

# fizjoterapia polska



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# TOKSYNA BOTULINOWA TYPU A XEOMIN® W PROGRAMACH LEKOWYCH

LEK XEOMIN® MOŻE BYĆ STOSOWANY  
W RAMACH PROGRAMÓW LEKOWYCH  
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- Kręcz karku
- Połowiczny kurcz twarzy
- Kurcz powiek
- Dystonie zadaniowe  
(np. kurcz pisarski i kurcze zawodowe)



Leczenie poudarowej spastyczności kończyny górnej  
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## Skrócona informacja o leku

### XEOMIN® - 100 jednostek, proszek do sporządzania roztworu do wstrzykiwań

**Skład:** Jedna fiolka zawiera 100 jednostek neurotoksyny *Clostridium botulinum* typu A (150 kD), wolnej od białek kompleksujących. **Wskazania:** Objawowe leczenie kurczu powiek i połowiczego kurczu twarzy, dystonii szynnej z przewagą komponenty rotacyjnej (kurczowy kręcz szyi), spastyczności kończyny górnej i przewlekłego ślinotoku z powodu zaburzeń neurologicznych u dorosłych. **Dawkowanie:** Po rekonstytucji XEOMIN® jest przeznaczony do podawania domięśniowego lub do gruczołu ślinowego. Powinien zostać zużyty podczas jednej sesji podania i tylko dla jednego pacjenta. Optymalna dawka, częstotliwość podawania i liczba miejsc wstrzyknięcia powinny zostać określone przez lekarza indywidualnie dla każdego pacjenta. Dawkę należy zwiększać stopniowo. **Kurcz powiek i połowiczny kurcz twarzy:** Dawka początkowa: 1,25 do 2,5 j. na jedno miejsce wstrzyknięcia, max. 25 j. na jedno oko. Dawka całkowita: max. 50 j. na jedno oko co 12 tygodni. Odstępów czasowych pomiędzy zabiegami należy określić na podstawie rzeczywistych wskazań klinicznych dla danego pacjenta. Jeżeli dawka początkowa okaże się niewystarczająca, można ją zwiększyć maksymalnie dwukrotnie podczas kolejnego podania produktu. Wydaje się jednak, że wstrzykiwanie więcej niż 5 j. w jedno miejsce nie przynosi dodatkowych korzyści. Pacjentów z połowicznym kurczem twarzy powinno się leczyć w taki sam sposób, jak w przypadku jednostronnego kurczu powiek. **Kurczowy kręcz szyi:** W pierwszym cyklu leczenia max. 200 j., z możliwością wprowadzenia zmian w kolejnych cyklach, na podstawie odpowiedzi na leczenie. W każdej sesji całkowita dawka max. 300 j. i nie więcej niż 50 j. w każde miejsce wstrzyknięcia. Nie należy wykonywać obustronnych wstrzyknięć do mięśnia mostkowo-obojczykowo-sutkowego, ponieważ wstrzykiwanie obustronne lub podawanie dawek ponad 100 j. do tego mięśnia niesie ze sobą zwiększone ryzyko działań niepożądanych, szczególnie zaburzeń połykania. Nie zaleca się powtarzania zabiegów częściej niż co 10 tygodni. **Spastyczność kończyny górnej:** Dawka całkowita: max. 500 j. podczas jednej sesji i max. 250 j. do mięśni ramienia. Zalecane dawki do podania do poszczególnych mięśni – patrz Charakterystyka Produktu Leczniczego. Nie należy wstrzykiwać kolejnych dawek częściej niż co 12 tygodni. **Przewlekły ślinotok:** Stosować roztwór o stężeniu 5 j./0,1 ml. Lek podaje się do ślinianek przyusznych (po 30 j. na każdą stronę) i do ślinianek podżuchowych (po 20 j. na każdą stronę). Łącznie podaje się max. 100 j. i nie należy przekraczać tej dawki. Nie należy wstrzykiwać kolejnych dawek częściej niż co 16 tygodni. **Przeciwwskazania:** Nadwrażliwość na substancję czynną lub na którąkolwiek substancję pomocniczą, uogólnione zaburzenia czynności mięśniowej (np. miastenia gravis, zespół Lamberta-Eaton), infekcja lub stan zapalny w miejscu planowanego wstrzyknięcia. **Przeciwwskazania względne:** Lek XEOMIN® należy stosować ostrożnie u pacjentów ze stwardnieniem zanikowym bocznym, chorobami