters than on sons, potentially leading to unhealthy attitudes towards food and inappropriate attitudes towards one's own appearance. In daughters, poor body image increases the risk of developing eating disorders [17].

1.2. Physical activity and body image

Regular physical activity (PA) and having a balanced nutritious diet are the most common health-promoting behaviours [18]. Both PA and diet directly impact the condition and health of the body, and indirectly impact mental health and general well-being [19]. Physical activity and diet are the main route to achieving an attractive physique [20, 21]. Interestingly, the intensity of involvement in PA itself boosts satisfaction with one's appearance, regardless of objective parameters such as body mass index (BMI) or waist-to-height ratio (WtHR) [22, 23]. The important moderating role of gender in this area is again emphasised. The unquestionable influence of sport activity on body shape, mostly through increasing muscle mass, is also congruent with the standards of appearance for men, but not women [24–26]. Women generally state that the goal of PA is to obtain or maintain a skinny figure and prevent obesity [27]. Moreover, sport is a perfect example of an area with very strong stereotypes—it is usually described as 'masculine' [28, 29]. In most cultures, boys engage in more sporty play activities than girls [30, 31]. They are also more motivated to practice sports [32] and partake in physical education classes [33]. The gender of both parents and children also plays an important role in the process of intergenerational transmission of beauty ideas connected with PA.

1.3. The role of gender in body perception

There are hardly any psychological processes that are more gendered than body image. Men and women differ in both content and degree of body dissatisfaction and body change behaviours. Currently, gender differences are clear and feasible: females focus on weight and body shape, while males are interested in muscular tone [34, 35]. However, the most important difference lies in the subjective significance of physical attractiveness as perceived by women and men [36]. Physical attractiveness is considered a crucial element of femininity, but not of masculinity [37]. Both women and men hold a 'single' ideal of feminine beauty (interpreted as 'the only way' to evaluate the attractiveness of the female body shape), while what represents an attractive body shape in males is not so clearly defined. Although the model of beauty is stable over time, a man can be 'attractive in a different way' [38]. This proves the prescriptive notion of standards for female beauty. The level of muscularity is associated with the efficiency and strength of the body and, therefore, is desirable; however, it is not connected with excessive value when assessing the image of a male body [36].

Women's increased attention on their bodies as objects of beauty is likely to be a key factor in explaining their more negative body esteem as compared to men [36]. Differences in attitudes toward their own bodies, observed among girls and boys, are particularly evident during adolescence, when body dissatisfaction increases among girls and decreases in boys [39]. Girls and young women most often report dissatisfaction with their body shape and insufficiently feminine appearance [40]. This can be linked to the biological changes that girls undergo during adolescence as well as the prevalence of unrealistic beauty standards that dictate what a desirable adult female body should look like [9, 41]. This weight gain puts girls at odds with Western culture's standard for female appearance, an extremely thin and pre-pubertal body shape, which is unhealthy and unattainable for most post-pubertal girls [42]. Gender differences emerge in childhood and seem to persist throughout most of life [43].

1.4. The present study

In this study, we examine the relationship between two variables. The independent variable is the parents' health behaviour (diet and PA) and their appearance, in terms of the fat level (body fat percentage). The dependent variable is children's attribution of health behaviours to the silhouettes presented in the drawings.

We formulated two research questions:

1) Is there a relationship between parents' health behaviours and appearance (passive modelling) and children's perception of adults' silhouettes?
2) Does the gender of both children and parents play a significant role in this relationship?

We developed a theoretical research model that describes the parent-child relationship, indicating selected assumptions of the relationship between the variables (Figure 1).

