

**Akademia Wychowania Fizycznego**  
**im. Eugeniusza Piaseckiego w Poznaniu**

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Rozprawa doktorska

**Wpływ lekcji wychowania fizycznego z elementami  
pedagogiki przeżyć na kompetencje społeczne młodzieży**



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Doctoral dissertation

The Impact of Physical Education with Elements of Adventure Education  
Program on Adolescents' Social Competence



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## I. AUTOREFERAT

Niniejsza rozprawa doktorska składa się z cyklu prac pod tytułem „Wpływ lekcji wychowania fizycznego z elementami pedagogiki przeżyć na kompetencje społeczne młodzieży.” Badania zostały sfinansowane w ramach projektu Rozwój Młodych Pracowników Nauki realizowanego na Akademii Wychowania Fizycznego w Poznaniu. Na cykl prac składają się dwa artykuły naukowe:

1. *The Impact of Physical Education Based on the Adventure Education Programme on Self-Esteem and Social Competences of Adolescent Boys.* International Journal of Environmental Research and Public Health. 2021; 18(6):3021.

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IF = 3.309, MNiSW = 140 pkt.

2. *Correlates of Social Competences among Polish Adolescents: Physical Activity, Self-Esteem, Participation in Sports and Screen Time.* Sustainability. 2021; 13(24):13845. <https://doi.org/10.3390/su132413845>

IF = 3.251, MNiSW = 100 pkt.

### Wstęp

Celem wychowania fizycznego (WF) w szkole ponadpodstawowej jest wszechstronny rozwój ucznia w sferze fizycznej, psychicznej, intelektualnej, emocjonalnej i społecznej oraz kształtowanie jego postaw wobec aktywności fizycznej i zdrowia przez całe życie [1]. Tak sformułowany cel obliguje nauczycieli WF do prowadzenia zajęć, które holistycznie oddziałują na wszystkie sfery rozwoju ucznia. Jedną z koncepcji odpowiadającą temu założeniu jest pedagogika przeżyć, która definiowana jest jako metoda ukierunkowana na rozwój jednostki, która poprzez udział w wyzwaniach fizycznych, psychicznych i społecznych rozwija kompetencje społeczne i osobiste, a w rezultacie kształtuje swoją proaktywną postawę życiową [2]. Opracowanie Sutherlanda i Legge [3] wskazuje możliwości włączenia pedagogiki przeżyć do programu nauczania WF oraz programu kształcenia nauczycieli. W związku z tym zasadne jest zbadanie w jakim stopniu pedagogika przeżyć może być pomocna w realizacji szkolnego WF. Pedagogika przeżyć zakłada rozwój kompetencji interpersonalnych i intrapersonalnych poprzez udział w aktywności fizycznej (AF), która jest bazowym elementem tej koncepcji. Wyniki badań pokazują, że pedagogika przeżyć może pozytywnie wpływać na kompetencje społeczne i samoocenę [4–6].

Kompetencje społeczne i samoocena wspierają jednostkę w jej skutecznym funkcjonowaniu zarówno w życiu prywatnym jak i szkolnym, a później w życiu zawodowym [7–10]. Warunkują one poczucie satysfakcji w różnych dziedzinach życia (takich jak praca, zdrowie, relacje interpersonalne) [11]. Ich kształtowanie jest ważne z perspektywy przygotowania ucznia do samodzielnego i odpowiedzialnego życia, dlatego oczekuje się, że szkoła będzie podejmowała działania na rzecz rozwoju tych ważnych zasobów młodzieży, z których uczniowie będą czerpać w okresie nauki szkolnej, a także w dalszej przyszłości po ukończeniu szkoły. Okres dorastania to ważny moment kształtowania kompetencji społecznych i samooceny. Jest to czas przygotowywania się do nowych ról społecznych w dorosłym życiu [12].

Kompetencje społeczne rozumiane są jako złożone umiejętności warunkujące efektywność radzenia sobie w określonych sytuacjach o charakterze społecznym, nabywane przez jednostkę podczas treningu społecznego [10]. Uczniowie, którzy prezentują niski poziom kompetencji społecznych są częściej wykluczani przez swoich rówieśników z kontaktów interpersonalnych, co może prowadzić do ograniczenia możliwości rozwoju tych kompetencji [13,14], oraz przyczyniać się do obniżenia samooceny [15,16]. Natomiast osoby o wyższym poziomie samooceny są bardziej odważne w kontaktach społecznych i nawiązywaniu nowych relacji niż osoby z niższą samooceną [13]. Efektywność funkcjonowania społecznego (w tym sukcesów życiowych jednostki) jest powiązana z poziomem kompetencji społecznych oraz z samooceną [10].

Rosenberg [17] definiuje samoocenę jako ogólną ocenę samego siebie. Może ona być dobra i wspierająca lub negatywna. Wysoka samoocena wiąże się z przekonaniem, że człowiek jest „wystarczająco dobry”, natomiast niska samoocena oznacza brak zadowolenia z siebie i prowadzi do odrzucenia własnego Ja [17]. Pozytywna samoocena wspiera jednostkę w podejmowaniu działań na rzecz własnego rozwoju i dbania o siebie, a także w dbaniu o innych. Odzwierciedla ona także poziom aprobaty i akceptacji społecznej, jaki aktualnie doświadcza człowiek [15]. Samoocena jest ważną częścią poczucia własnej wartości i postrzegana jest jako element zdrowia psychicznego oraz dobrego funkcjonowania w dorosłości [8,18]. Niski poziom samooceny wiąże się z problemami w zakresie zdrowia psychicznego (np. depresja, lęk, problemy z zachowaniem) [8,18,19]. Samoocena jest rozpatrywana jako ważny zasób człowieka, od którego zależy subiektywne poczucie szczęścia i satysfakcji życiowej [9].

Poziom samooceny jest skorelowany z różnymi zachowaniami zdrowotnymi, jak np. udziałem w zajęciach sportowych, poziomem AF, skłonnościami do uzależnień oraz zaburzeniami jedzenia [20–24]. Badania Russo i in. [22] pokazują, że AF ma wpływ na samoocenę młodzieży.

Zarówno kompetencje społeczne jak i samoocena są częścią rozwoju osobistego ucznia, która może być wspierana przez AF [25]. Z tej perspektywy lekcje WF dają możliwość prowadzenia zajęć, które wspierają kompetencje społeczne i samoocenę młodzieży, co ma odzwierciedlenie w celach zawartych w szkolnych programach WF [24,26]. W Polsce koncepcja pedagogiki przeżyć jako metody opartej na AF, wspierającej kompetencje osobiste młodzieży jest mało znana, mimo to są badacze, którzy zalecają włączenie pedagogiki przeżyć do szkolnych programów przedmiotowych, a w szczególności do programu WF [27,28].

W badaniach własnych zbadano wpływ lekcji WF z elementami pedagogiki przeżyć na kompetencje społeczne i samoocenę młodzieży (publikacja 1.) oraz zbadano związek kompetencji społecznych z samooceną, AF, czasem spędzonym przed ekranem oraz udziałem w zajęciach sportowych (publikacja 2.).

### **Cel badań**

Celem było zbadanie wpływu lekcji WF z elementami pedagogiki przeżyć na kompetencje społeczne i samoocenę młodzieży, oraz zbadanie związków między

kompetencjami społecznymi jako zmienną zależną, a zmiennymi niezależnymi: samooceną, AF, czasem spędzonym przed ekranem oraz udziałem w zajęciach sportowych.

Hipotezy badawcze:

- Udział w lekcjach WF z elementami pedagogiki przeżyć ma wpływ na rozwój kompetencji społecznych i samooceny uczniów (publikacja 1).
- Wyższy poziom samooceny, wyższy poziom AF i udział w zajęciach sportowych jest pozytywnie związany z wyższym poziomem kompetencji społecznych młodzieży, podczas gdy czas spędzony przed ekranem jest negatywnie związany z poziomem kompetencji społecznych (publikacja 2).

### **Material i metody badawcze**

*Narzędzia badawcze:*

W badaniach wykorzystano następujące kwestionariusze:

#### 1. Kwestionariusz kompetencji społecznych (wersja dla młodzieży) Matczak

Kompetencje społeczne zbadano przy użyciu polskiego Kwestionariusza kompetencji społecznych Anny Matczak, wersji dla młodzieży [10]. Składa się on z 90 twierdzeń, (z czego 60 to pozycje diagnostyczne) i przypisanej im czterostopniowej skali odpowiedzi (od 1 = *zdecydowanie źle* do 4 = *zdecydowanie dobrze*). Końcowy wynik stanowi sumę punktów za pozycje diagnostyczne i może być rozpatrywany jako wynik łączny kompetencji społecznych lub rozbity na trzy oddzielne skale następujących kompetencji: *skala I* dotyczy kompetencji warunkujących efektywność zachowań w sytuacjach bliskiego kontaktu interpersonalnego, *skala ES* dotyczy kompetencji warunkujących efektywność zachowań w sytuacjach ekspozycji społecznej, *skala A* dotyczy kompetencji warunkujących efektywność zachowań w sytuacjach wymagających asertywności. Alfa Cronbacha kwestionariusza wynosi 0.93-0.95, a Alfa Cronbacha dla próby badań własnych 0.81 - 0.95 (publikacja 1) oraz 0.95 (publikacja 2).

#### 2. Skala samooceny Rosenberga

Samoocenę zbadano przy użyciu polskiej wersji Skali samooceny Rosenberga [9]. Jest to jednowymiarowe narzędzie pozwalające ocenić poziom ogólnej samooceny. Kwestionariusz zawiera 10 twierdzeń i czterostopniową skalę odpowiedzi (od 1 = *bardzo się nie zgadzam się* do 4 = *bardzo się zgadzam*). Poszczególne twierdzenia są sformułowane w sposób pozytywny (nr 1,2,4,7) a punktacja im przypisana jest odwrócona, w taki sposób, żeby wyższa samoocena odpowiadała wyższej liczbie punktów. Alfa Cronbacha kwestionariusza wynosi 0.81-0.83, a Alfa Cronbacha dla próby badań własnych 0.89-0.92 (w publikacji 1) oraz 0.90 (w publikacji 2).

#### 3. Zachowania zdrowotne młodzieży szkolnej (The Health Behaviour in School Aged Children (HBSC)) wybrane pytania

Do zbadania poziomu AF, czasu spędzonego przed ekranem, udziału w zajęciach sportowych oraz zebrania danych socjo-ekonomicznych wykorzystano wybrane pytania z kwestionariusza HBSC [29]. Poziom AF wyznaczony został na podstawie wskaźnika ogólnego poziomu AF

(moderate and vigorous physical activity - MVPA). W celu bardziej szczegółowego opisu grupy użyto także pytań dotyczących wieku młodzieży, struktury rodziny, zamożności rodziny oraz wykształcenia rodziców.

Powyższy wstęp i charakterystyka wykorzystanych narzędzi jest wspólna dla obu publikacji, natomiast kolejna część autoreferatu najpierw omawia publikację 1., czyli:

- wpływ lekcji WF z elementami pedagogiki przeżyć na kompetencje społeczne i samoocenę chłopców

a następnie publikację 2., czyli:

- związek kompetencji społecznych młodzieży z samooceną, AF, czasem spędzonym przed ekranem oraz udziałem w zajęciach sportowych.

#### *Procedura i uczestnicy*

Uzyskano zgodę Komisji Bioetycznej przy Uniwersytecie Medycznym im. Karola Marcinkowskiego na przeprowadzenie badań własnych (decyzja nr 467/19).

#### Publikacja 1

Zastosowano eksperyment pedagogiczny z powtórzonymi pomiarami (pre - test i post - test) oraz grupą kontrolną. Grupa badana to chłopcy w wieku 15-16 lat, uczniowie szkoły ponadpodstawowej. W badaniu uczestniczyli uczniowie z czterech oddziałów klas szkolnych, z czego dwie klasy (n=40 chłopców) stanowiły grupę eksperymentalną, a dwie kolejne klasy (n=30 chłopców) stanowiły grupę kontrolną. Uzyskano potrzebne zgody do prowadzenia badań. Zapewniono uczniom dogodne warunki do wypełnienia ankiet. Do analiz wzięto pod uwagę tylko kompletnie wypełnione kwestionariusze. W badaniach uczestniczyli uczniowie klas mieszanych pod względem płci, jednak ze względu na małą liczebność dziewcząt analizie poddano wyłącznie wyniki chłopców.

Uczniowie z grupy eksperymentalnej wzięli udział w interwencyjnym programie realizowanym na lekcjach WF. Program zbudowany był zgodnie z założeniami pedagogiki przeżyć i realizował kolejno następujące po sobie fazy: uczestnictwo w doświadczeniu, refleksja, generowanie wniosków i ponowny udział w doświadczeniu. Program interwencji opierał się na założeniu, że rozwój kompetencji społecznych może nastąpić w ramach treningu społecznego [10] s. 7; dlatego zajęcia miały charakter praktyczny i opierały się na różnych formach aktywności fizycznej. Każda lekcja składała się z 3 podstawowych komponentów: rozgrzewki, następnie części głównej, czyli aktywności fizycznej wymagającej współpracy, budowania zaufania, wspólnego rozwiązywania problemów i ostatniego etapu; refleksji i transferu.

Program obejmował 24 jednostki lekcyjne i trwał jeden semestr szkolny. Lekcje WF z elementami pedagogiki przeżyć prowadzone były w bloku 2x45 minut raz w tygodniu. Celem programu było rozwijanie kompetencji społecznych i samooceny młodzieży poprzez udział w AF zgodnie z założeniami pedagogiki przeżyć. Uczestnicy wypełnili kwestionariusze przed przystąpieniem do programu (pre-test) oraz bezpośrednio po jego zakończeniu (post-test).

W grupie kontrolnej prowadzono zajęcia WF zgodnie ze standardowym/tradycyjnym programem WF przygotowanym i realizowanym w danej szkole. Uczestnicy wypełnili kwestionariusze na początku semestru (pre-test) oraz na koniec semestru (post-test) w terminach zbliżonych do wypełniania kwestionariuszy przez uczniów z grupy eksperymentalnej.

### *Analizy statystyczne*

Do analiz statystycznych użyto programu Statistica 13.0 (StatSoft Polska sp. Z o.o., 2020). Do zbadania różnic w kompetencjach społecznych i samoocenie między grupami (kontrolna i eksperymentalna) i terminami (pre-test i post-test) wykorzystano cztery oddzielne dwukierunkowe analizy wariancji ANOVA ( $2 \times 2$ ) oraz Test znaków. Różnice były uznawane za istotne statystycznie na poziomie  $p < 0.5$ . Wielkość efektu (Effect size) została podana dla istotnej różnicy ( $d$  poniżej 0,2 była nieistotna, 0,2 - 0,49 była mała, 0,50 - 0,8 była przeciętna, powyżej 0,8 oznaczała spadek).

### **Wyniki i dyskusja**

W grupie eksperymentalnej wykazano istotnie statystycznie różnice w poziomie kompetencji ujawnianych w sytuacjach wymagających asertywności oraz w poziomie kompetencji ujawnianych w sytuacji ekspozycji społecznej w porównaniu do grupy kontrolnej.