wywołującymi zaburzenia czynności nerwowo-mięśniowej, wyraźnym osłabieniem lub zanikiem mięśni, z ryzykiem rozwoju jaskry z wąskim kątem przesączania. **Ostrzeżenia:** Należy zachować ostrożność, aby nie doszło do wstrzyknięcia leku XEOMIN® do naczyń krwionośnych. W leczeniu dystonii szynnej oraz spastyczności należy zachować ostrożność przy wstrzykiwaniu leku XEOMIN® w miejsca znajdujące się w pobliżu wrażliwych struktur, takich jak tętnica szyjna, szczyty płuc lub przełyk. Należy zachować szczególną ostrożność podczas stosowania leku XEOMIN® u pacjentów z zaburzeniami układu krzepnięcia lub przyjmujących produkty przeciwzakrzepowe lub substancje, które mogą mieć działanie przeciwzakrzepowe. Nie należy przekraczać zalecanej dawki jednorazowej leku XEOMIN®. Duże dawki mogą spowodować paraliż mięśni znacznie oddalonych od miejsca wstrzyknięcia produktu. Przypadki dysfagii odnotowano również w związku ze wstrzyknięciem produktu w miejscach innych niż mięśnie szynne. Pacjenci z zaburzeniami połykania i zachłyśnięciami w wywiadzie powinni być traktowani ze szczególną ostrożnością. Odnotowywano przypadki wystąpienia reakcji nadwrażliwości na produkty zawierające neurotoksynę botulinową typu A. **Działania niepożądane: Niezależne od wskazań:** Miejscowy ból, stan zapalny, parestezja, niedoczulica, tkliwość, opuchlizna, obrzęk, rumień, świąd, miejscowe zakażenie, krwaki, krwawienie i/lub siniak. Ból i/lub niepokój związany z ukłuciem może prowadzić do reakcji wazowagalnych, włącznie z przejściowym objawowym niedociśnieniem, nudnościami, szumem w uszach oraz omdleniem. Objawy związane rozprzestrzenianiem się toksyny z miejsca podania - nadmierne osłabienie mięśni, zaburzenia połykania i zachłystowe zapalenie płuc ze skutkiem śmiertelnym w niektórych przypadkach. Reakcje nadwrażliwości - wstrząs anafilaktyczny, choroba posurowicza, pokrzywka, rumień, świąd, wysypka (lokalna i uogólniona), obrzęk tkanek miękkich (również w miejscach odległych od miejsca wstrzyknięcia) i duszność. Objawy grypopodobne. **Kurcz powiek i połowiczny kurcz twarzy:** Bardzo często: opadanie powieki. Często: zespół suchego oka, niewyraźne widzenie, zaburzenia widzenia, suchość w jamie ustnej, ból w miejscu wstrzyknięcia. **Niezbyt często:** wysypka, ból głowy, porażenie nerwu twarzowego, podwójne widzenie, nasilone łzawienie, zaburzenie połykania, osłabienie mięśni, zmęczenie. **Kurczowy kręcz szyi:** Bardzo często: zaburzenia połykania (z ryzykiem zachłyśnięcia się). Często: ból głowy, stan przedomdleniowy, zawroty głowy, suchość w jamie ustnej, nudności, nadmierne potliwość, ból szyi, osłabienie mięśni, ból mięśni, skurcze mięśni, sztywność mięśni i stawów, ból w miejscu wstrzyknięcia, astenia, infekcje górnych dróg oddechowych. **Niezbyt często:** zaburzenia mowy, dysfonia, duszność, wysypka. **Spastyczność kończyny górnej:** Często: suchość w jamie ustnej. **Niezbyt często:** ból głowy, zaburzenia czucia, niedoczulica, zaburzenia połykania, nudności, osłabienie mięśni, ból kończyn, ból mięśni, astenia. **Przewlekły ślinotok:** Często: parestezje, suchość w jamie ustnej, zaburzenia połykania. **Niezbyt często:** zaburzenia mowy, zagęszczenie śliny, zaburzenia smaku. **Dostępne opakowania:** 1 fiolka zawierająca 100 jednostek neurotoksyny *Clostridium botulinum* typu A (150 kD). **Pozwolenie na dopuszczenie do obrotu:** Nr 14529, wydane przez Min. Zdrowia. **Kategoria dostępności:** Lek wydawany z przepisu lekarza (Rp.). Przed zastosowaniem leku XEOMIN® bezwzględnie należy zapoznać się z pełną treścią Charakterystyki Produktu Leczniczego.