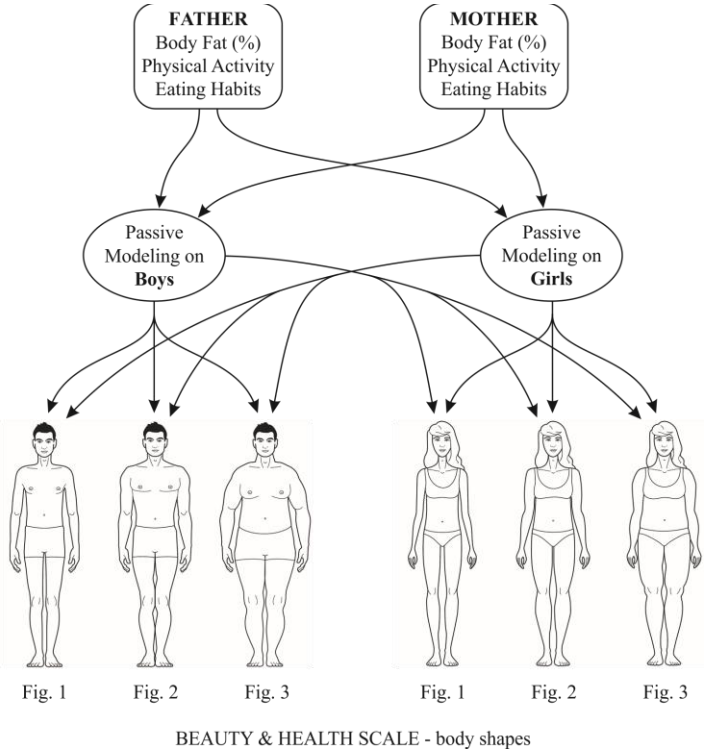

Figure 1. Theoretical model of the assumed dependencies in the parent-child relationship

2. Materials and methods

2.1. Participants

A total of 416 families with five-year-old children (190 girls and 226 boys; M = 5.70, SD = 0.32, *girls M= 6.2, boys M= 5.2, girls SD= 0.34, boys SD = 0.32*) participated in this study. Only mother-father-child triads were invited so as to enable analysis of the relationship between the passive modelling of parental health behaviour and its perception by the offspring. We chose five years as the age because children's motor skills grow significantly at that stage of development [44]. In addition, starting school in the 'zero' class is associated with the first, partially independent decision to engage in health-promoting or health-endangering behaviour. Age five is the ideal time to explore how health behaviours can passively model the child's perception of their parents' body shapes. To control the influence of family factors and the socioeconomic status (SES), several variables were collected: the parents' age (M_{male} = 34.00, SD_{male} = 5.24, M_{female} = 37.00, SD_{female} = 6.00), the area of residence (26.50% lived in villages, 9.75% in small towns, 23.25% in mid-size cities, 40.50 % in large cities), and the number of children in the family (21% one-child families).

2.2. Procedure

Data were collected from participants selected from kindergartens and primary schools in the Pomeranian Region in Poland. Children were assessed individually in educational centres; the data used in this study was part of a larger project, and the detailed enrolment procedure was described elsewhere. Prior to the study, written informed consent was obtained from all parents/guardians who were also assured that they may discontinue their children's participation at any time without consequences. The study procedure was performed in accordance with the World Medical Association's Code of Ethics (Declaration of Helsinki) for human experiments using data collection. The protocol of this study was approved by the Ethics Board for Research Projects at the Institute of Psychology, University of Gdansk, Poland (decision no. 17/2013). The preparation of this article was supported by the National Science Centre (grant number 2015/17/B/HS6/04144; head: Malgorzata Lipowska).

2.3. Methods

Different types of information were collected using the Beauty & Health Scale (BHS), the Inventory of Physical Activity Objectives (IPAO), Inventory of Healthy Behaviours (HBI), and the Body Composition Analyser. The data used for this study was part of a larger survey, and the study questionnaires took around 20 minutes to complete.

The Beauty and Health Scale (B&HS) [45] – in this scale, children were asked to match features related to pro-health or anti-health behaviours and social status to pictures of female and male silhouettes with distinctly different body weights. This scale is designed for children aged 5–9 and includes 18 items. Some of them are supported with illustrations presenting various behaviours. The child is asked to match each activity to one of three pictures presenting adults with different body shapes (skinny, normal, and obese). The questionnaire has two variants, for girls and boys, referring to women and men, respectively. In this study, we only used two subscales—pro-health behaviours and anti-health behaviours. Cronbach's α for individual subscales had satisfactory values between 0.86 and 0.89 [45].

The Inventory of Physical Activity Objectives (IPAO) by Lipowski and Zaleski [46] was used to collect detailed interviews regarding the parents' athletic past and their current engagement in various forms of PA. The questionnaire contains questions regarding whether one has done sport in the past and what discipline they practiced, for how long, and at what level. Analysis of the number of hours per month currently devoted to certain types of PA (e.g., gym, swimming, running, team sports, martial arts) is an important part of the questionnaire; additionally, respondents indicate whether they engage in these activities regularly or sporadically. The questionnaire also allows the analysis of the goals with which respondents undertake PA; however, this aspect was not used in the current study. Data on the total number of hours spent on maternal and parental PA during the month were analysed. The Cronbach's reliability coefficient for IPAO reached 0.79.