Nie wykazano istotnych statystycznie różnic w poziomie samooceny oraz kompetencji społecznych ujawnianych w sytuacji bliskich kontaktów interpersonalnych w porównaniu do grupy kontrolnej.

Celem badań była analiza wpływu lekcji WF z elementami pedagogiki przeżyć na kompetencje społeczne i samoocenę chłopców w wieku 15-16 lat. Postawiona hipoteza zakłada, że udział w lekcjach WF z elementami pedagogiki przeżyć rozwija kompetencje społeczne i samoocenę chłopców. Hipoteza badania została częściowo potwierdzona: lekcje WF z elementami pedagogiki przeżyć wpłynęły na rozwój kompetencji społecznych związanych z zachowaniem się w sytuacjach wymagających asertywności oraz kompetencji społecznych związanych z zachowaniem w sytuacji ekspozycji społecznej. Nastąpił wzrost kompetencji dotyczących skutecznego zachowania w sytuacjach ekspozycji społecznej i sytuacjach wymagających asertywności. Natomiast kompetencje ujawniane w zachowaniach bliskiego kontaktu interpersonalnego oraz samoocena nie uległy zmianie pod wpływem interwencji. Uzasadnieniem braku istotnych zmian w zakresie zachowań w sytuacji bliskiego kontaktu jest faza procesu grupowego uczestników badań (uczniów pierwszej klasy szkoły ponadpodstawowej). Zgodnie z założeniami dynamiki procesu grupowego, nowo poznający się uczniowie (pierwszej klasy) mogą mieć do siebie ograniczone zaufanie i potrzebują więcej czasu, żeby zbudować „bliski kontakt interpersonalny.” Brak więzi i niski poziom znajomości uczestników interwencji ograniczył rozwój umiejętności potrzebnych do skutecznego zachowania się w sytuacjach bliskiego kontaktu interpersonalnego [30].

Należy też wziąć pod uwagę fakt, że zmiany zachodzące w rozwoju uczestników zależą od wielkości grupy uczestniczącej w programach pedagogiki przeżyć [30]. Zalecana ilość osób to 7-15 uczestników [30], podczas gdy w lekcjach WF uczestniczy cała klasa (26 uczniów).

W badaniach własnych samoocena chłopców nie uległa zmianie istotnie statystycznie. Podobne wyniki dotyczące braku zmian w zakresie samooceny uzyskano w badaniach



Bartona i in. [31], które dotyczyły analizy skuteczności interwencji programu pedagogiki przeżyć. Uczestnikami tego badania byli nastoletni chłopcy, którzy brali udział w programie pedagogiki przeżyć organizowanej poza szkołą, na łonie natury. Ich poziom samooceny przed programem i po programie był zbliżony. Inne badanie dotyczące stabilności samooceny dorastających chłopców, przeprowadzili Moksnes i Reidunsdatter [18]. Zbadali oni samoocenę uczniów na początku semestru (pre-test), a następnie na koniec roku szkolnego (post-test). Ich analizy wskazują dużą stabilność samooceny w ciągu roku szkolnego [18]. Uzyskane wyniki mogą wzmacniać perspektywę teoretyczną, zgodnie z którą samoocena jest postrzegana jako względnie stała cecha [19].

Pozytywne efekty programów na bazie pedagogiki przeżyć są dobrze udokumentowane [4,32,33]. Jednakże w polskim kontekście edukacyjno-kulturowym cykliczne zajęcia WF z elementami pedagogiki przeżyć są innowacyjnym eksperymentem. Badania własne uzupełniają obecną literaturę przedmiotu, zgodnie ze wskazaniem i rekomendacjami [27,28].

Niniejsze badania opracowano przy założeniu, że doskonalenie kompetencji społecznych jest jednym z celów WF jak wynika z podstawy programowej [1]. Przedstawione wyniki dostarczają dowodów na to, że rozwijanie kompetencji społecznych może być osiągalnym celem WF. Nauczyciele WF mogą wspierać kompetencje społeczne uczniów poprzez tworzenie i wdrażanie specjalnie zaprojektowanych programów z wykorzystaniem pedagogiki przeżyć.

Ograniczeniem jest brak możliwości przeprowadzenia trzeciego terminu badań, który sprawdziłby trwałość efektów w dłuższej perspektywie czasowej. Zgodnie z badaniami Neill i Richards [34], efekty programów opartych na pedagogice przeżyć wydają się nie tylko być trwałe, ale także dalej wzrastać. Drugi post-test (trzeci termin badania) został zaplanowany po 5.miesiącach od zakończenia interwencji i miał odbyć się przed zakończeniem roku szkolnego 2020 r. Niestety, zaplanowane działania nie zostały zrealizowane z powodu pandemii Covid- 19.

Odnosząc się do sytuacji pandemicznej, można zauważyć potencjalny obszar wykorzystania doniesień z niniejszych badań. Izolacje domowe towarzyszące młodzieży, kwarantanny, nauczanie zdalne i inne formy ograniczenia społecznego funkcjonowania mają negatywny wpływ na zmiany psychologiczne i społeczne. Uczniowie narażeni są na obniżenie dobrostanu [35,36]. Program zajęć oparty na pedagogice przeżyć może wesprzeć działania wychowawców, nauczycieli i opiekunów młodzieży po pandemii w odbudowie relacji interpersonalnych i kształtowaniu kompetencji społecznych.

Należy dodać, że badanie zostało przeprowadzone w jednej ze szkół ponadpodstawowych w Poznaniu, zatem wyniki nie mogą być uogólniane na całą polską populację młodzieży.

Badania własne zaprojektowano zgodnie z rekomendacjami badaczy analizujących skuteczność programów rozwijających kompetencje społeczne młodzieży. Rekomendowali oni poprawę metodologii badań nad programami rozwijającymi kompetencje społeczne [37,38]. W związku z tym, wprowadzono rygor metodologiczny w ocenie skuteczności programu: zastosowano narzędzia pomiarowe o wykazanej rzetelności i trafności oraz włączono grupę kontrolną. Obie grupy uczestniczyły w dwóch terminach badania (pre-test i post-test).

Dużą zaletą jest dostosowanie badań, do zaleceń McKenzie [30], które wskazują na konieczność weryfikacji korzyści płynących z uczestnictwa w programach bazujących na pedagogice przeżyć organizowanych w środowiskach codziennego funkcjonowania

(np. szkole) [30]. Niniejsze badania dostosowane zostały do zaleceń McKenzie i przeprowadzone w środowisku znanym nastolatkom, w przestrzeni szkolnej na lekcjach WF.

WF z elementami pedagogiki przeżyć realizuje cele i zadania podstawy programowej nauczania WF, dlatego może stanowić wsparcie metodyczne dla nauczycieli WF lub trenerów sportowych.

Wnioski z publikacji 1 są przedstawione na końcu niniejszego autoreferatu jako część wspólna dla publikacji 1 i 2. Poniżej przedstawiono kolejne części publikacji 2, by następnie wspólnie podsumować 2 prace.

### *Procedura i uczestnicy*

#### Publikacja 2

Grupa badana to 106 nastolatków (84 chłopców i 22 dziewczęta) w wieku 15-16 lat. Uzyskano pisemne zgody rodziców na udział ich dzieci w badaniu. Podczas analiz statystycznych włączono tylko kompletne zestawy danych. Uczniowie wypełnili kwestionariusze w komfortowych warunkach.

#### *Analizy statystyczne*

Do analiz statystycznych użyto programu Statistica 13.1 (StatSoft Polska sp. Z o.o., 2021). Zastosowano Test Manna-Whitneya (Z) do oceny statystycznej istotności związku między zmiennymi niezależnymi a kompetencjami społecznymi oraz zmiennymi niezależnymi między sobą. Oceniono istotność i moc związków między zmiennymi przy pomocy współczynników korelacji rang Spearmana, zgodnie z kategoriami:  $\leq 0,39$  słaba,  $0,40-0,59$  umiarkowana i  $\geq 0,60$  silna [39]. Zastosowano test chi - kwadrat Pearsona. Zbudowano model analizy wieloczynnikowej hierarchicznej z kompetencjami społecznymi jako zmienna zależna w celu sprawdzenia hipotezy badawczej. Do modelu włączono tylko te zmienne, które istotnie korelowały z kompetencjami społecznymi. W pierwszym kroku do modelu włączono samoocenę, w drugim włączono MVPA. Ostateczny model był istotny i wyjaśniał znaczną część wariacji w poziomie kompetencji społecznych. Istotność wszystkich procedur przyjęto na poziomie  $p < 0,05$  w całej analizie.

### **Wyniki i dyskusja**

#### *Analizy wstępne*

Wykazano, że wraz ze wzrostem kompetencji społecznych, wzrasta poziom samooceny uczniów. Związek jest umiarkowanie istotny statystycznie. Wykazano też, że wyższy poziom kompetencji społecznych występuje u osób z wyższym poziomem MVPA  $\geq 5$  dni/tydzień, niż u osób z niższym MVPA  $< 5$  dni/tydzień, a związek jest istotny statystycznie. Nie wykazano związków istotnych statystycznie między kompetencjami społecznymi a czasem spędzonym przed ekranem, ani kompetencjami społecznymi a udziałem w zajęciach sportowych.

#### *Hierarchiczny model regresji dwuczynnikowej*

Zbudowano hierarchiczny model regresji dwuczynnikowej z kompetencjami społecznymi jako zmienna zależna. Model zawiera dwie zmienne niezależne (samoocenę oraz MVPA), które korelowały istotnie statystycznie z kompetencjami społecznymi.

Celem głównym badań własnych jest zbadanie związku kompetencji społecznych z samooceną, AF, czasem spędzonym przed ekranem oraz udziałem w zajęciach sportowych wśród młodzieży. Postawiona hipoteza została częściowo potwierdzona, co oznacza, że kompetencje społeczne młodzieży są związane z samooceną i AF (która została wyznaczona na podstawie wskaźnika MVPA). Natomiast kompetencje społeczne nie są związane z czasem spędzonym przed ekranem ani uczestnictwem w zajęciach sportowych.

Związek kompetencji społecznych z samooceną potwierdza wyniki innych badań, w których analizy korelacyjne wykazały, że kompetencje społeczne były pozytywnie związane z samooceną [19,40,41]. Związek kompetencji społecznych z AF potwierdza poprzednie badania własne opisane w publikacji 1. Dotyczy ono wpływu lekcji WF z elementami pedagogiki przeżyć na rozwój kompetencji społecznych młodzieży [42]. Podobne doniesienia opisane zostały również w innych programach interwencyjnych wykorzystujących AF, np. edukacji wspólnego uczenia się [43].

Wykazanie korelacji samooceny oraz AF jako predyktorów kompetencji społecznych umożliwia lepsze zrozumienie natury kompetencji społecznych, a dzięki temu wspiera projektowanie bardziej skutecznych interwencji, których celem jest rozwój kompetencji społecznych młodzieży.

Badanie kompetencji społecznych nastolatków i analiza ich predyktorów są bardzo istotne w kontekście projektowania działań na rzecz rozwoju kompetencji społecznych młodzieży. Większość uczniów nie spełnia zaleceń dotyczących AF [44], dlatego lekcje WF są ważną okazją do podejmowania AF [45], a tym samym umożliwiają doskonalenie kompetencji społecznych warunkujących efektywne funkcjonowanie w życiu.

## **Wnioski**

### Publikacji 1 i 2

- 1) Wprowadzenie 5-miesięcznego programu lekcji WF z elementami pedagogiki przeżyć prowadzi do poprawy funkcjonowania uczniów w zakresie kompetencji społecznych niezbędnych w sytuacjach wymagających asertywności oraz w sytuacjach związanych z ekspozycją społeczną. Program ten nie wpływa na kompetencje ujawniane w bliskich relacjach interpersonalnych. Udział w programie nie poprawia samooceny uczniów, ale wpływa pozytywnie na stabilność tej cechy.
- 2) Związek samooceny oraz AF w znaczącym stopniu wyjaśnia poziom kompetencji społecznych. Odkrycie to wspiera projektowanie bardziej skutecznych interwencji, których celem jest rozwój kompetencji społecznych młodzieży.
- 3) Lekcje WF stanowią sposobność do rozwoju kompetencji społecznych oraz samooceny młodzieży dzięki udziałowi w aktywności fizycznej. Jest to ważne, szczególnie teraz, gdy kształtowanie zarówno kompetencji społecznych jak i samooceny zostały mocno ograniczone przez naukę zdalną/kwarantanną/izolacją spowodowaną pandemią COVID - 19.
- 4) Przedstawione wyniki badań dostarczają dowodów na to, że lekcje WF z elementami pedagogiki przeżyć wpływają na wszechstronny rozwój uczniów, podnosząc

ich umiejętności społeczne niezbędne w kontaktach interpersonalnych z rówieśnikami i dorosłymi zarówno w rzeczywistości szkolnej, jak i innych obszarach życia społecznego. Nauczyciele WF mogą poprawić kompetencje społeczne uczniów poprzez tworzenie i wdrażanie specjalnie zaprojektowanych programów z wykorzystaniem pedagogiki przeżyć.

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## II. STRESZCZENIE

**Cel:** Celem pracy była analiza wpływu lekcji WF z elementami pedagogiki przeżyć na kompetencje społeczne i samoocenę młodzieży, oraz analiza związku między kompetencjami społecznymi a samooceną, AF, czasem spędzonym przed ekranem oraz udziałem w zajęciach sportowych.

### **Metoda i uczestnicy:**

W eksperymencie wzięło udział 70 chłopców w wieku 15-16 lat, z czego 40 uczniów włączono do grupy badanej, a 30 uczniów do grupy kontrolnej. Zastosowano kwestionariusze przed rozpoczęciem eksperymentu (pre-test) i po zakończeniu eksperymentu (post - test). Uzyskane dane analizowano między terminami i między grupami (przy użyciu ANOVA 2x2).

Ponadto zrealizowano badania wśród 106 uczniów w wieku 15-16 lat (84 chłopców i 22 dziewczyn). Zbadano korelacje występujące pomiędzy zmiennymi: kompetencje społeczne, AF, samoocena, czas spędzony przed ekranem oraz udział w zajęciach sportowych.

**Wyniki:** ANOVA ( $2 \times 2$ ) dla interakcji grupy x czasu wykazała różnicę istotną statystycznie kompetencji społecznych ujawnianych w sytuacjach ekspozycji społecznej oraz dla kompetencji wymagających asertywności. Ponadto wykazano umiarkowany istotnie statystycznie związek między kompetencjami społecznymi a samooceną. Wykazano również, że młodzież o wyższym poziomie AF (moderate to vigorous physical activities = MVPA);  $\geq 5$  dni/tydzień ma istotnie wyższy poziom kompetencji społecznych niż młodzież o niższym poziomie MVPA. Zbudowano hierarchiczny model regresji dwuczynnikowej i odkryto wewnętrzną korelację między zmiennymi niezależnymi: samooceną i aktywnością mierzona wskaźnikiem MVPA, która w znacznym stopniu pozwala przewidywać poziom kompetencji społecznych młodzieży.