Informacja na podstawie Charakterystyki Produktu Leczniczego z dnia 25.10.2019

Podmiot odpowiedzialny: Merz Pharmaceuticals GmbH, Frankfurt/Main, Niemcy

Informacja naukowa: 22 / 252 89 55

XM-129/2021/2

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Ciągle poszerzanie wiedzy jest na stałe wpisane w zawód fizjoterapeuty. Wychodząc naprzeciw potrzebom poszukujących aktualnej, sprawdzonej i kompleksowej wiedzy PZWL Wydawnictwo Lekarskie oferuje ponad 140 tytułów z tej dziedziny. Książki budujące podstawy teorii, jak i rozwijające umiejętności praktyczne towarzyszą fizjoterapeutom na wszystkich etapach rozwoju zawodowego.



**Uzupełnij bibliotekę fizjoterapeuty  
O BRAKUJĄCE TYTUŁY I NOWOŚCI!**

Sprawdź na [pzwl.pl/podreczniki-fizjoterapia](http://pzwl.pl/podreczniki-fizjoterapia)



# SKUTECZNE METODY LECZENIA W DOBIE PANDEMII

Pandemia spowodowana COVID-19 to ogromne wyzwanie dla systemu ochrony zdrowia. Obecnie nie tylko w Polsce, ale i w wielu miejscach na świecie, mierzymy się z kryzysem zdrowotnym. Jest to czas, w którym należy szukać skutecznych rozwiązań. Wiele międzynarodowych firm angażuje się przede wszystkim w poszukiwaniu oraz udostępnianie pacjentom innowacyjnych terapii, odpowiadających na istotne wyzwania zdrowotne. Na polskim ryn-

ku również możemy wskazać firmy, które aktywnie poszukują rozwiązań bieżącego kryzysu zdrowotnego. Jedną z nich jest działająca od wielu lat marka RehMedica. Jedną z niewielu, która szybko zareagowała na potrzeby polskiego pacjenta w dobie kryzysu. Nie pozostała obojętna na wyzwania, z jakimi w czasie pandemii mierzy się system ochrony zdrowia i polskie społeczeństwo. Poza podstawową ofertą czyli Programem Rehabilitacja+ i skutecznym produktem, którym jest materac rehabilitacyjny MagneSilver, z którego skorzystało tysiące osób, na co dzień zmagających się z wieloma dolegliwościami, RehMedica zaangażowała się w nowy projekt edukacyjny zwany Program Odporność+. Jako podmiot medyczny, firma czuła się w obowiązku, aby być jeszcze bliżej swoich pacjentów i pomóc w sytuacji bezpośredniego zagrożenia. Jako jedni z nielicznych na rynku RehMedica zaczęła edukować w kwestii naturalnego podniesienia odporności i propagować założenia Programu Odporność+. Wyrobiona dzięki programowi odporność – jest najlepszym gwarantem zdrowia, dobrego samopoczucia, kondycji, uśmiechu, dobrych relacji. To nie przesada, że brak odporności sprzyja rodzeniu się depresji i prowadzi do dysfunkcji społecznych. Jednostki słabiej radzą sobie bez wsparcia. Dlatego Program Odporność+ stawia na rozwinięcie mechanizmów obronnych. Jego holistyczne podejście ma ogromny wpływ w budowaniu naturalnej odporności. Prawidłowe funkcjonowanie układu immunologicznego jest bardzo istotne, ponieważ chroni przed chorobami, a jeśli już zachorujemy, to możemy mieć gwarancję, że nasz organizm szybciej sobie poradzi z infekcją. Program Odporność+ jest bogaty i merytoryczny, gdyż specjaliści RehMedica patrzą na odporność pod wieloma aspektami. Podstawą programu jest systematyczne korzystanie z leczniczego pola magnetycznego, które jak udowodniono w wielu publikacjach naukowych, ma pozytywne działanie w budowaniu odporności. Pandemia spowodowana COVID-19 nasiliła występowanie chorób, które wcześniej nie były spotykane na taką skalę. Dlatego RehMedica w ramach swojego programu współpracuje z poradnią dietetyczną, psychologiczną i fizjoterapeutyczną. Na co dzień wspiera swoimi działaniami uczestników programu.