The Healthy Behaviour Inventory (HBI) [47] evaluates involvement in health-seeking practices. It presents 24 Likert-scaled statements describing various types of health-seeking behaviours divided into four subscales: proper nutrition habits, prophylactic behaviour, health practices, and positive psychological attitudes. The respondents reveal how frequently they engage in the described behaviour using a 5-point scale (1– almost never, 2 – rarely, 3 – from time to time, 4 – often, and 5 – almost always). In this study, we only used the proper nutrition habits subscale. Internal consistency was assessed using Cronbach's α, which was equal to 0.85 for the entire inventory and 0.60 for the proper nutrition habits.

The Body Composition Analyser (Segmental Body Composition Monitor–Tanita BC-601) helps assess the body-fat status of children and parents. For the statistical analysis, the parameter of maternal and paternal fat as body fat percentage (%BF) were taken into account.

3. Results

3.1. Descriptive statistics of the study group

In the first stage of statistical analysis of the obtained research results (using the STATISTICA 13.3 program), in accordance with the research questions, descriptive statistics were used in the following ways.

1) Description of socio-demographic indicators that are significantly related to the characteristics of the study group (age, gender, mother's and father's education) were obtained (Table 1).
2) Descriptive statistics were calculated for the variables used in the research model. For this purpose, various values, such as the average and median values, were measured for the following variable indicators: PA of the mother and father and body fat percentages of the mother and father (Table 2).

3) The percentage distribution of variables was made: the level of PA of the mother and father and the level of body fat percentage of the mother and father compared to the norms.
4) In the subsequent stages of statistical analysis, the r-Pearson coefficient and the chi-square test were used.

Table 1. Parents' characteristics categorisation including level of education, body fat percentage, and physical activity

Variable		Mothers (%)	Fathers (%)
Education	Vocational	13.53	27.30
	Secondary	29.23	33.00
	Higher	57.25	39.70
Body fat percentage	Low	3.46	15.32
	Normal	38.75	48.19
	High	57.79	36.49
Physical activity	Low	29.02	14.25
	Normal	22.69	7.00
	High	48.28	78.74

Table 2. Descriptive statistics of parents' characteristics

Variable	M	Mdn	SD	Min	Max
Mother's age	35.17	35.00	4.94	23.00	50.00
Father's age	38.05	38.00	5.83	23.00	65.00
Mother's body fat (%)	31.55	30.70	8.93	8.40	61.40
Father's body fat (%)	22.56	23.30	8.32	4.20	61.70
Mother's physical activity – hours a month	27.30	29.10	13.62	0.00	61.40
Father's physical activity – hours a month	17.00	18.75	12.06	0.00	61.70

3.2. Ascribing attributes of healthy behaviour to different body types

First, we examined how children assessed the overall health of individuals with different body types (Question: *Show me which woman/man is healthier*; Figure 2).

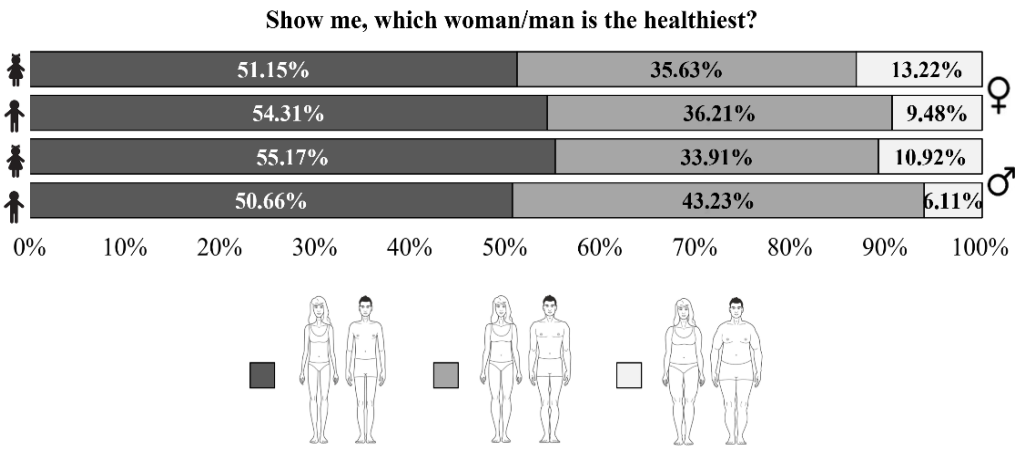

Figure 2. Assessment provided by girls and boys of overall health status of male and female silhouettes with different body types.

Independently of gender, the children were the most likely to indicate skinny bodies as healthier, both in the case of men and women. Bodies with normal weights were rated slightly less often as healthy ($p > .05$). In comparison to these two body types, obese body type was selected the least frequently ($p > .05$). In summary, there were no significant differences between sexes.