**Wnioski:** Lekcje WF z elementami pedagogiki przeżyć pozytywnie wpływają na rozwój kompetencji społecznych chłopców ujawnianych w sytuacjach ekspozycji społecznej oraz w sytuacjach wymagających asertywności. Wprowadzenie założeń pedagogiki przeżyć do programu lekcji WF jest skutecznym sposobem na kształtowanie kompetencji społecznych poprzez AF.

Istnieje istotny statystycznie związek kompetencji społecznych z samooceną i AF. Istnieje korelacja między samooceną a AF, która w dużym stopniu pozwala przewidywać poziom kompetencji społecznych. Wnioski z badań mogą wspierać nauczycieli WF oraz trenerów sportowych, którzy chcą rozwijać kompetencje społeczne młodzieży poprzez udział w AF. Rekomendacje z badań mogą być szczególnie przydatne w planowaniu działań szkolnych w celu niwelowania niekorzystnych skutków pandemii Covid-19 w obszarze funkcjonowania społecznego młodzieży.

### III. DISSERTATION SUMMARY

This doctoral dissertation consists of a series of papers titled “The Impact of Physical Education with Elements of Adventure Education Program on Adolescents’ Social Competence.” The research was funded under the Development of Young Research Workers project carried out at the Academy of Physical Education in Poznan. The series consists of two research articles:

1. *The Impact of Physical Education Based on the Adventure Education Program on Self-Esteem and Social Competences of Adolescent Boys*. International Journal of Environmental Research and Public Health. 2021; 18(6):3021.  
<https://doi.org/10.3390/ijerph18063021>  
IF = 3.309, MNiSW = 140 pt.
2. *Correlates of Social Competences among Polish Adolescents: Physical Activity, Self-Esteem, Participation in Sports and Screen Time*. Sustainability. 2021; 13(24):13845. <https://doi.org/10.3390/su132413845>  
IF = 3.251, MNiSW = 100 pt.

#### Introduction

The purpose of Physical Education (PE) classes in secondary school is comprehensive development of pupils’ physical, mental, intellectual, emotional and social spheres and formation of attitudes towards physical activity and lifelong health [1]. A goal formulated in such a way obliges PE teachers to conduct classes that holistically affect all spheres of their pupils’ development. One concept corresponding to this premise is adventure education, which is defined as a method focused on the development of an individual who, through participation in physical, mental, and social challenges, develops social and personal competence and, as a result, shapes their proactive attitude to life [2]. The study by Sutherland and Legge [3] indicates the possibilities of integrating adventure education into the PE curriculum and teacher education. Therefore, it is reasonable to examine to what extent adventure education can be helpful in the implementation of PE at schools. Adventure education builds on the development of interpersonal and intrapersonal competence through participation in physical activity (PA), which constitutes the foundation of this concept. Findings show that adventure education can have a positive impact on social competence and self-esteem [4–6].

Social competence and self-esteem support the individual’s effective functioning in both personal and school life, and later in professional life [7–10]. They condition a sense of satisfaction in various areas of life (such as work, health, or interpersonal relationships) [11]. Their formation is important from the perspective of preparing pupils for an independent and responsible life, so it is expected that schools will take measures to develop these important resources in youth for the pupils to use during their schooling, as well as in the future after graduation. Adolescence is an important time for the formation of social competence and self-esteem. It is a time of preparation for new social roles in adult life [12].

Social competence is understood as complex skills conditioning the effectiveness of dealing with specific social situations, acquired by an individual during social training [10]. Pupils who display low levels of social competence are more likely to be excluded from

interpersonal relationships by their peers, which may in turn lead to limited opportunities to develop such competence [13,14]and contribute to lower self-esteem[15,16]. In contrast, people with higher levels of self-esteem are more adventurous in social interactions and establishing new relationships than people with lower self-esteem[13]. The effectiveness of social functioning (including an individual's success in life) is related to the level of social competence and self-esteem [10].

Rosenberg [17] defines self-esteem as a general evaluation of oneself. It can be good and supportive or bad and have a negative impact. High self-esteem is associated with the belief that one is "good enough," while low self-esteem implies a lack of self-satisfaction and leads to rejection of one's Self [17]. Positive self-esteem supports the individual in taking action for their own development and in caring for others. It also reflects the level of social approval and acceptance that the individual is experiencing at the moment [15]. Self-esteem is an important part of self-worth and is seen as part of mental health and good functioning as an adult [8,18]. Low self-esteem is associated with mental health problems (e.g., depression, anxiety, behavioral problems) [8,18,19]. Self-esteem is considered an important resource for humans, conditioning subjective feelings of happiness and life satisfaction [9].

Self-esteem levels are correlated with various health behaviors, such as sports participation, PA levels, addiction tendencies, and eating disorders [20–24]. Research by Russo et al. [22] shows that PA has an impact on the self-esteem of youth.

Both social competence and self-esteem are part of a pupil's personal development, which can be supported by PA [25]. From this perspective, PE classes provide opportunities for instruction that promotes young people's social competence and self-esteem, which is reflected in the goals included in PE curricula [24,26]. In Poland, the concept of adventure education as a method based on PA and supporting the personal competence of youth is not very well-known; however, there are researchers who recommend including adventure education in school curricula, especially in PE [27,28].

Our research examined the impact of PE classes with elements of adventure education on adolescents' social competence and self-esteem (publication 1) and the relationship between social competence and self-esteem, PA, screen time, and participation in sports (publication 2).

### **Purpose of the study**

The purpose of the study was to investigate the impact of PE classes with elements of adventure education on adolescents' social competence and self-esteem, and to examine the relationship between social competence as the dependent variable and the independent variables of self-esteem, PA, screen time, and participation in sports activities.

Research hypotheses:

- Participation in PE classes with elements of adventure education has an impact on the development of pupils' social competence and self-esteem (Publication 1).
- Higher levels of self-esteem, higher levels of PA, and participation in sports correlates positively with higher levels of social competence in adolescents,

while screen time correlates negatively with levels of social competence (Publication 2).

## **Materials and research methods**

### *Research Tools:*

The following questionnaires were used in the study:

#### 1. Social Competence Questionnaire (adolescent version) by Matczak

Social competence was measured using Anna Marczak's Polish Social Competence Questionnaire, adolescent version [10]. The questionnaire consists of 90 statements (60 of which are diagnostic items) and an assigned four-point response scale (from 1 = *definitely badly* to 4 = *definitely well*). The final score is the sum of scores for the diagnostic items and can be considered as a total social competence score or broken down into three separate scales: *scale I* concerns competence conditioning the effectiveness of behaviors in close interpersonal contact situations, *scale ES* concerns competence conditioning the effectiveness of behaviors in social exposure situations, *scale A* concerns competence conditioning the effectiveness of behaviors in situations requiring assertiveness. The Cronbach's alpha of the questionnaire is 0.93-0.95, and the Cronbach's alpha for the study sample is 0.81 - 0.95 (publication 1) and 0.95 (publication 2).

#### 2. Rosenberg Self-Esteem Scale

Self-esteem was examined using the Polish version of the Rosenberg Self-Esteem Scale [9]. It is a one-dimensional tool for assessing the level of overall self-esteem. The questionnaire contains 10 statements and a four-point response scale (from 1 = *strongly disagree* to 4 = *strongly agree*). Individual statements are positively worded (1,2,4,7) and the scores assigned to them are reversed: higher self-esteem corresponds to higher scores. The Cronbach's alpha of the questionnaire is 0.81-0.83, and the Cronbach's alpha for the study sample is 0.89-0.92 (in publication 1) and 0.90 (in publication 2).

#### 3. Health Behaviour in School Aged Children (HBSC) – selected questions

Selected questions from the HBSC questionnaire were used to examine PA levels, screen time, participation in sports, and to collect socioeconomic data [29]. The level of PA was determined by the general PA level index (moderate and vigorous physical activity – MVPA). Questions about the adolescents' age, family structure, family financial situation, and parents' education were also used to describe the group in more detail.

While the above introduction and characteristics of the tools used are common to both publications, the next section of the summary of professional accomplishments first discusses publication 1:

- the impact of PE classes on the social competence and self-esteem of boys,

followed by publication 2:

- the correlation of adolescents' social competence with self-esteem, PA, screen time, and participation in sports.

### *Procedure and participants*

The study was approved by the Bioethics Committee of Karol Marcinkowski Medical University (decision no. 467/19).

### *Publication 1*

An educational experiment was performed with repeated measures (pre-test and post-test) and a control group. The study group consisted of boys aged 15-16, high school pupils. Pupils from four school grade sections participated in the study, with two grades (n=40 boys) constituting the experimental group and another two grades (n=30 boys) constituting the control group. The necessary approvals to conduct the study were obtained. A convenient environment was provided for the pupils to complete the surveys. Only fully completed questionnaires were taken into consideration. The study included mixed-gender classrooms; however, due to the small number of girls, only boys' performance was analyzed.

Pupils in the experimental group participated in an intervention program implemented during PE classes. The program was structured in line with the assumptions of adventure education and followed sequential phases: participation in the adventure, reflection, generating conclusions, and participation in the adventure again. The intervention program was based on the idea that social competence can be developed through social training [10] p. 7; therefore, the activities were practical and based on different forms of physical activity. Each class consisted of 3 basic components; a warm up, then the main part, which is a physical activity that requires collaboration, trust building, collaborative problem solving, and the final step: reflection and transfer.

The program included 24 learning units and lasted one school term. PE classes with elements of adventure education were taught in a 2x45 minute block once a week. The goal of the program was to develop the social competence and self-esteem of youth through participation in PA in accordance with the assumptions of adventure education. The participants completed questionnaires before entering the program (pre-test) and immediately after completing the program (post-test).

In the control group, PE classes were conducted according to the standard/traditional PE curriculum as prepared and implemented in the school. The participants completed questionnaires at the beginning of the term (pre-test) and at the end of the term (post-test) at similar times as the experimental group.

### *Statistical analyses*

Statistica 13.0 (StatSoft Polska sp. Z o.o., 2020) was used for statistical analyses. Four separate two-way ANOVA ( $2 \times 2$ ) analyses of variance and a Sign Test were used to examine differences in social competence and self-esteem between groups (control and experimental) and terms (pre-test and post-test). Differences were considered statistically significant at the  $p < 0.5$  level. The effect size was provided for significant difference ( $d$  lower than 0.2 was nonsignificant, 0.2 - 0.49 was small, 0.50 - 0.8 was average, above 0.8 indicated a decrease).

## **Results and discussion**

The experimental group showed statistically significant differences in the level of competence revealed in situations requiring assertiveness and in situations of social exposure compared to the control group.

There were no statistically significant differences in the level of self-esteem and social competence revealed in close interpersonal situations compared to the control group.

The purpose of the study was to analyze the impact of PE classes with elements of adventure education on social competence and self-esteem of boys aged 15-16. The hypothesis posed is that participation in PE classes with elements of adventure education develops boys' social competence and self-esteem. The hypothesis was in part confirmed: PE classes with elements of adventure education influenced the development of social competence related to behavior in situations requiring assertiveness and to behavior in situations of social exposure. There was an increase in competence regarding effective behavior in social exposure and assertiveness situations. In contrast, competence exhibited through close interpersonal contact behaviors and self-esteem did not change as a result of the intervention. The rationale for the lack of significant changes in close contact behavior is the group process phase of the study participants (first grade high school pupils). According to the group process dynamics, newly acquainted (first grade) pupils may have limited trust in each other and need more time to build "close interpersonal contact." Lack of bonds and low levels of familiarity among intervention participants limited the development of skills needed for them to behave effectively in close interpersonal situations [30].

It is also important to consider that the changes that occur in the development of participants depend on the size of the group participating in adventure education programs [30]. The recommended number of participants is 7-15 [30] while PE lessons involve the participation of the whole class (26 pupils).

In the presented study, boys' self-esteem did not change in a statistically significant way. Similar results regarding the lack of change in self-esteem were obtained in the study by Barton et al. [31] which involved analyzing the effectiveness of an adventure education program intervention. The participants in this study were adolescent boys who participated in an adventure education program held outside of school, in the nature. Their levels of self-esteem before and after the program were similar. Another study on the stability of adolescent boys' self-esteem was conducted by Moksnes and Reidunsdatter [18]. They examined pupils' self-esteem at the beginning of the term (pre-test) and then at the end of the school year (post-test). Their analyses indicate high stability of self-esteem over the school year [18]. The results obtained may reinforce the theoretical perspective that self-esteem is a relatively fixed trait [19].

The positive effects of adventure education-based programs are well-documented [4,32,33]. However, in the Polish educational and cultural context, cyclical PE classes with elements of adventure education are an innovative experiment. The present research adds to the literature on the subject to-date, as indicated and recommended [27,28].

The study was developed upon the assumption that improving social skills is one of the objectives of PE as stated in the core curriculum [1]. The results presented here provide evidence that developing social competence can be an achievable goal of PE classes. PE teachers can support pupils' social competence by creating and implementing specially designed programs with elements of adventure education.

A limitation to the study is the lack of possibility to conduct a third test at a later date to examine the sustainability of the effects over time. According to research by Neill and Richards [34], the effects of programs based on adventure education appear not only to be sustainable, but to continue to grow. A second post-test (third study date) was scheduled 5 months after the end of the intervention and was to take place before the end of the 2020 school year. Unfortunately, it was not carried out due to the Covid 19 pandemic.

With reference to the pandemic situation, a potential area for use of the results of the present study can be seen. Adolescents' home isolation, quarantines, distance learning, and other forms of restriction of social functioning have negative effects on psychological and social development. Pupils risk a decrease in their well-being [35,36]. An activity program based on adventure education can support the activities of educators, teachers, and caregivers of post-pandemic youth in rebuilding interpersonal relationships and developing social competence.

It should be added that the study was conducted in a secondary school in Poznan, so the results cannot be generalized to the entire Polish youth population.

The study was designed according to the recommendations of researchers analyzing the effectiveness of programs developing social skills of youth. They recommended improving the methodology of research on programs developing social skills [37,38]. Therefore, methodological rigor was introduced in the evaluation of the effectiveness of the program: measurement tools with demonstrated reliability and relevance were used and a control group was included. Both groups participated in two study dates (pre-test and post-test).

A great advantage is the compliance of the research with the McKenzie recommendations [30], which point to the need to verify the benefits of participating in programs based on adventure education organized in everyday environments (e.g. school) [30]. The present study was adapted to McKenzie's recommendations and conducted in an environment familiar to adolescents: in the school space during PE classes.

PE with elements of adventure education implements the goals and tasks of the core curriculum of PE teaching and as such can constitute methodical support for PE teachers or sports coaches.

The conclusions of publication 1 are presented at the end of this summary of professional accomplishments as a common section for publications 1 and 2. Below, further parts of publication 2 are presented and the two papers are summarized together.

### *Procedure and participants*

#### *Publication 2*

The study group consisted of 106 adolescents (84 boys and 22 girls) aged 15-16. Written parental consent was obtained for the children to participate in the study. Only complete data sets were taken into consideration in statistical analyses. The pupils completed the questionnaires in a convenient environment.

#### *Statistical analyses*

Statistica 13.1 (StatSoft Polska sp. Z o.o., 2021) was used for statistical analyses. The Mann-Whitney (Z) Test was used to assess the statistical significance of the relationship between the independent variables and social competence, and between the independent variables. The

significance and strength of associations between variables were assessed using Spearman's rank correlation coefficients, according to the categories:  $\leq 0.39$  weak, 0.40-0.59 moderate and  $\geq 0.60$  strong [39]. Pearson's chi-square test was used. A multivariate hierarchical analysis model was built to test the research hypothesis with social competence as the dependent variable. Only variables that significantly correlated with social competence were included in the model. In the first step, self-esteem was included in the model; in the second step, MVPA was included. The final model was significant and explained much of the variance in the social competence level. Significance of all procedures was taken at  $p < 0.05$  throughout the analysis.

## **Results and discussion**

### *Preliminary analyses*

It was shown that an increase in social competence correlates with increasing pupils' self-esteem. The association is moderately statistically significant. It was also shown that higher levels of social competence were found in those with higher MVPA  $\geq 5$  days/week than in those with lower MVPA  $< 5$  days/week, and the association was statistically significant.

There were no statistically significant associations between social competence and screen time, or between social competence and participation in sports activities.

### *Hierarchical bivariate regression model*

A hierarchical bivariate regression model was constructed with social competence as the dependent variable. The model includes two independent variables (self-esteem and MVPA) that correlated statistically significantly with social competence.

The main objective of the present study is to examine the association between social competence and self-esteem, PA, screen time, and sports participation among adolescents. The hypothesis was partially confirmed, meaning that adolescents' social competence is related to self-esteem and PA (which was determined by the MVPA index). In contrast, social competence is not associated with screen time or participation in sports.

The association of social competence with self-esteem confirms the results of other studies in which correlational analyses showed that social competence was positively related to self-esteem [19,40,41]. The association of social competence with PA is confirmed by previous own research described in publication 1, which concerns the influence of PE lessons with elements of adventure education on the development of social competence of adolescents [42]. Similar reports have also been described in other intervention programs using PA, such as cooperative education [43].

Demonstrating the correlation of self-esteem and PA as predictors of social competence enables a better understanding of the nature of social competence, and thus supports the design of more effective interventions aimed at developing adolescents' social competence.

The study of adolescents' social competence and the analysis of its predictors are very important in the context of designing activities fostering the development of adolescents' social competence. Most pupils do not meet the recommendations for PA; [44]therefore, PE



classes are an important opportunity to undertake PA [45]and thus enable the pupils to improve their social skills and function effectively in life.

## **Conclusions**

### *Publications 1 and 2*

- 5) The introduction of a 5-month program of PE lessons with elements of adventure education leads to the improvement of pupils' functioning in terms of social competence necessary in situations requiring assertiveness and in situations involving social exposure. The program does not affect the competence exhibited in close interpersonal relationships. Participation in the program does not improve pupils' self-esteem, but it does have a positive effect on the stability of this trait.
- 6) The relationship between self-esteem and PA significantly explains the level of social competence. This finding supports the design of more effective interventions aimed at developing the social competence of youth.
- 7) PE lessons are a good possibility to enhance social skills and self-esteem through participation in physical activities, which is important, especially at times when the formation of both social skills and self-esteem are severely limited by the distance learning/quarantine/isolation conditions caused by the COVID-19 pandemic.
- 8) The presented research results provide evidence that PE classes with elements of adventure education influence the comprehensive development of pupils, improving their social skills necessary for interpersonal relations with peers and adults both in school settings and other areas of social life. PE teachers can improve pupils' social competence by creating and implementing specially designed programs with elements of adventure education.

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#### IV. ABSTRACT

**Purpose:** The purpose of this study was to analyze the impact of PE lessons with elements of adventure education on adolescents' social competence and self-esteem, and to analyze the relationship between social competence and self-esteem, PA, screen time, and participation in sports activities.

**Method and participants:**

The experiment involved 70 boys aged 15-16, out of whom 40 constituted the study group and 30 the control group. Questionnaires were used before the experiment (pre-test) and after the experiment (post-test). The resulting data were analyzed between terms and between groups (using ANOVA 2x2).

In addition, 106 pupils aged 15-16 (84 boys and 22 girls) were studied. Correlations between the following variables: social competence, PA, self-esteem, screen time, and participation in sports were examined.

**Results:** ANOVA ( $2 \times 2$ ) for the group interaction x time showed a statistically significant difference in social competence exhibited in social exposure situations and in competence requiring assertiveness. In addition, a moderately statistically significant relationship was shown between social competence and self-esteem. Adolescents with higher levels of PA (moderate to vigorous physical activities = MVPA)  $\geq 5$  days/week were also shown to have significantly higher levels of social competence than adolescents with lower levels of MVPA. A hierarchical bivariate regression model was built and an internal correlation was discovered between the independent variables: self-esteem and activity as measured by the MVPA index, which predicts the level of social competence of adolescents to a significant extent.

**Conclusions:** PE classes with elements of adventure education have a positive influence on the development of boys' social competence exhibited in social exposure situations and in situations requiring assertiveness. Introducing the assumptions of adventure education into the PE curriculum is an effective way to shape social competence through PA.

There is a statistically significant association of social competence with self-esteem and PA. There is a correlation between self-esteem and PA that is highly predictive of social competence levels. Findings from the study can support PE teachers and sports coaches who want to develop social competence in youth through participation in PA. Recommendations from the study may be particularly useful in planning school activities to offset the adverse effects of the Covid-19 pandemic in the area of social functioning of adolescents.

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Wydział Nauk o Kulturze Fizycznej  
Zakład Pedagogiki

### OŚWIADCZENIE

Niniejszym oświadczam, że mój wkład w powstanie przedstawionych poniżej publikacji polegał na pracy nad sformułowaniem koncepcji, opracowaniu metodologii, przeprowadzeniu badań i zgromadzeniu materiału badawczego oraz rejestracji danych, zapewnieniu powtarzalności pomiarów, sporządzeniu tabel z wynikami oraz przygotowaniu manuskryptu.

***The Impact of Physical Education Based on the Adventure Education Programme on Self-Esteem and Social Competences of Adolescent Boys.*** International Journal of Environmental Research and Public Health. 2021; 18(6):3021. <https://doi.org/10.3390/ijerph18063021>  
IF = 3.309, MNiSW = 140 pkt.

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Potwierdzenie współautorów:

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**Uchwała nr 467/19**

Ustawy z dnia 5 grudnia 1996 r. o zawodach lekarza i lekarza dentystry (t.j. Dz. U. z 2018 r., poz. 617 z późn. zm.); Rozporządzenia Ministra Zdrowia i Opieki Społecznej z dnia 11 maja 1999 r. w sprawie szczególnych zasad powoływania i finansowania oraz trybu działania komisji bioetycznych (Dz. U. z 1999 r., Nr 47, poz. 480); Ustawy z dnia 6 września 2001 r. Prawo farmaceutyczne (t.j. Dz. U. z 2017 r., poz. 2211 z późn. zm.); Rozporządzenia Ministra Finansów z dnia 30 kwietnia 2004 r. w sprawie obowiązkowego ubezpieczenia odpowiedzialności cywilnej badacza i sponsora (Dz. U. z 2004 Nr 101, poz. 1034 z późn. zm.); Rozporządzenia Ministra Finansów z dnia 18 maja 2005 r. zmieniającego rozporządzenie w sprawie obowiązkowego ubezpieczenia odpowiedzialności cywilnej badacza i sponsora (Dz. U. z 2005 r., Nr 101, poz. 845); Rozporządzenia Ministra Zdrowia z dnia 30 kwietnia 2004 r. w sprawie sposobu prowadzenia badań klinicznych z udziałem małoletnich (Dz. U. z 2004 r., Nr 104, poz. 1108); Rozporządzenia Ministra Zdrowia z dnia 30 kwietnia 2004 r. w sprawie zgłaszania niespodziewanego ciężkiego niepożądanego działania produktu leczniczego (Dz. U. z 2004 r., Nr 104, poz. 1107); Rozporządzenia Ministra Zdrowia z dnia 17 lutego 2016 r. w sprawie wzorów wniosków związanych z badaniem klinicznym wyrobu medycznego lub aktywnego wyrobu medycznego do implantacji oraz wysokości opłat za złożenie tych wniosków (Dz. U. z 2016 r., poz. 208); Ustawy z dnia 20 maja 2010 r. o wyrobach medycznych (t.j. Dz. U. z 2017 r., poz. 211, z późn. zm.); Rozporządzenie Ministra Finansów z dnia 6 października 2010 r. w sprawie obowiązkowego ubezpieczenia odpowiedzialności cywilnej sponsora i badacza klinicznego w związku z prowadzeniem badania klinicznego wyrobów (Dz. U. z 2010 r., Nr 194, poz. 1290); Ustawy z dnia 18 marca 2011 r. o Urzędzie Rejestracji Produktów Leczniczych, Wyrobów Medycznych i Produktów Biobójczych (t.j. Dz. U. z 2016 r., poz. 1718 z późn. zm.); Rozporządzenia Ministra Zdrowia z dnia 2 maja 2012 r. w sprawie Dobrej Praktyki Klinicznej (Dz. U. z 2012 r., poz. 489); Rozporządzenia Ministra Zdrowia z dnia 12 października 2018 r. w sprawie wzorów dokumentów przedkładanych w związku z badaniem klinicznym produktu leczniczego oraz opłat za złożenie wniosku o rozpoczęcie badania klinicznego (Dz. U. z 2018 r., poz. 1994); w oparciu o Deklarację Helsińską - Zasady Etycznego Postępowania w Eksperymentach Medycznych z Udziałem Ludzi oraz przepisy ICH GCP.

**Komisja Bioetyczna, na posiedzeniu w dniu 11 kwietnia 2019 r.**

**rozpatrzyła wniosek dotyczący prowadzenia badań naukowych.**

**Kierownik projektu: prof. AWF dr hab. Agata Wiza**

**Miejsce prowadzenia badań:  
Akademia Wychowania Fizycznego w Poznaniu**

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**Członkowie zespołu**

**badawczego: mgr Agnieszka Koszałka-Silska  
prof. AWF dr hab. Agata Wiza  
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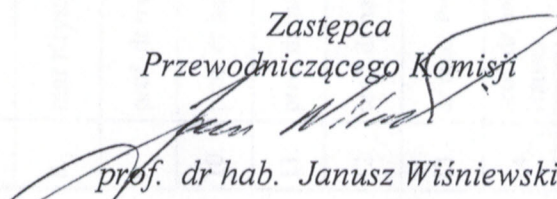
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**„Wpływ Pedagogiki Przeżyć realizowanej podczas zajęć wychowania fizycznego na rozwój kompetencji społeczno-emocjonalnych uczniów szkół ponadpodstawowych”.**

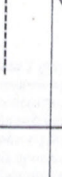

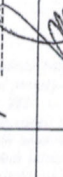


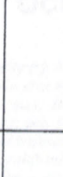

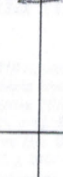
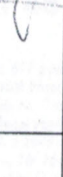
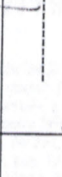


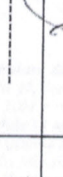
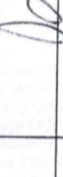
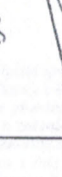
**Okres prowadzenia badań: kwiecień 2019 r. – marzec 2020 r.**

**Komisja wydała uchwałę o pozytywnym zaopiniowaniu tego wniosku**

Zastępca  
Przewodniczącego Komisji

  
prof. dr hab. Janusz Wiśniewski

Podpisy członków Komisji Bioetycznej podejmujących Uchwałę nr 467/19 z dnia 11.04.2019r.

Lp.	Imię i Nazwisko	Specjalność	Miejsce Pracy	Podpis
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4.	dr Krystyna Babiak	prawnik	Kancelaria Radcy Prawnego, dr Krystyna Babiak, ul. Czartoria 1/2, 61-102 Poznań.	
5.	ks. prof. UAM dr hab. Andrzej Bohdanowicz	teologia	Wydział Teologiczny Uniwersytetu Adama Mickiewicza w Poznaniu, ul. Wieżowa 2/4, Poznań	
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14.	prof. dr hab. Joanna Twarowska- Hauser	psychiatria	Klinika Psychiatrii Dorosłych, Zakład Genetyki w Psychiatrii UMP, ul. Rokietnicka 8, 60-806 Poznań.	
15.	prof. dr hab. Henryk Wysocki	choroby wewnętrzne, kardiologia	Wyższa Szkoła Pedagogiki i Administracji im. Mieszka I w Poznaniu, ul. Bułgarska 55, 60-320 Poznań.	



Article

# The Impact of Physical Education Based on the Adventure Education Programme on Self-Esteem and Social Competences of Adolescent Boys

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**Abstract:** The objective of this study is to analyse the impact of physical education based on the adventure education programme on the social competences of adolescent boys. The participants ( $n = 70$ ) were 1st grade high school students between 15 and 16 years old. Adolescents' social competences were measured using the Rosenberg's Self-Esteem Scale (RSES) and Social Competence Questionnaire (SCQ) before and after the intervention. An experimental repeated-measures design was used, with a comparison group. ANOVA ( $2 \times 2$ ) for interaction group  $\times$  time showed statistical significance in competences revealed in situations of social exposure ( $F_{1,68} = 5.16, p < 0.05$ , partial  $\eta^2 = 0.07$ ) and competences revealed in situations requiring assertiveness ( $F_{1,68} = 4.73, p < 0.05$ , partial  $\eta^2 = 0.07$ ). Using the adventure education (AE) programme may be recommended as a way of developing social skill competences revealed in situations of social exposure and competences revealed in situations requiring the assertiveness of adolescents through physical activity that can be easily integrated into the school environment.

**Keywords:** social competences; self-esteem; physical education; physical activity; school-based intervention; adolescents; adventure education



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## 1. Introduction

Researchers broadly agree that there is a need to develop young people's social competences and that their positive self-esteem plays a very important factor in their lives [1–3]. This assumption implies the need to create conditions which will facilitate the development of social competences and self-esteem in institutional teaching and education. Both social competences and self-esteem are perceived as factors that determine one's mental health, as well as positive functioning during adolescence [2,4–6] p. 7. In this context, a short transition period, such as attending a high school, is of great importance [7]. Adolescence is the time when one's self-esteem, well-being, and perception of success change dynamically [8]. Researchers point to the relationship between deficiencies in developing social skills in childhood and adolescence and difficulties when reaching adulthood and having to adopt new social, family, and professional roles [9] pp. 249–251. Social skills can also be the criterion for assessing one's labour market opportunities as labour stocks and potential candidates, while their deficiency can lead to the marginalisation of individuals or social exclusion [2,10]. Social competences in the scientific literature and guidelines regarding work in education and care are considered the key objectives of education in the 21st century [3]. They are perceived as an individual's resources, which significantly determine the satisfaction derived from different spheres of life, such as health, work, or interpersonal relationships [11].