In the second step, we checked how children attributed pro- (Figure 3) and anti-health (Figure 4) behaviours to individuals with different body types (skinny, normal, overweight).

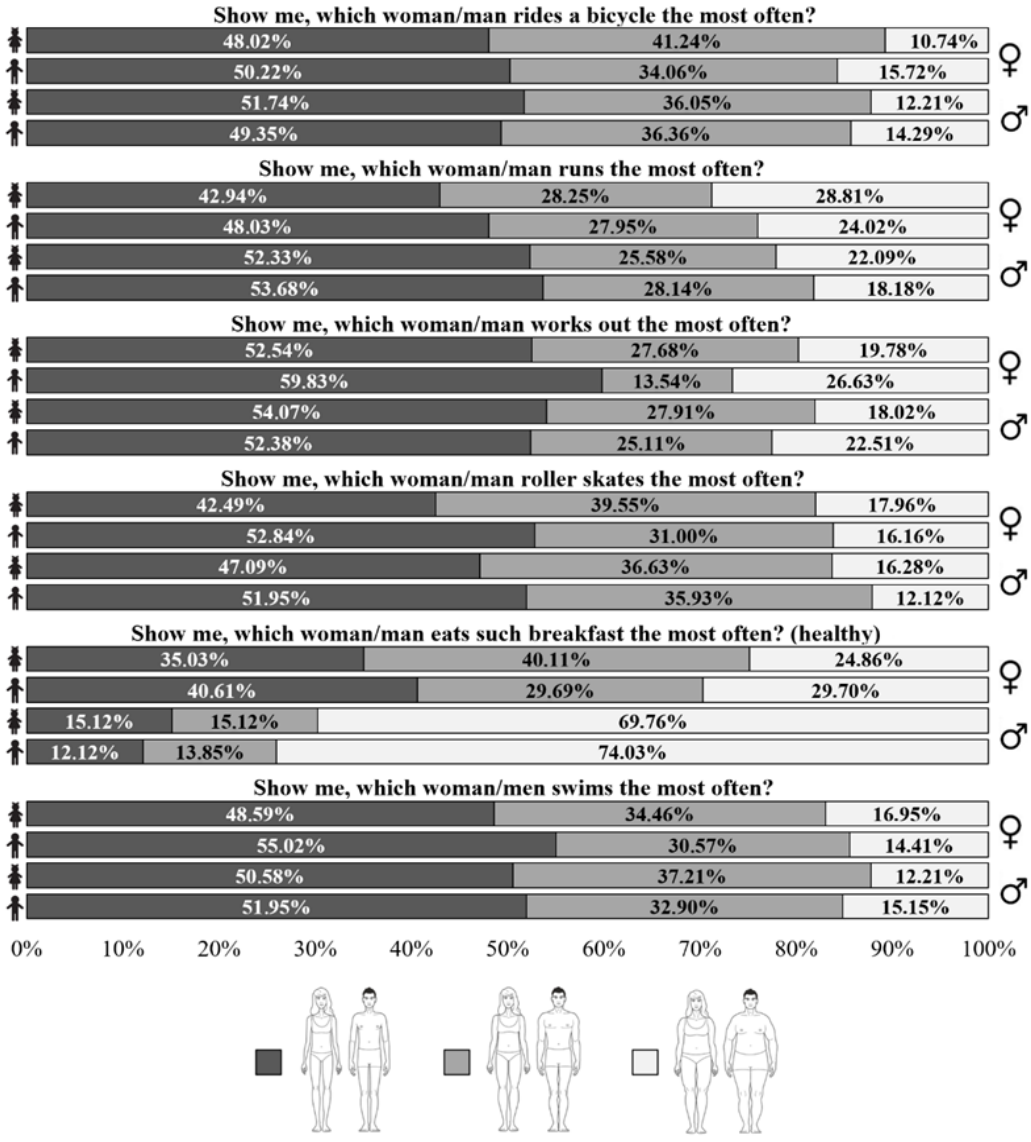

Figure 3. Body types selected by children when answering questions regarding pro-health behaviours

It is worth noting that when asked about participation in health-promoting PA (questions: *Show me which woman/man rides a bicycle/runs/works out/ roller skates/swims the most often*), the answers of girls and boys were similar, and the most frequently chosen silhouette was skinny rather than normal weight, and PA was not associated by children with individuals with obesity ($p > .05$). However, we noticed some interesting differences between boys and girls. For the question *'Show me which woman runs the most often?'*, girls selected the obese silhouette more often than boys ($\chi^2 = 0.72$, $p > .05$), often spontaneously commenting that 'women run to lose weight'. For the question *'Show me which woman/man*

works out the most often?' boys more often than girls connected obese silhouette with working out ($\chi^2 = 6.33$, $p = < .05$) as they believed that *'obese women go to the gym to lose weight, but men who weigh too much go to the gym to gain muscle'*.