Social competences necessary in adult life and professional work develop significantly during early and late adolescence [9] p. 250; consequently, school seems to be the most

appropriate place for activities aimed at acquiring social competences and positive self-esteem.

Matczak [6] p. 7 defines social competences as complex skills that determine one's efficiency when dealing with particular types of social settings, acquired by an individual in the course of social training. They can be developed intentionally through participation in training, whose effectiveness depends on social and emotional intelligence, temperament and personality traits, the impact of the environment on the individual, the intentional and unintentional influences of the teachers and counsellors, training and therapeutic influences [6].

The students with low levels of social competences are more likely to be rejected by their peers, which can cause reduced interpersonal contacts as well as a lack of opportunities for developing these competences [12,13], and consequently, also lower self-esteem [14,15]. Many studies have noted that adolescents with low self-esteem prefer solitude, which is probably because of the social and emotional disorders in their development [15–18]. People with higher self-esteem are braver when establishing new relationships and are more willing to do so when compared to individuals with lower levels of this trait [12]. The level of self-esteem is defined as the result of one's real social acceptance or real social exclusion or rejection [5]. Adolescents with low self-esteem are not easily accepted by their classmates in school, and they are more likely to be separated from their peers and spend more time alone [19,20]. The efficiency of functioning in different social situations is associated with self-esteem [5].

Adolescents' self-esteem is related to social functioning [15,21,22]. When developing the self-assessment tool for measuring one's self-esteem, Rosenberg defined it as "a positive or negative attitude toward self, a type of global self-assessment. A higher level of self-esteem means the belief that the individual is good enough and worthy. Analogically, lower self-esteem means dissatisfaction with one's self and rejecting it" [23] pp. 30–31. Self-esteem is an important part of an individual's self-concept and is considered important for positive mental health and functioning during adolescence [4,7]. Some mental health problems (including depression, anxiety, and behavioural problems that tend to be associated with them) occur in people with low self-esteem [4,5,7]. Self-esteem is interesting both as a factor related to symptoms of depression and as an important resource for mental well-being during adolescence [4,7]. Individuals with high self-esteem may also be more likely to identify and use different personal and contextual coping resources (e.g., seek and receive more social support), which may, in turn, facilitate positive coping behaviours and adjustment, and promote well-being [4].

Self-esteem levels also seem to be related to various health behaviours, such as doing sports, physical activity levels, eating disorders, or addiction tendencies [24–28]. According to Lee, Beak, and Nicholson [24], a greater level of self-esteem significantly decreases the drinking behaviour of young people. Nemček, Kraček, and Peráčková [25] analysed differences in the self-esteem levels of elite and competitive athletes, recreational athletes, and inactive individuals, and found that physically active groups had significantly higher self-esteem. Russo et al. found that physical activity (PA) affects self-esteem, and specifically showed that adolescents with higher fitness skills have higher self-esteem compared to people in poorer physical shape [26]. Self-esteem is integral to an adolescent's sense of their own value, a principal component of mental health, a powerful indicator of a healthy lifestyle, and an important indicator of well-being. Self-esteem is a major factor influencing adolescent lives [29].

Both the social skills of young people and their self-esteem are an important part of personal development and can also be developed through PA. Furthermore, social competence is frequently recognised as a curricular goal in several programmes and subjects, such as physical education (PE) [3,28]. Evidence suggests that young people can develop social skills through participation in PA [30]. Hardman et al. [31] noted that personal and social development constitutes one of the main and most frequently cited goals of European PE programmes [31]. The Polish PE curriculum includes goals for

developing the social and personal competences of students at both primary and high schools [32]. Therefore, both researchers and practitioners are increasingly interested in the role of PE in preparing young people for their everyday life [33] p. 116.

The development of social competences through PA is closely related to Adventure Education (AE) [34]. Asensio-Ramon et al. [35] emphasize that AE promotes the development of learning resources for life in adult society. Priest and Gass [36] p. 29 defined AE as “a branch of outdoor education concerned primarily with interpersonal and intrapersonal relationships. It uses adventurous activities that provide a group or an individual with compelling tasks to accomplish. These tasks often involve group problem solving (requiring decision-making, judgment, cooperation, communication, and trust) and personal challenge (testing competence against mental, social, or physical risks)” [36] p. 29. To maximize safety, professionals structure risk in a method that causes people to perceive it as enormously high, thus it is much lower and more acceptable as a medium for driving development and change. By responding to apparently insurmountable tasks, people often learn to overcome their self-imposed perceptions of their capabilities to succeed. They turn limitations into abilities, and therefore they learn a great deal about themselves and how they relate to others [31] p. 29. AE develops many different skills. The most well-known meta-analysis of research on AE identified the growth of competence in the following six categories: leadership, self-concept, academic, personality, interpersonal relationships, being adventurous [37]. There is robust research evidence on the positive effects of AE on social competences [35,37,38] pp. 158–161. The well-documented effectiveness of AE has led many countries to introduce outdoor and AE into their national PE curricula [34,39].

In Poland, the concept of AE is still relatively new. However, several researchers appreciated the potential of experimental pedagogy lessons and recommended including them in school subjects, especially in classes of PE [40,41].

This study developed, applied, and evaluated an AE programme to improve students' social skills as well as their self-esteem. The programme was prepared following the core principles of AE and pursued the objectives of the PE curriculum at the specific educational stage. The study examined whether an AE programme would benefit the students' social skills or their self-esteem. The intervention was introduced to classes where girls and boys learn together; however, only the boys' results were considered. Gender differentiates the level of social competences [6] pp. 50–51 and self-esteem [5,7,37] of adolescents; therefore, the boys' results were separated and analysed. Furthermore, it was not possible to analyse the girls' results because this group was too small to perform statistical analyses (only five girls in the experimental group).

## 2. Materials and Methods

### 2.1. Participants

The study group comprises 70 boys aged between 15 and 16 years old (mean = 15.8 ± 0.4), who were students of the first classes of a technical high school in Poznan (a five-year post-primary school whose aim is to prepare its students to begin professional work and/or continue education). Four classes were included in the study, two of which were in the experimental group and the other two in the control group. The experimental group consists of 40 boys and the control group comprises 30 boys. Only the students whose parents gave written consent to their children's participation in the study took part in the AE programme. Consent was also obtained for publishing the research results. The full description and purpose of the research were presented to parents and adolescents. Participants took part voluntarily and signed informed consent forms. Only a complete set of data was used for the statistical analyses. The questionnaires were completed in whole-class groups during one PE class in quiet conditions and took approximately 40 min to complete. The general characteristics of the participants at the pre-test are found in Table 1.

**Table 1.** General characteristics of the participants (n = 70).

Variables	Experimental Group n = 40	Control Group n = 30
Age (years $\pm$ SD)	15.8 $\pm$ 0.4	15.7 $\pm$ 0.5
Family structure [% (n)]		
mother	98% (39)	100% (30)
father	85% (34)	90% (27)
an orphanage or foster family/other people	0% (0)	0% (0)
Perceived family wealth [% (n)]		
wealthy	0% (0)	10% (3)
rather wealthy	35% (14)	40% (12)
average	60% (24)	50% (15)
rather poor	5% (2)	0% (0)
poor	0% (0)	0% (0)
Parental education		
Mother's education [% (n)]		
primary education	1% (3)	1% (3)
high education	12% (30)	6% (20)
tertiary education	27% (68)	23% (77)
Father's education [% (n)]		
primary education	1% (3)	0% (0)
high education	16% (40)	11% (37)
tertiary education	23% (58)	19% (63)
MVPA (min/day) [M $\pm$ SD]	3.4 $\pm$ 1.4	4.2 $\pm$ 1.6

Note: M = mean, SD = standard deviation, MVPA = moderate and vigorous physical activity.

In the total sample of 70 students, the moderate and vigorous physical activity (MVPA) indicator averaged  $M = 3.7 \pm 0.4$ . The results obtained in both the experimental group  $M = 3.4 \pm 1.4$  and the control group  $M = 4.2 \pm 1.6$  are below the recommended MVPA level of adolescents [42].

In the analysis of the family structure, it was shown that none of the participants lived in an orphanage or foster family. Most students from the total sample of  $n = 70$  assessed the wealth of their family as average (39 people), 26 students assessed their family as rather wealthy, 3 people assessed their families as wealthy, and 2 people assessed their families as rather poor. No one judged his family as poor. The vast majority of students in the total group indicated their mother's higher education (50 people). Eighteen people out of 70 indicated their mother's secondary education, and 2 people indicated primary education. Father's higher education was indicated by 42 students. Twenty-seven people indicated that their father has secondary education and only 1 adolescent indicated primary education.

## 2.2. Procedure and Structure of Intervention Programme

The experimental group took part in an intervention programme during PE classes. They completed a specially designed AE programme aimed at developing the students' social competences. The control group took part in PE classes carried out in concordance with the existing curriculum prepared by the PE teaching staff/with the school's adopted PE curriculum.

The AE programme was carried out during the classes of PE and lasted 12 weeks. The time of the intervention was selected based on recommendations from research on AE-based interventions that develop youth social competences [38]. Research from these studies recommended shortening the intervention programmes below 20 weeks to maintain a high level of motivation of participants [38]. Furthermore, the intervention was limited to 12 weeks because it had to fit into a school phase, which was not interrupted by winter break to control confounding effects of the holiday activities. The study was conducted in the first semester of the school year 2019/2020. The intervention programme was held once a week during two joined teaching units ( $2 \times 45$  min). It has been designed to fulfil the objectives

of the PE curriculum at the fourth educational stage, with particular emphasis on the social competence of the students. The focus of the intervention was on improving the students' assertiveness, social exposure, and the skills necessary for effective behaviours in close interpersonal relationships and increasing the students' self-esteem. The innovative nature of the intervention programme comprised conducting the classes under the principles of AE and introducing during the classes of PE the elements characteristic of AE, such as actions and interactions, reflection, and transfer, all of which enable learning through real, first-hand experience. The intervention programme was based on the assumption that developing social competences can occur in social training [6] p. 7; therefore, the classes were purely practical and grounded on a variety of different physical activities. Depending on the weather conditions, the classes were held on the school field, the school gym, or a classroom. The overview of the programme has been added in the Supplementary Material as Table S1. In the Supplementary Material, it is shown how adventure education is related to the tasks based on it, their structure/course and particular objectives. The course always consisted of three basic stages:

1. A warm-up in the form of a dynamic game.
2. The main part containing problem-solving tasks that need collaboration, group actions and interactions, and trust games.
3. Reflection and transfer in the form of the students' presentation of their conclusions, drawn from their experience and with various forms of expression, such as speaking in front of other students, writing the conclusions on pieces of paper, writing letters to one another, expressing publicly the wishes and expectations for each other as well as the whole group, or summarising the classes in one, most relevant word.

### 2.3. Ethics

The study was conducted under the Declaration of Helsinki, and the protocol was approved by the Local Bioethics Committee of the Medical University of Karol Marcinkowski in Poznan (decision no. 467/19). For the students' convenience, the information about the anonymous and voluntary nature of their participation was read out before completing the questionnaire, that the study records would be kept confidential, and that their individual contributions would be unidentifiable in the final report. Written consent was collected from the parents.

### 2.4. Instruments

#### 2.4.1. Rosenberg's Self-Esteem Scale (RSES)

Self-esteem was measured using the Polish version of the Rosenberg's Self-Esteem Scale [5]. The scale is a one-dimensional tool that allows the assessment of the level of global self-esteem. The scale consists of 10 items scaled on a four-point response structure (1 = strongly disagree to 4 = strongly agree). The range of possible results is from 10 to 40 points. To assess whether the score obtained is low or high, reference should be made to the sten norms [43] p. 63.

When scoring on this scale, the following interpretation of the results was adopted: marks 1–3 are low scores, marks 4–7 are average scores, and marks 8–10 are high scores. Five items are positively worded and five items are negatively worded to inhibit response bias, that is, an individual's tendency to agree with statements regardless of their content. A sample item is: "On the whole, I am satisfied with myself". In the way the answers are assessed, the positive statements are reversed: 1,2,4,6,7 so that a higher point value is awarded for answers expressing a higher self-esteem level. The Rosenberg scale has been widely used for evaluating the self-esteem of young people, and its reliability and validity are well documented. The Polish version of the scale is a reliable tool, Alpha Cronbach = 0.81–0.83, with confirmed theoretical validity [5]. Alpha Cronbach calculated on the present whole sample in pre-test was 0.89 (in post-test it was 0.92).

#### 2.4.2. Social Competence Questionnaire Version for Adolescents (SCQ)

The study used a Polish questionnaire designed to study the social competences of adolescents [6]. The Social Competence Questionnaire (SCQ) is used to evaluate social competences understood as acquired skills that condition the effectiveness of human functioning in various social situations. Besides the general index, the questionnaire also provides three detailed indicators that determine the level of competences revealed in situations of social exposure (SCQ E), situations requiring assertiveness (SCQ A), and situations of close interpersonal contact (SCQ I). The SCQ for Adolescents consists of 3 scales, with each scale reaching a different score range. The SCQ I scale contains 15 items, and the scoring range is from 15 to 60. The SCQ E scale includes 18 items, and the scoring range is from 18 to 72. The SCQ A scale includes 17 items, and the score range is from 17 to 68. The respondent assesses the efficiency with which he performs them on a four-point scale described by adjectives: definitely good, not bad, rather poor, definitely bad. Raw scores (points) are assessed by relating them to the sten norms. The following categorisation is used in the evaluation of the standard scores: stens 1–3 are low scores, stens 4–7 are average scores, and stens 8–10 are high scores [6] pp. 61–62. The reliability of the SCQ measured by the concordance (Alpha Cronbach) is 0.93–0.95 [6] p. 5. Alpha Cronbach calculated on the present whole sample for the whole scale and each subscale in the pre-test was 0.81–0.95 (in post-test it was 0.85–0.96).

#### 2.4.3. The Health Behaviour in School Aged Children (HBSC)

Only selected questions were used from the Health Behaviour in School Aged Children (HBSC) Questionnaire to investigate levels of PA and chosen socioeconomic data. PA level was determined based on the MVPA index [44]. This measure corresponds to the average number of days per week with at least 60 min spent undertaking various forms of PA during which, in the participants' subjective opinion, their heart rate increased, and they experienced a feeling of shortness of breath (higher breathing frequency). This question was adapted by HBSC from a screening test by Prochaska et al. [44] Participants were asked to answer two questions: P1: Over the past 7 days, on how many days were you physically active for a total of at least 60 min per day? P2: Over a typical or usual week, on how many days are you physically active for a total of at least 60 min per day? The MVPA index was calculated based on the following formula:  $MVPA = (P1 + P2)/2$  where: MVPA = PA index; P1 = number of physically active days during the past 7 days; P2 = number of physically active days during a typical week.

Furthermore, there were some questions about the adolescent's age, family structure, family wealth, and parents' education [45]. The above information was used during the study to get to know the participants better and describe them.

#### 2.5. Data Collection and Analysis

A two-group experimental and control pre- and post-test design was adopted. All testing was completed anonymously using a code designed to match students' responses at pre- and post-intervention without revealing the student's identity.