We received surprising answers to the question, *'Show me which woman/man eats such breakfast the most often?'*. The picture presented to children showed typical 'healthy breakfast' – a glass of orange juice, muesli and fresh fruit. In this case, children, regardless of gender, gave starkly different responses for the female and male silhouettes ($\chi^2 = 83.22$, $p < .001$). The healthy breakfast was associated with skinny and normal female silhouettes, although boys were slightly more likely to indicate the skinny one ($\chi^2 = 2.40$, $p > .05$). However, in relation to men, they gave answers in the vein of *'men don't eat like that', 'it's not breakfast for healthy men', 'only obese men who are trying to lose weight eat like that'* ($\chi^2 = 0.51$, $p > .05$). Thus, Polish five-year-old children did not associate healthy breakfast with men's eating habits/preferences.

Interestingly, we obtained the opposite results for *'Show me which woman/man eats such breakfast the most often?'* when the picture presented an unhealthy breakfast (typical fast food burger, fries, and cola; Figure 4). Fast-food breakfasts were associated with obesity in women (*'they eat this way, so they are fat'*), but not in men ($\chi^2 = 94.55$, $p < .001$). Children often commented *'he is slim, such food will not harm him'*.

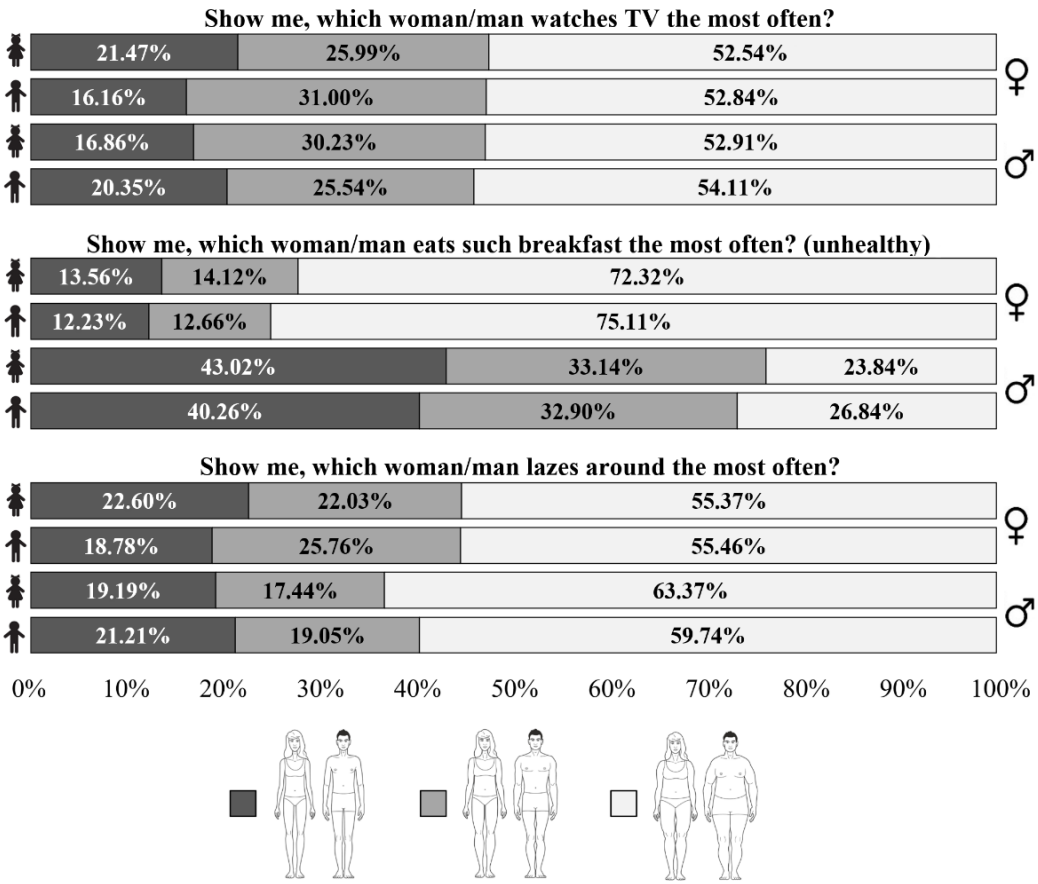

Figure 4. Body types selected by children when answering questions regarding anti-health behaviours

It is worth noting that the anti-health behaviours presented in the question *'Show me which woman/man watches TV/ lazes around the most often?'* were mostly associated with obese silhouettes ($p > .05$). Thus, children as young as five years old choosing the indicated adult figure may think that obese people are adults who are not physically active. It is clear that five-year-olds associate obesity with a lack of PA.