The questionnaires used for statistical analysis were taken from the boys who were present at both tests' dates: during the pre-test (conducted immediately before the beginning of the programme) and the post-test (carried out directly after the programme ended). Of the 85 participants at the pre-test, 70 completed the post-test evaluation, giving an attrition rate of 18% (=15 of 85). There was data loss due to the sickness of the participants. The response set for students was 82%.

#### 2.6. Statistical Analysis

All analyses in Statistica version 13.0 (StatSoft Polska Sp. z o.o. 2020). Descriptive quantitative data are presented as mean and standard deviation ( $M \pm SD$ ). The normality of each variable was tested using the Shapiro–Wilk method. Qualitative variables are presented by percentage and count (% , n). In order to examine changes between the groups



(experimental, control) and time (pre-test, post-test) and their changes with variables depending on self-esteem (RSES) and social competences (SCQ I, SCQ A, SCQ E) four separate two-way repeated measures analyses of variance ANOVA ( $2 \times 2$ ) have been conducted. F-factors (F), indexed degrees of freedom,  $p$  ( $p$ ) value, and effect sizes (partial  $\eta^2$ ) were reported for each ANOVA.

A sign test was used to examine changes between terms (pre-test, post-test) for the variables self-esteem and social competences included as a score calculated based on a standard sten scale. The sign test is a nonparametric alternative to the two-sample independent t test. The tested variables (self-esteem and social competences) converted to standardized sten scores are of continuous distribution meeting the test's assumptions. The sign test involves calculating a number that indicates how many times the pre-test value is higher than the post-test variable value. Cohen's  $d$  ( $d$ ) effect size was reported for significant difference. Cohen's  $d$ -value of less than 0.2 was negligible, between 0.2 and 0.49 was small, between 0.50 and 0.8 was an admission, greater than 0.8 was a drop. The level of statistical significance was 0.05 for all statistical procedures.

### 3. Results

A separate two-way ANOVA with repeated measures (group  $\times$  time) for RSES showed that there was no statistically significant main effect for group ( $F_{1,68} = 2.27, p = 0.1362$ , partial  $\eta^2 = 0.03$ ) and for time ( $F_{1,68} = 0.52, p = 0.4754$ , partial  $\eta^2 = 0.01$ ) between pre-test mean values of  $28.0 \pm 5.81$  and post-test mean values of  $28.3 \pm 6.6$ . There was no statistically significant interaction between time and group ( $F_{1,68} = 0.08, p = 0.7749$ , partial  $\eta^2 < 0.01$ ). This was confirmed by RSES analysis according to the sten scale score, which showed no statistically significant change in either the study ( $p = 0.999$ ) or control group ( $p = 0.289$ ). This is presented in Table 2.

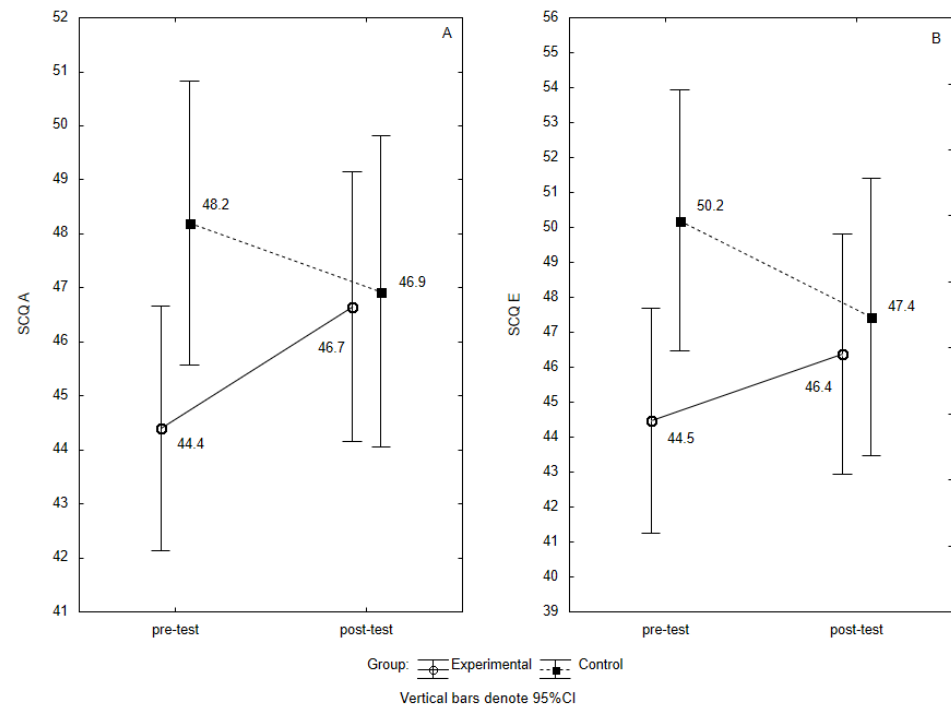
**Table 2.** Descriptive statistics of the self-esteem and social competences in experimental and control groups pre- and post-intervention programme.

Variab.	Group	Pre-Test				Post-Test			
		M $\pm$ SD	Evaluation Result <sup>b</sup>			M $\pm$ SD	Evaluation Result		
			Low	Mid	High		Low	Mid	High
RSES	Experimental	27.0 $\pm$ 6.2	38% (15)	40% (16)	22% (9)	27.2 $\pm$ 7.1	40% (16)	30% (12)	30% (12)
	Control	29.0 $\pm$ 5.2	23% (7)	47% (14)	30% (9)	29.4 $\pm$ 5.9	23% (7)	33% (10)	44% (13)
SCQ I	Experimental	39.5 $\pm$ 6.4	18% (7)	70% (28)	12% (5)	40.0 $\pm$ 8.1	25% (10)	63% (25)	12% (5)
	Control	42.3 $\pm$ 7.3	17% (5)	50% (15)	33% (10)	42.7 $\pm$ 6.1	10% (3)	70% (21)	20% (6)
SCQ A	Experimental	44.4 $\pm$ 7.5 <sup>a</sup>	38% (15)	60% (24)	2% (1)	46.7 $\pm$ 8.9	28% (11)	62% (25)	10% (4)
	Control	48.2 $\pm$ 6.7	17% (5)	80% (24)	3% (1)	46.9 $\pm$ 6.3	13% (4)	87% (26)	0% (0)
SCQ E	Experimental	44.5 $\pm$ 9.5	40% (16)	53% (21)	7% (3)	46.4 $\pm$ 11.2	25% (10)	60% (24)	15% (6)
	Control	50.2 $\pm$ 11.2	23% (7)	57% (17)	20% (6)	47.4 $\pm$ 10.6	17% (5)	66% (20)	17% (5)

Variab.—variables, RSES—Rosenberg Self-Esteem Scale, SCQ I—Social Competence Questionnaire, scale I—competences revealed in situations of close interpersonal contact, SCQ A—Social Competence Questionnaire, scale A—competences revealed in situations requiring assertiveness, SCQ E—Social Competence Questionnaire, scale E—competences revealed in situations of social exposure, M = mean, SD = standard deviation; Low, Mid, High—levels of self-esteem or/and social competences; <sup>a</sup> significant differences between pre-test and post-test  $p < 0.05$ ; <sup>b</sup> significant differences between pre-test and post-test in experimental group for variables SCQ A and SCQ E  $p < 0.05$ .

A separate two-way ANOVA with repeated measures (group  $\times$  time) for SCQ I showed that there was no statistically significant main effect for group ( $F_{1,68} = 3.11, p = 0.0824$ , partial  $\eta^2 = 0.04$ ) and for time ( $F_{1,68} = 0.50, p = 0.4820$ , partial  $\eta^2 = 0.01$ ). There was no statistically significant interaction between time and group ( $F_{1,68} = 0.001, p = 0.9806$ , partial  $\eta^2 < 0.01$ ). For SCQ A, it showed that there was no statistically significant main effect for group ( $F_{1,58} = 1.55, p = 0.2170$ , partial  $\eta^2 = 0.02$ ) and time ( $F_{1,68} = 0.37, p = 0.5450$ , partial  $\eta^2 = 0.01$ ). In contrast, the interaction time  $\times$  group showed a statistically significant difference ( $F_{1,68} = 4.73, p = 0.0331$ , partial  $\eta^2 = 0.07$ ). This statistical variation was driven by a statistically significant increase in competences revealed in situations requiring

assertiveness in the small effect size study group (post hoc:  $p = 0.0371$ ,  $d = 0.30$ . This is presented in Figure 1A).



**Figure 1.** (A,B) Distribution of the SCQ A and SCQ E scale scores for the Experimental and Control groups at pre-test and post-test. The mean value for 95% confidence interval. SCQ A and SCQ E scale scores for the Experimental and Control groups at pre-test and post-test. Note: CI—confidence intervals, SCQ A—mean scores of Social Competence Questionnaire, scale A—competences revealed in situations requiring assertiveness, SCQ E—mean scores of Social Competence Questionnaire, scale E—competences revealed in situations of social exposure.

This was confirmed by the SCQ A analysis according to the sten scale assessment, which showed an increase in competences revealed in situations requiring assertiveness ( $p = 0.0455$ ). In contrast, the control group in the pre-test and post-test was not statistically significantly different ( $p = 0.3035$ ). This is presented in Table 2. For SCQ E, there was no statistically significant main effect for group ( $F_{1,68} = 2.10$ ,  $p = 0.1518$ , partial  $\eta^2 = 0.03$ ) and time ( $F_{1,68} = 0.18$ ,  $p = 0.6746$ , partial  $\eta^2 < 0.01$ ). However, the interaction time  $\times$  group showed a statistically significant difference ( $F_{1,68} = 5.155$ ,  $p = 0.026$ , partial  $\eta^2 = 0.07$ ). This is presented in Figure 1B. The analysis of the SCQ E by sten scale scores showed an increase in competences revealed in situations of social exposure in the study group ( $p = 0.0159$ ). The control group in pre-test and post-test did not differ statistically significantly ( $p = 0.9999$ ). This is presented in Table 2.

#### 4. Discussion

The purpose of the study was to evaluate the effectiveness of the AE-based programme introduced during PE classes in a high school, based on the changes in the level of social competences among boys aged 15–16. In the present study, it was hypothesized that participation in the AE programme develops some of the boys' social skills. The first of the study's hypotheses was partly confirmed: AE-based exercise during PE classes influenced the development of social competences related to behaviour in a situation requiring assertiveness and social competences related to behaviour in a situation of social exposure.

There has been an increase in the boys' competences responsible for effective behaviour in situations of social exposure and situations requiring assertiveness. The competences

that are responsible for effective behaviour in situations of close interpersonal contact have not changed, which can be due to several factors, including the stage of development of the group [46]. The classes that participated in the programme were newly formed groups, whose willingness to work on the skills beneficial for creating close interpersonal relationships was scarce. The newly formed group of participants who did not know each other beforehand needed more tasks integrating them and bridging the social distance, rather than assignments focused on developing skills responsible for the ability to enter close interpersonal contact, such as confiding in one another or listening to other people's confessions. Probably due to this low degree of familiarity, the participants of the programme did not report an increase in the skills required to behave effectively in situations of close interpersonal contact. Based on a meta-analysis of the ways of achieving the assumed results of the adventure education, developed by McKenzie, several features have been cited that influence the final results [46]. It should be emphasised that the outcomes of the programme are independent of processing, which means "sorting and ordering of information" that enables the participants to internalise the meaning of the adventure education experience. The researchers also emphasise the meaning of the participants' individual traits and personalities, and suggest that one's personality does in fact, to some degree, determine the extent of changes that they experience during the programme [46]. An important factor in achieving the results of the programme is the size of the group. Particularly effective learning takes place in groups of 7–15 people, while a school class consists of 26 students. The inter-participant bond that binds the group affects the results of the programme [46], and in the newly formed class, the bonds between the participants were just beginning to form. Conrad and Hedin found that developing personal relationships with the other participants influenced both one's personal and social development [47].

The second study hypothesis that participation in PE based on the AE programme increases the boys' self-esteem was not confirmed. The study hypothesized an increase in self-esteem in students after the intervention. Nonetheless, there were no statistically significant changes in the boys' self-esteem. Similar results were reported in an experiment examining the effectiveness of adventure education programmes as students' expeditions into the wilderness [48]. The results of this experiment showed that the level of self-esteem in boys aged 11–18 years before and after the expedition was similar [48]. It should be noted, however, that the intervention differed significantly from the one in the present study. The mountain expedition was originally organised outside the school grounds, and only during a certain time. It lasted several days and was a onetime-only event of high intensity. It was not implemented in the weekly school activities, which were held following the school's timetables and conditions. Another study of the participants' self-esteem, conducted with a pre-test and a post-test, is the study on the stability of the students' self-esteem during the school year [7]. It demonstrates that the self-esteem of Norwegian boys at the age of 15–21 did not change during the school year [7]. The results obtained may reinforce the theoretical perspective, according to which one's self-esteem is perceived as a relatively constant trait [5].

Self-esteem is an important part of the self-concept of an individual [4]. Hattie et al. conducted the study measuring the programme's effect size and follow-up effect size. Of the six outcomes studied in this manner, self-concept had the least significant programme effect size, while its follow-up effect size was the most significant one [37]. This might indicate a "sleeper" effect, whereby self-concept changes are seeded during the programme and continue to grow afterwards [49].

The precisely described circumstances in which the classes took place (their duration, whereabouts, the available equipment, and the school infrastructure) determined the type of activities. The programme was based on trust games, interactions, and tasks involving communication, teamwork, and problem-solving. However, it offered no more complex activities/bigger challenges characteristic of adventure education, such as high rope activities, rock climbing, or canoeing, whose common goal is to arouse in the participants a variety of important and difficult emotions, such as fear, uncertainty, and a sense of

danger [46]. Dealing with these emotions and seemingly impossible challenges allows the participants to feel much more satisfied with themselves and to prove their self-worth, and consequently increase their self-esteem. Due to the need to adapt the programme to the school infrastructure, the programme offered too few intense emotional experiences to significantly affect the participants' self-esteem.

The phenomenon of a participant noticing there has been a change in their behaviour is also of great importance. It is up to the individual to realise the degree to which their own perception/image of themselves has altered. The age, gender, background, and expectations of the participants may influence the outcomes they experience as a result of an adventure education programme [37,47].

The positive effects of the development of social competences through participation in adventure education programmes are well documented [33,35,36,39]. However, in the Polish educational and cultural context, regular classes of PE that include AE are innovative research.

This study complements the current literature by analysing the impact of the AE programme on students' social competences. Social skills have been selected and identified as learning objectives, and PE lessons based on the AE programme are designed to achieve these objectives. The hypothesis has been put forward that PE based on the AE programme, compared to a traditional PE programme, will improve social skills, revealing effective behaviour in situations of social exposure and situations requiring assertiveness.