3.3. Health behaviours and appearance of parents' and children's perceptions of adult silhouettes: The role of passive modelling

To answer the first research question, statistical analysis was carried out to measure the relationship between the variables of PA, nutritional habits, and body fat percentage among parents (mother and father, independently) and the perceptions of adult body silhouettes by their five-year-old children. For this purpose, a correlation analysis was performed using Pearson's r coefficient; the values are presented in Table 3.

Table 3. Pearson's r coefficient between child's perception of pro- and anti-health behaviours and parents' characteristics

			Child's perception of pro-health behaviours						Child's perception of anti-health behaviours					
			BOYS											
			Female body type			Male body type			Female body type			Male body type		
			skinny	normal	obese	skinny	normal	obese	skinny	normal	obese	skinny	normal	obese
Parents' characteristics	Body fat %	Mother	.013	.108	-.152	.142	-.077	-.078	-.054	-.026	.048	-.048	.044	.004
		Father	-.060	.010	.001	.036	-.079	.044	-.105	.030	.019	.037	-.032	-.005
	Physical activity	Mother	-.060	.010	.001	.036	-.079	.044	-.105	.030	.019	.037	-.032	-.005
		Father	.013	.108	-.152	.142	-.077	-.078	-.054	-.026	.048	-.048	.044	.004
	Proper Nutrition Habits	Mother	.126	-.003	**-.206****	-.022	.080	-.054	-.119	.079	-.003	.055	.030	-.068
		Father	**.164***	-.128	-.148	.091	-.027	-.085	-.036	-.096	.055	-.009	-.107	.092
			GIRLS											
Parents' characteristics	Body fat %	Mother	-.086	.065	.032	-.004	-.054	.073	-.017	.020	-.002	-.095	.044	.049
		Father	.082	-.090	-.001	-.030	-.046	.094	.058	-.142	.062	.067	-.009	-.051
	Physical activity	Mother	-.086	.065	.032	-.004	-.054	.073	-.017	.020	-.002	-.095	.044	.049
		Father	.082	-.090	-.001	-.030	-.046	.094	.058	-.142	.062	.067	-.009	-.051
	Proper Nutrition Habits	Mother	-.048	.026	.028	-.129	**.224***	-.084	-.090	-.054	.114	.011	-.117	.076
		Father	.070	-.023	-.056	-.051	.035	.045	-.093	.096	.001	-.062	-.051	.096

Notes. * $p < .05$, ** $p < .01$

The values of the correlation coefficients indicated significant relationships between the parents' nutritional habits and the perception of adult silhouettes by their children of both sexes.

In relation to boys, two significant relationships were indicated. Interestingly, both were only concerned with the assessment of female silhouettes. The higher the level of the father's healthy eating habits, the more often the sons attributed health-promoting practices to the skinny female silhouette. In turn, the higher the level of healthy eating habits of the mother, the less frequently the sons associated health-promoting practices to obese female silhouettes (Table 3).

In girls, only one significant relationship was found, which was related to the assessment of the male silhouette. The healthier the mothers ate, the more often their daughters linked health-promoting behaviours with a medium-weight male figure (Table 3).

It should be noted that the intensity of the parents' PA and their objective and observable appearance parameters (body fat percentage) did not seem to play a significant role in the cognitive attribution of body shape to involvement in health practices.

A chi-square test of independence was performed to examine the importance of gender in the relationship between parents' health behaviours and appearance (passive modelling) and children's perception of adult silhouettes. The results confirm the importance of the child's gender in the above relationship. Five-year-old boys and girls perceived the bodies of men and women who eat healthy (health-promoting behaviour; Figure 3) or unhealthy

(anti-health; Figure 4) differently. In the case of boys, there was a $\chi^2 = 46.81$, $p < .001$ in unhealthy eating, and $\chi^2 = 40{,}10$, $p < .001$ in healthy eating. By contrast, in the case of girls there was a $\chi^2 = 47.44$, $p < .001$ in unhealthy eating, $\chi^2 = 40{,}52$, $p < .001$ in healthy eating. Surprisingly, despite the above significant differences, in other cases, our results did not confirm a significant impact of parental gender on the passive modelling of health-promoting and anti-health behaviours.