The research presented has been developed on the assumption that social skills are the goal of the PE programme and they can be achieved by including AE. These findings provide evidence that developing social skills can be an attainable goal in PE. PE teachers and youth sports coaches can improve students' social skills by creating and implementing specially designed programmes using AE. However, it is worth noting that in the future the AE programme should be enriched with additional activities that would arouse more intense experiences among participants, and that the forms of activity should be adjusted to the individual developmental needs of students. In addition, increasing the number of classes under the programme could affect the development of other social skills of boys. However, the number of PE classes based on AE should be carefully balanced with the number of activities with a high level of physical activity (e.g., football, basketball, running). PE lessons should be strongly diversified in terms of the goals pursued and the methodology of conducting classes subordinated to them. In the presented study, the focus was on the greatest adaptation of AE classes to school conditions (duration of lessons, school infrastructure, and available teaching and sports aids), but the programme would be more if the activities were held outside the school and the school playground (in forests, lakes, parks, etc.), enabling students to have direct contact with nature and thus providing additional benefits [48].

The limitation of the study is the lack of the second post-test to check the level of the social competence and self-esteem of students in the long term. The second post-test would determine whether students have retained their acquired skills and whether their level has increased over time. As reported by Neill and Richards, the effects of AE programmes seem not only to be sustained over time but also to increase further, which is impressive [49]. The second post-test was scheduled 5 months after the end of the programme and was to take place before the end of the school year, in June 2020. Unfortunately, the planned measures were not implemented because of the coronavirus pandemic. In March 2020 (one month after the programme), a pandemic appeared in Poland and a lockdown was introduced, so students started to participate in remote teaching while still being isolated at home. It seems to be inadmissible to re-examine both self-esteem and social competences in a pandemic. Investigating the level of social competence and self-esteem in conditions of still recommended home isolation, remote learning, and permanent fear of contact with a potential COVID-19 infection would be valuable but could not be seen as a continuation of measuring the sustainability of the effects of participating in PE based on the AE programme.

The current pandemic situation associated with home isolation has a negative impact on psychological and social changes, thus exposing children to significant risks to their well-being [34]. The tested AE programme can become particularly useful for educators after the pandemic as an intervention to support the rebuilding of interpersonal relationships and to resume the process of shaping social competencies during direct social training, which has been limited or is impossible to perform.

The data were collected at one high school in Poznan. Results can thus not be generalised to the whole Polish adolescent population.

Undoubtedly, the strength of the research is implementing the recommendations of researchers analysing the effectiveness of programmes developing the social competences of young people. The researchers emphasize the need to improve the methodology used to evaluate programmes that promote competencies in adolescents [50,51]. Therefore, methodological rigor was guaranteed in the evaluation of the programme's effectiveness. Measurement instruments with demonstrated reliability and validity were used, and a control group was included, with pre-test and post-test measures in both groups.

A great advantage of the research is also implementing the recommendations of McKenzie [46]. She stressed the need to verify the benefits of participating in AE programmes not organised in the wilderness only. She recommends a study of the outcomes of programmes implemented in familiar environments, such as the classroom or workplace [46]. The present research is based on ten demands and has been carried out in an environment known to teenagers, i.e., in their school during their daily lessons according to the timetable.

Since adolescents spend most of their time at school, implementing a social competence development programme in the school curriculum can be an effective way of promoting personal and social development as a foundation for teenage well-being.

PE based on AE pursues the aims and objectives of the core curriculum for teaching PE at a given educational stage; therefore, it can provide methodical support for PE teachers and other pedagogues or sports trainers. Institutions that may be interested in the results of the research are schools (especially technical and vocational, as they prepare individuals for their own entry into the labour market), youth care facilities with deficits in social competences, or facilities running rehabilitation groups. These organisations should aim to provide conditions for young people to develop emotionally, socially, and mentally.

Regarding the limitations of the study, the sample size was small, so in future research a larger sample is recommended. Additional studies in a diverse sample are still needed to replicate findings.

## 5. Conclusions

The results of this study suggest that introducing a 5-month PE based on the AE programme leads to improvements in a student's performance social skills necessary for exhibiting assertive and social exposure behaviour. The programme does not influence the abilities related to effective behaviour patterns in close interpersonal relations. Participation in the programme does not improve the students' self-esteem, but comparing the experimental group, it positively influences the stability of this trait, while in the control group it tends to decrease. The most important contribution to the curriculum of PE lies in a simultaneous emphasis on the importance of physical activity/AE in the process of students' development (physical, mental, intellectual, and social) in the school environment, which is of great importance for the psycho-physical health and well-being of young people. Using the AE programme is recommended to make the lessons more attractive, so they can be introduced in school conditions, and with no specialized equipment, access to expensive materials, or special setting. Promoting the social and personal development of students is a good way to highlight the broad spectrum of benefits that come with participation in PE classes. The study contributes to the literature about the potential and the opportunities that PE classes offer for both the social and personal development of young people. The described research has important implications for PE teachers and team sports coaches, as

these professional groups should strive to provide the young people they are responsible for with regular opportunities for comprehensive development, with the view to improve their well-being—both during and after they finish their educational path.

Future research on the impact of the PE lesson programme should examine the possibility of developing other social competences of adolescent boys. Equally important in subsequent studies is the performance of a post-test to examine the development of competences over time and/or to test the sustainability of the programme effects.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/1660-4601/18/6/3021/s1>, Table S1: Overview of the Programme.

**Author Contributions:** Conceptualization, A.K.-S., A.K. and A.W.; methodology, A.K.-S., A.K. and A.W.; formal analysis, A.K.; investigation, A.K.-S.; data curation, A.K.-S.; writing—original draft preparation, A.K.-S., A.K., A.W.; writing—review and editing, A.K., A.W.; visualization, A.K.; supervision, A.W.; project administration, A.K.-S. All authors have read and agreed to the published version of the manuscript.

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**Institutional Review Board Statement:** The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of the Medical University of Karol Marcinkowski in Poznan (decision no. 467/19 and date of approval 04/11/2019).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on reasonable request from the corresponding author.

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Supplementary Material

**Overview of the Programme**

<b>Task related to Adventure Education (The amount of classes)</b>	<b>Task course</b>	<b>Competencies used over the course of tasks</b>	<b>Task goals</b>
Opening of the project. Participants get to know each other. (2)	Presentation of the programme goals and structure. Discussion of expectations and concerns as well as establishing common rules.	social exposure, self-awareness and self-esteem building	getting the participants to know each other, creating an atmosphere of trust and safety
Joint problem solving tasks.(16)	The course of the task in accordance with the stages of learning by doing: presentation of the task instructions, time for the participants for group planning of task execution and the division of roles, an attempt to perform the task joint reflection performing, the task again considering the reflection The trainer's role is to make sure that the safety rules are adhered to and to moderate the reflection process.	cooperation to achieve joint group goal, communication, assertiveness, social exposure, negotiations, action strategy planning	perfecting social competencies, building self-awareness and self-esteem
Tasks building mutual trust and self trust.(4)	The required level of trust during task participation increases with each subsequent exercise.	deeper confidence in one's abilities building trust to other participants, empathy, communication, assertiveness, cooperation	perfecting social competencies, building self-awareness and self-esteem
Closing of the programme, the final reflection.(2)	Reviewing all the classes with the participants in the form of presentations including photos and video. Reflection using the attributes that appear throughout the entire programme (e.g. blindfolds, boxes, ropes, hula hoops, etc.)	social exposure, self-awareness and self-esteem building	involving participants in the process of reflection, analysis of changes on the individual and group level, closing the project

## Article

# Correlates of Social Competences among Polish Adolescents: Physical Activity, Self-Esteem, Participation in Sports and Screen Time

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**Abstract:** Adolescents' social competences determine the effectiveness of social functioning. In the long term, a higher level of social competence increases readiness for university and increases the chance of achieving success in a professional career. The primary objective of this study is to examine the association between social competences and self-esteem, physical activity, screen time, and participation in sports among Polish adolescents. 106 adolescents completed the Social Competences Questionnaire (SCQ) and Rosenberg's Self-Esteem Scale (RSES), as well as selected questions from the Health Behavior in School Aged Children (HBSC). Analysis of the study variables showed a moderate statistically significant relationship between social competences and self-esteem ( $r_s = 0.55$ ,  $p < 0.001$ ). Statistical analysis also showed that adolescents who engage in moderate and vigorous physical activity (MVPA;  $\geq 5$  days/week) have significantly higher levels of social competences than adolescents with lower MVPA ( $Z = 3.50$ ,  $p < 0.001$ ). No significant statistical association was found between social competences and screen time, or participation in sport. Hierarchical multiple regression also suggested that higher self-esteem and engaging in moderate and vigorous physical activity is positively associated with higher social competences among adolescents. Adolescents' social competences are significantly associated with self-esteem and physical activity. The results can help those working with young people with social functioning difficulties in performing effective interventions and shaping policies.

**Keywords:** physical education; sport; physical activity; social competences; self-esteem; screen time; adolescents



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## 1. Introduction

Social competences (SCs) of adolescents determine the effectiveness of social functioning [1]. In the long term, a higher level of SCs in adolescents increases readiness for university, increases the chance of achieving success in a professional career, and helps to build positive relationships, thus supporting mental health [2]. The mental health of adolescents is an object of interest for the World Health Organization, which recommends the development of SCs as a way to prevent suicide among adolescents [3]. There is a link between the underdevelopment of SCs in childhood and adolescence and the difficulties associated with entering adulthood and taking on new social roles [4]. Research also suggests that SCs deficits are positively associated with an increased likelihood of exhibiting behavioral problems among adolescents [5]. The conditions in which young people function are changing dynamically, and education should contribute to equipping individuals with the skills to better understand themselves and others, as well as to function in a changing world. SCs are identified as important goals of education [6,7].

The definition of SCs implies that they are “complex skills conditioning the effectiveness of coping with certain types of social situations, acquired by the individual in the

course of social training” [1]. Coping in social situations is determined by a variety of specific skills, and SCs are therefore seen as a set of interrelated elements that individuals use to varying degrees depending on the circumstances in which they find themselves.

Researchers highlight the possibility of developing SCs through, among other things, participation in physical activity (PA) [8–11]. There are also reports of a positive association of self-esteem with PA [12–14] and doing sport [15,16], and an association between self-esteem and SCs [17] (p. 57). There are also studies highlighting the relationship between PA, screen time, and adolescent self-esteem [18]. However, there are no studies that resolve which variables are most important in shaping the level of SCs. Investigating the links between SCs in youth and self-esteem, screen time, PA, and sport participation can provide concrete evidence that can help in the performance of effective interventions and the shaping of policies.

SCs are related to self-esteem [17] (p. 57). Higher self-esteem is associated with greater courage and comfort in establishing new relationships [19]. Higher self-esteem in adolescents is related to a belief in oneself having better SCs, as well as perceiving oneself as socially attractive in interpersonal contacts [19]. In contrast, adolescents with low SC levels are more likely to be rejected by their peers and to have reduced interpersonal contacts. These adolescents are also more likely to have fewer opportunities to develop their social competences [19,20] and tend to have lower self-esteem [21,22]. It has been noted that adolescents with low self-esteem are more likely to choose solitude, which may be due to social and emotional disturbances in their development [23–26]. Research among adolescents shows that social problem-solving abilities and perceptions of social support are related to the prospect of higher self-esteem [27]. Teenagers with low self-esteem are less accepted by their peers, which increases the likelihood of separation from peers and loneliness [26,28]. In general, the ability to function in multiple social situations is related to self-esteem [29].

Research on the relationship between screen time and SCs in children and young people is inconsistent. Some studies highlight the role of screen time in establishing and maintaining social contacts [30]. A study of teenagers between the ages of 12 and 18 found that girls were more likely to use screen time to communicate with others, while boys were more likely to play passive games, watch videos, and use screen time for fun [31]. However, it is important to note that SCs are skills acquired in the course of social training, i.e., during social interaction [1]. According to research, teenagers aged 12–17 communicate most frequently via phones and text messages [32]. By choosing to communicate using ‘screens’, they may thus reduce the time spent on face-to-face communication [33], therefore reducing the opportunity to participate in social competences training.

According to guidelines proposed by the American Academy of Pediatrics, the maximum time spent in front of a screen should not exceed 2 h per day [34]. The negative effects of sedentary time may result from the substitution of active forms of time spent in favor of screen time. There are studies that have shown a link between time spent in front of a screen and adverse health outcomes in young people [35–37].

Associations between SCs and moderate and vigorous physical activity (MVPA) were noted, although they were relatively weak [38]. PA is a prerequisite for the maintenance of physical [39,40] and mental health [41]. PA plays a particularly important role in shaping young people’s lifestyles and habits, influencing their wellbeing [42] and representing an investment in their future health. As such, there are concerns about young people who do not meet PA guidelines of 60 min (1 h) or more a day [39,40]. Although at least 60 min per day of moderate and vigorous physical activity (MVPA) is recommended, PA levels decrease during adolescence [39,40], and sedentary behaviors increase, at the expense of mild PA [43]. A survey of 14–19 year-olds found a high prevalence of inadequate PA and spending time passively [44]. It has been estimated that over 80% of adolescents aged 13–15 years worldwide do not meet PA recommendations [45].

Young people who play sport have higher levels of SCs and better social relationships, as well as self-esteem and self-worth [13,16,46–48]. Various studies have shown that sport

has an impact on the acquisition and development of SCs [49–51]. Regular involvement in sports activities during childhood and adolescence contributes to the acquisition of SCs such as cooperation, awareness of responsibility, building empathy, self-control, and leadership [52,53]. In addition, compared to youths who do not participate in sports, those who do report better self-control, more assertive behaviors, higher self-esteem, and are rated by their teachers as displaying greater SCs [54].

Other studies show that young people who participate in sports activities improve their teamwork abilities, as well as SCs, emotional skills, and initiative [51]. Research conducted among socially vulnerable youth showed that sports participation was positively related to pro-social behavior, subjective health, well-being, and a sense of coherence [55].

The literature provides information on the associations of SCs with self-esteem, screen time, PA, and sport participation. However, it is not clear which variables play the greatest role in shaping SCs. Establishing the relationship and identifying the most relevant predictors of SCs will allow the most relevant factors to emerge in the context of the development of SCs. This will enable the setting of recommendations for shaping the SCs of young people and increasing their chances of success in everyday life, education, their careers. Improving the SCs of young people will support their well-being and mental health.

Analysis of the relationship between SCs and PA, screen time, participation in sports, and self-esteem among Polish adolescents may be useful in constructing recommendations for teachers who want to enable the development of SCs. Findings from the study can also be used to help design future research, interventions, and programs aimed at developing SCs in Polish adolescents. To our knowledge, no studies have been conducted on Polish adolescents to address the examination of SCs and its relationship with PA, screen time, sports participation, and self-esteem. Therefore, the present study may provide a foundation for future research focused on this population.

The primary objective of this study is to examine the association between social competences and self-esteem, physical activity, screen time, and participation in sports among Polish adolescents. It was hypothesized that higher self-esteem, higher levels of PA, and engagement in sport would be positively associated with SCs among adolescents, while screen time would be negatively associated with SCs.