4. Discussion

Currently, increasing efforts are being made for developing body-focused health-promoting attitudes in children. The obesity epidemic and sedentary lifestyle of children and adolescents have resulted in the World Health Organization disseminating recommendations on practices to promote PA and healthy eating habits [48, 49]. This study sheds light on the specificity of children's attribution of health behaviours to adult body shapes as influenced by their observations of their parents' lifestyle.

4.1. Healthy = skinny and gender matters

Our study revealed that both boys and girls tend to view skinny bodies as healthy. In particular, the results indicate that five-year-old girls' perceptions of women's eating behaviours is important for their development and internalisation of the principle that a thin body is a healthy body (Figures 3 and 4). Most other studies involving children and adolescents also found that overweight silhouettes were considered 'unhealthy', while skinny figures were rated as attractive [50–52]. These results are consistent with the Objectification Theory of Fredrickson and Roberts [53], which confirms the importance of thinness as an important sociocultural factor of body attractiveness. Like many studies on this topic, our study confirmed the significant impact of sociocultural standards on the assessment of physical attractiveness, wherein a skinny body is promoted as attractive and normal, especially among girls and young women [54–57]. It has been found that the media and the toy industry have played a big role in propagating thinness as the standard for female physical attractiveness [58–60]. Harriger et al. [59] confirmed that exposure to images of Barbie dolls was associated with body dissatisfaction in children, especially in girls aged 5.5–7.5 years. In turn, Nesbitt et al. [58], examining a group of 6–10-year-old girls (slightly older than the participants of this study), found that the curvy Barbie doll, which has a fuller body, was associated with a positive emotional feeling related to the Barbie's figure. However, based on the perceptions of the surveyed 6–10-year-old girls, the original skinny Barbie dolls were the most desired and appreciated in terms of attractiveness. A review of the literature indicates that transgenerational trends in body image perception, which promote thinness as a beauty standard, especially among girls and young women, constitute a risk factor for the development of eating disorders [61]. Similar trends promoting thinness as an ideal of beauty were confirmed as risk factors for eating disorders in children. For example, Canals and Sancho [62] indicated that children are more likely to develop eating disorders if they see their parents struggling with their body image and chasing the ideal of thinness to become more attractive.

It is worth emphasising that most studies on the relationship between body shape and beauty and health focus on women and girls. In studies on men, the focus is more on the relationship between body appearance and fitness or health, rather than beauty [63–66].

A review of the literature indicates existing differences in findings on the perceptions of body image in boys and young men and the health behaviours used to maintain a lean or muscular male physique. Some researchers have indicated that males are more likely to have a more positive attitude towards their own body image compared to girls and women [25, 67]. However, some studies indicate that the differences in the body image perception between young girls and boys may be smaller than those between adolescent girls and boys [40, 68]. Other studies with boys and young men as participants indicate that having a lean and/or muscular body is an important sociocultural standard of male

attractiveness. Some studies have indicated that boys and men are pressured to work towards and attain the ideal of an athletic male figure with well-defined muscles [56, 69]. Social pressure to have an attractive male body shape is often associated with anti-health behaviours (including eating behaviours and PA), which are undertaken to attain the ideal male body [70]. This study yielded similar observations, because the findings indicate that proper eating behaviour in men (the so-called 'healthy breakfast') was associated with an overweight silhouette in the eyes of five-year-old boys. However, the same boys associated anti-health eating behaviours (the so-called 'unhealthy breakfast') with a slim male figure. Thus, it appears that unhealthy eating behaviours influence the distortion of the adult male body image in the assessment of adolescent boys and five-year-old boys. Furthermore, boys with eating disorders (having a distorted image of their own physique) are more influenced by incorrect perceptions of their own body than healthy boys [71].

The authors of this study remained consistent with the standards of research methodology adapted for young children [72] because of the use of the Beauty & Health Scale [45], which was adapted to the age of the examined children and their stage of development. Many studies show how the media influence behavioural patterns related to beauty and health [73, 74], and the role of family influence on these patterns is also emphasised [75–78].

In our own research, we focused on the role of passive modelling of 'healthy body' patterns by examining the relationship between the adult silhouettes indicated by children and the appearance and health behaviours of their parents. The relationship between parents' eating behaviours and children's choices was more clearly marked. This may be related not only to passive modelling, but also to the eating habits prevalent in the family [7, 79].

The most interesting result in this study is the different attribution of healthy eating habits to women and men. Unfortunately, despite many health campaigns [80, 81], the surveyed five-year-olds still believed that men do not have to eat healthy if they are not overweight. For men, healthy eating has been considered an 'intervention treatment'. Unfortunately, Polish pre-schoolers still exhibit a belief in the idea propagated in the last decade in newspapers that *'Real men don't diet'* [82].

We were surprised by the results indicating that the silhouette of the parent itself is not related to the attribution of adult shapes to specific health behaviours by their offspring. The findings of this study point to the need to build on this study further to verify the role of passive modelling through the health behaviours of parents towards children.

4.2. Active involvement in PA rather than passive modelling

According to our assumptions, children believe that health is related to both eating habits and PA. Previous research has confirmed the role of parental involvement in developing children's active participation in sports activities [83, 84]. In connection with the research question, the statistical analysis of the research results aimed at verifying whether and how the parent's (mother/father) PA perceived by their five-year-old son/daughter is important in modelling their health behaviours related to PA. Surprisingly, passive modelling, the observation of parents' involvement (or lack thereof) in sport activities, was not related to children's knowledge about the relationship between PA and the possibility of being overweight or underweight in adults. It seems that the active influence of parents and beliefs developed by observing them, but with the element of co-acknowledgement in social activities, play a much more important role than passive modelling. Encouraging children to be physically active is important because many studies indicate the huge role of PA in children's healthy development [85–89]. Some studies indicate that parental modelling of PA (especially between ages of 7–9 years old) improves the child's sense of happiness and reduces his/her free time spent without PA [90]. Parents who actively spend time with their children are perceived in society as caring and attentive to their children's development, thus helping to include PA in the repertoire of behaviours practiced in leisure time [83, 90].

This study did not confirm a strong relationship between passive parental modelling of PA and the child's perceptions of the appearance of an adult's body. A similar trend was noticed by Durocher and Gauvin [91] because in both boys and girls, the relationship between parents' modelling of PA towards children and children's involvement (improvement and/or deterioration) in participating in PA was not confirmed. Additionally, they reported that boys trying to gain weight were more likely to engage in PA, but this did not exclude them from eating healthy food (or fast food).

This study is consistent with the trend noted in other studies such as Kim et al. [90], Wallander and Koot [92] and Durocher and Gauvin [91] that the parent's attitude and behaviour towards PA are important for the PA of the offspring. However, an important element in modelling these behaviours between parent and child is the parent's active attitude (especially towards PA); a passive attitude is not sufficient for the process of parental modelling to inspire PA.

4.3. Limitations and strengths

In this study, randomisation and blinding techniques were not used for the study sample due to the lack of a control group. The aim was not to compare children's perceptions of male and female body shapes across different age groups. A large group of mother-father-child triads was gathered to investigate the relationship between children's perceptions of male and female body shapes, correlating this with PA levels, eating habits, and maternal and paternal fat percentage. The lack of longitudinal studies was also associated with the conscious selection of the age group. However, it would be worthwhile to conduct a longitudinal study in the future and compare perceptions of the female and male bodies by children in middle childhood, taking into account the PA, the measurement of body fat, and the parent's eating habits. The differences in the perceptions of the parents' bodies by children of different ages and whether body fat, eating habits, and PA depend on the child's age can be examined. A longitudinal survey is associated with the risk of the respondents' high motivation to complete the survey procedure. Making participation in the study interesting and not boring is especially important when the participants are children in the middle childhood stage. This study questionnaire had to include specific questions and could not have been too long because it was necessary to maintain the interest and concentration of five-year-old children. The transverse nature of the study was related to the desire to study a large group of mother-father-child triads and to obtain the most accurate results subject to statistical analysis.

5. Conclusions

Childhood is a particularly important period for developing health behaviours (nutrition and PA) that last into adulthood. Engaging in healthy behaviours reduces the risk of lifestyle diseases and improves quality of life [85, 93]. In the era of increasing civilisational threats resulting from an anti-health lifestyle, sedentary behaviour [94], excessive media use [94], unhealthy eating [96, 97], and lack of PA [98]) maintaining good health is a challenge. The family plays a key role in instilling proper health behaviours, and thus is an important contributor to public health [7, 84]. The niche nature of this study confirms that the family is an important environment for establishing the first health habits (pro-health and/or anti-health), in particular with regard to PA in the family.

WHO recommends that children and adolescents participate in an average of 60 minutes of PA (mainly aerobic) and engage in exercises strengthening the musculoskeletal system at least thrice a week [48]. In the process of disease prevention and promotion of health-consciousness and physical exercise in the family, health education that promotes and instils the habit of regular physical exercise in young children plays an important role. Implementation of PA health interventions for parents is also necessary because they have a direct impact on their children's PA development [99, 100].

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