## 2. Materials and Methods

### 2.1. Participants and Procedure

A cross-sectional research design was used in this study to examine the correlates of social competences among Polish adolescents. The study group comprises 106 adolescents (84 boys and 22 girls) aged 15–16 years old ( $M = 15.75 \pm 0.44$ ). The study was based on convenience sampling. Only the teenagers whose parents gave written consent to their children's participation in the study took part in the research. Permission was also obtained to publish the research results. The full description and objectives of the study were presented to parents and teenagers. Participants took part voluntarily and signed informed consent forms. Only a complete set of data was used for the statistical analyses. Young people completed the questionnaires in a quiet environment during a physical education lesson. It took them 40 min. The general characteristics of the participants are found in Table 1.

**Table 1.** General characteristics of the participants ( $N = 106$ ).

Variables	Total $n = 106$	
Age ( $M \pm SD$ )	15.75 $\pm$ 0.44	
Gender ( $n/\%$ )		
Boys	84	79.2
Girls	22	20.8
Mother's education ( $n/\%$ )		
Primary education	4	3.8
High education	33	31.1
Tertiary education	69	65.1
Father's education ( $n/\%$ )		
Primary education	2	1.9
High education	46	43.8
Tertiary education	57	54.3
Perceived family wealth ( $n/\%$ )		
Wealthy/rather wealthy	38	35.8
Average	64	60.4
Poor/rather poor	4	3.8
SCQ ( $M \pm SD$ )	162.32 $\pm$ 27.86	
RSES ( $M \pm SD$ )	27.53 $\pm$ 6.20	
HBSC		
MVPA ( $n/\%$ )		
MVPA < 5 days/week	79	74.5
MVPA $\geq$ 5 days/week	27	25.5
Screen time ( $M \pm SD$ )	4.22 $\pm$ 1.52	
Participation in sports ( $n/\%$ )	38	35.9

Note: SCQ = Social Competences Questionnaire, RSES = Rosenberg Self-Esteem Scale, MVPA = moderate and vigorous physical activity,  $M$  = Mean,  $SD$  = Standard Deviation.

The study was conducted in accordance with the Declaration of Helsinki. The Local Bioethics Committee (Karol Marcinkowski University of Medical Sciences in Poznan) approved the study (decision no. 467/19). The teenagers were informed of the anonymity and voluntary nature of taking part in the study, as well as the confidentiality of the results and the impossibility of identifying individual data in the final report. Parents signed a written consent form for their children to participate in the study.

## 2.2. Instruments

### 2.2.1. Social Competences Questionnaire Version for Adolescents (SCQ)

The SCQ is a Polish questionnaire for measuring SCs in young people. SCQ allows the determination of the level of SCs [1], which are defined as skills that determine the effectiveness of an individual's functioning in multiple social situations. The coefficient alpha of this tool is 0.94 [1] (p.5), while the coefficient alpha calculated for this research was 0.95.

The SCQ is a self-descriptive questionnaire, containing 90 affirmative sentences in infinitive form and referring to a variety of social tasks and activities. The respondent is asked to rate the effectiveness of their actions on a scale described by four adjectives: definitely (4) good, not bad (3), rather poor (2), definitely bad (1). 60 sentences are diagnostic items (concerning SCs, the score ranges from 60 to 240) and the rest are non-diagnostic items. The sample items are: "How well you would do if you had to deliver a paper in class", or "How well you would do if you had to speak in a larger group discussion".

### 2.2.2. Rosenberg's Self-Esteem Scale (RSES)

The Polish version of Rosenberg's Self-Esteem Scale [29] was used to study self-esteem. The questionnaire examines the level of global self-esteem. It contains 10 statements, of which five statements are formulated in a positive way and the rest in a negative way. Respondents answer on a four-point scale (1 = strongly disagree to 4 = strongly agree) [22].

An example statement is as follows: “Overall, I’m satisfied with myself”. The scoring for positive sentences is reversed, allowing higher scores to be awarded in relation to higher self-esteem [22]. RSES is used to survey adolescents. The coefficient alpha for the Polish version is 0.81 [29], while the coefficient alpha calculated for the present sample was 0.90.

### 2.2.3. The Health Behavior in School Aged Children (HBSC)

Selected questions from the HBSC were used to examine the following independent variables: level of PA, participation in sport and time in front of a screen. Questions relating to socio-economic data were also used. The PA level was measured by the MVPA index [56]. MVPA is defined as the average number of days per week on which participants were engaged in various forms of PA for at least 60 min, during which, in their subjective assessment, their heart rate increased and they breathed faster. The range of possible answers is 0–7 days per week. This question was included in the HBSC from a test by Prochaska et al. [57] The subjects answered 2 questions, which are as follows: Q1: How many days in the last 7 days have you been physically active for at least 60 min a day? Q2: During a normal week, on how many days are you physically active for at least 60 min a day? The formula used to calculate MVPA is as follows:  $MVPA = (Q1 + Q2)/2$  where: MVPA = PA ratio; Q1 = number of physically active days in the last 7 days; Q2 = number of physically active days in a normal week. Data on participation in sport were obtained from answers to the question, “Do you participate in organized activities in your free time? Organized activities are those that take place at a sports club, leisure center, or organization”. The question refers to two categories of organized sports activities—individual and team—with the option to answer ‘yes’ or ‘no’. Respondents who answered ‘yes’ at least once were classified as participating in organized sports activities.

An independent variable—screen time—was estimated from the following question: “How many hours a day, in your free time, do you usually use your computer, tablet, or smartphone (chatting, using the Internet, sending emails, Twitter, Facebook, Instagram, watching videos, playing games, etc.)?” The amount of screen time was declared by the respondent separately for school days (P1) and weekends (P2). A screen-time index was calculated based on the following formula:  $Screen\ time = (P1 \times 5 + P2 \times 2)/7$  where: Screen time = P1 = number of hours per day on school days, P2 = number of hours per day at the weekend. The screen time score is a weighted average of the entire week [58]. According to the guidelines of the American Academy of Pediatrics Committee on Public Education, maximum screen time should not exceed 2 h per day [34]. In this study, screen time results were divided into the following two categories: <2 h per day and  $\geq 2$  h per day.

Questions on socioeconomic background were also used to characterize participants, including questions on age, family, wealth, and parental education.

### 2.3. Statistical Analysis

All statistical analyses were performed with Statistica 13.1 (StatSoft Polska sp. z o.o., 2021). The quantitative variables studied were presented by mean ( $M$ ) and standard deviation ( $SD$ ), while the qualitative variables were presented by count ( $n$ ) and percentage (%). The data were screened and checked against the assumptions of regression analysis. The Mann-Whitney ( $Z$ ) test was used to assess the statistical significance of the association between the independent variables and the SCQ, and of the independent variables between each other. Spearman’s rank correlation coefficients  $r_s$  were used to assess the significance and power of the relationships between variables, with a value of correlation strength as follows:  $\leq 0.39$  weak, 0.40–0.59 moderate, and  $\geq 0.60$  strong [59]. Pearson’s chi-squared test was also used. A hierarchical multiple regression was conducted with SCs as a dependent variable in order to test the study hypothesis. Only the variables that correlated significantly with SCQ were included in the model. Significance was accepted as  $p < 0.05$  throughout the analysis.

### 3. Results

#### 3.1. Preliminary Analysis

The analysis of the studied variables showed that as social competences increase, the level of self-esteem of adolescents increases. This association is moderately statistically significant ( $r_s = 0.55$ ,  $p < 0.001$ ). At the same time, statistical analysis showed that higher levels of social competences are found in people with higher MVPA  $\geq 5$  days/week ( $177.7 \pm 26.13$ ) than in people with lower MVPA  $< 5$  days/week ( $157.1 \pm 26.58$ ). This difference is statistically significant ( $Z = 3.50$ ,  $p \leq 0.001$ ). There was no statistically significant association between SCs and screen time ( $r_s \geq 0.01$ ,  $p = 0.999$ ), nor any statistically significant variation with respect to participation in sport ( $Z = -0.95$ ,  $p = 0.343$ ). Spearman's rank correlation coefficient for SCQ, RSES, and screen time are presented in Table 2. Mann-Whitney (Z) U test results for SCQ, RSES, and screen time in relation to MVPA and sport participation are presented in Table 3. Pearson's chi-square test was used to examine differences between MVPA and Participation in sports. The results are statistically significant ( $Chi^2 = 6.12$ ,  $p = 0.013$ ).

**Table 2.** Spearman's rank correlation coefficient for SCQ, RSES, and Screen time.

Variable 1	Variable 2	$r_s$	$p$ Value
SCQ	RSES	0.55	$\leq 0.001$
SCQ	Screen time	$< 0.01$	0.999
RSES	Screen time	0.02	0.821

Note: SCQ = Social Competences Questionnaire, RSES = Rosenberg Self-Esteem Scale.

**Table 3.** Mann-Whitney U test (Z) for SCQ, RSES, and Screen time depending on MVPA and participation in sports.

Variable	MVPA		Participation in Sports	
	Z	$p$ Value	Z	$p$ Value
SCQ	3.50	$\leq 0.001$	-0.95	0.343
RSES	-0.37	0.714	-0.20	0.838
Screen time	1.27	0.216	2.02	0.041

Note: SCQ = Social Competences Questionnaire, RSES = Rosenberg Self-Esteem Scale, MVPA = moderate and vigorous physical activity.

#### 3.2. Hierarchical Multiple Regression

A hierarchical multiple regression model was built with SCs as a dependent variable, and is presented in Table 4. The model included 2 independent variables that correlated significantly with SCs. In the first step, self-esteem was included in the model ( $R^2 = 0.34$   $p \leq 0.001$ ;  $F_{1,143} = 52.35$ ,  $p \leq 0.001$ ). In the second step, MVPA was included in the model. The final model was significant and explained a considerable proportion of variance in global SC levels ( $R^2 = 0.43$   $p \leq 0.001$ ;  $F_{2,103} = 38.00$ ,  $p \leq 0.001$ ).

**Table 4.** Regression analysis predicting SCQ ( $N = 106$ ).

Variables	$R^2$	B	F	$p$ Value
Step 1	0.34		52.35	$\leq 0.001$
RSES		0.58		$\leq 0.001$
Step 2	0.43		38.00	$\leq 0.001$
RSES		0.57		$\leq 0.001$
MVPA		0.30		0.0001

Note: RSES = Rosenberg Self-Esteem Scale, MVPA = moderate and vigorous physical activity.

### 4. Discussion

The primary objective of this study is to examine the association between social competences and self-esteem, physical activity, screen time, and participation in sports

among Polish adolescents. As a result of this study, the hypothesis was partially confirmed. This means that the SCs of young people are related to self-esteem and physical activity (physical activity level was determined based on the moderate and vigorous physical activity). In contrast, SCs are not related to screen time and participation in sports activities.

Based on the analysis of the results, two variables were identified whose relationship reached statistical significance: self-esteem and moderate and vigorous physical activity. When the association of the SCs with screen time and participation in sport was analyzed, there was no statistically significant association. The independent variables—self-esteem and moderate and vigorous physical activity—which were significantly associated with SCs were used to build a multivariate analysis model. Using a multivariate analysis model, the role of the self-esteem and moderate and vigorous physical activity variables, which correlate internally with each other, was determined, and their combined prediction of SCs appeared to explain SCs to a high degree.

The reported association of SCs with self-esteem confirms the findings of other studies, in which correlational analyses have shown that SCs were positively related to self-esteem [29,60,61]. The literature on adolescents provides numerous reports on the association of physical activity with mental health, self-esteem, and well-being [16,41,42], but the association of SCs with moderate and vigorous physical activity has not been sufficiently studied in this age group. Some empirical studies [8,9,62] provide information about the effect of physical activity on SCs, such as the effect of a 4-week physical activity-based Positive Youth Development program that resulted in participants achieving higher levels of SCs [62]. Similar reports have also been reported in other physical activity-based intervention programs: the Physical Education Based on the Adventure Education Program [9] and the Cooperative Physical Education Program [8].

Adolescence makes a teenager vulnerable in the emotional and social spheres [63]. On the one hand, it is a time of intense achievement of social maturity and, on the other, a time of increased vulnerability to adverse environmental and social influences, which can lead to many behavioral and emotional problems [63].

The present study provides information on the statistically significant association of SCs with self-esteem and moderate and vigorous physical activity. Self-esteem and moderate and vigorous physical activity make substantial provisions for SCs. Discovering the intrinsic correlation of self-esteem and moderate and vigorous physical activity as predictors of SCs allows us to gain a better understanding of SCs and thus design more effective interventions to strengthen and develop the SCs of young people.

This study has several potentially important limitations. Firstly, the data were collected at one high school in Poznan. Results can thus not be generalized to the whole Polish adolescent population. Secondly, the analyzed data were obtained via self-reporting, which may be a source of considerable bias.

Research to date has not focused sufficiently on adolescents' SCs and their relationship with self-esteem and moderate and vigorous physical activity. Analogous studies were mostly conducted among children in early and late childhood [64,65]. However, it is young people who are going through a critical period of adolescence in terms of mental health and well-being and who are at greater risk of the negative consequences of unsatisfactory social relationships [63]. The results have important implications for future research examining these relationships in other populations of adolescents. Therefore, the study of adolescent SCs and the analysis of SC predictors provides information in the context of prevention and the design of remedial actions to protect or improve the mental health and well-being of adolescents.

The present results show the relationship of self-esteem, moderate and vigorous physical activity, and SCs. The majority of students do not meet physical activity recommendations [56], and for that reason physical education (PE) lessons are an important opportunity to be physically active [66]. Providing regular physical activity to students is a key objective of PE. It should be noted that the objectives of PE treat the student comprehensively and address a variety of aspects, from the teaching of motor competences



to the development of personal and social competences [67]. Therefore, it can be assumed that PE lessons are an appropriate opportunity for physical development, while at the same time enabling the development of SCs in adolescents. The results of this study also justify the implementation of intervention programs during PE lessons aimed at developing SCs [8,9,62].

In light of the results presented, it can be assumed that PE lessons are a suitable opportunity for the development of SCs in adolescents, which have been neglected during the period of remote learning caused by the COVID-19 pandemic, limiting the possibility of their development [68].

## 5. Conclusions

Adolescents' SCs are significantly associated with self-esteem and physical activity. Combined prediction and self-esteem explain SCs to a significant extent. SCs determine the effectiveness of young people's social functioning and are therefore important in terms of building and maintaining relationships with parents, peers, educators, and, in the future, co-workers, which ultimately has significant implications for current and future well-being and life satisfaction. This study highlights the important role of self-esteem and physical activity in the prediction of adolescent SCs. Based on the present research, it can be assumed that strengthening youth self-esteem and ensuring youth physical activity will contribute to the development and improvement of youth SCs.

The results of this study may be particularly useful for PE teachers who want to work holistically with students and influence both the physical and social developmental spheres of adolescents.

The presented research findings revealing the relationship of SCs with self-esteem and physical activity of adolescents can provide valuable guidance for both researchers and educators working with young people, providing information on what factors support the formation of SCs. The present results may also be helpful for psychologists and educators working with young people with behavioral problems and difficulties in social functioning. More broadly, the findings provide concrete evidence that can help in performing effective interventions and shaping policies.

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