Zadajemy sobie pytanie – czy pomiędzy zdrowiem, a tym co spożywamy istnieje zależność? Odpowiedź brzmi: oczywiście, że tak. Odpowiednia dieta wzmacnia odporność organizmu i zdecydowanie poprawia samopoczucie. Równocześnie uświadamiamy Państwu, jaki negatywny wpływ na odporność mają tak zwane złe nawyki, np. mała ilość snu, alkohol czy inne używki, a także brak ruchu. Mając świadomość, że wysoka odporność może ułatwić lub nawet uchronić przed infekcjami, dietetyk współpracujący z Programem Odporność+ przygotował odpowiednio wyselekcjonowany pakiet suplementów diety. Każdy uczestnik Programu Odporność+ otrzymuje zestaw takich suplementów z odpowiednimi zaleceniami i indywidualnie opracowaną dietą uwzględniającą inne jednostki chorobowe, z którymi boryka się dany pacjent. Zależność pomiędzy odpornością a psychiką – to drugi ważny czynnik. W ramach Programu Odporność+, RehMedica rozpoczęła współpracę z psychologiem, który na co dzień wspiera swoimi działaniami. Podczas, gdy obecnie na



ku również możemy wskazać firmy, które aktywnie poszukują rozwiązań bieżącego kryzysu zdrowotnego. Jedną z nich jest działająca od wielu lat marka RehMedica. Jedną z niewielu, która szybko zareagowała na potrzeby polskiego pacjenta w dobie kryzysu. Nie pozostała obojętna na wyzwania, z jakimi w czasie pandemii mierzy się system ochrony zdrowia i polskie społeczeństwo. Poza podstawową ofertą czyli Programem Rehabilitacja+ i skutecznym produktem, którym jest materac rehabilitacyjny MagneSilver, z którego skorzystało tysiące osób, na co dzień zmagających się z wieloma dolegliwościami, RehMedica zaangażowała się w nowy projekt edukacyjny zwany Program Odporność+. Jako podmiot medyczny, firma czuła się w obowiązku, aby być jeszcze bliżej swoich pacjentów i pomóc w sytuacji bezpośredniego zagrożenia. Jako jedni z nielicznych na rynku RehMedica zaczęła edukować w kwestii naturalnego podniesienia odporności i propagować założenia Programu Odporność+. Wyrobiona dzięki programowi odporność – jest najlepszym gwarantem zdrowia, dobrego samopoczucia,



wizytę do psychologa (nawet prywatną) czeka się nawet do kilku miesięcy takie wsparcie jest nieocenione. Dobrostan psychiczny pacjenta pozwala również na uzyskanie szybszych efektów w leczeniu różnych chorób.

Program Odporność+ stawia równocześnie na aktywność fizyczną. Badania wskazują na poprawę odporności u osób prowadzących aktywny tryb życia, w porównaniu do osób spędzających większość czasu w pozycji siedzącej. Regularna i umiarkowana aktywność fizyczna zmniejsza ryzyko infekcji, a także zapobiega rozwojowi chorób przewlekłych. Fizjoterapeuta, który jest do dyspozycji uczestników Programu Odporność+ stawia na nowoczesne narzędzia, ćwiczenia na materacu rehabilitacyjnym MagneSilver. Efekty są znacznie szybsze, niż w przypadku ćwiczenia na zwykłej macie lub kocu. Osoby systematycznie ćwiczące na materacu rehabilitacyjnym MagneSilver czują satysfakcję, poprawę samopoczucia i zmniejszenie uciążliwych dolegliwości. Dlatego warto ćwiczyć codziennie i wybierać ogólnie mówiąc zdrowy styl życia.

Materac MagneSilver poprawia jakość snu. Jak wiadomo sen jest kluczowym czynnikiem mającym wpływ na nasze zdrowie. Brak snu lub jego zła jakość, w dłuższej perspektywie, prowadzi do przemęczenia, stresu, a w konsekwencji do wielu chorób (m.in. otyłości, cukrzycy typu 2, nadciśnienia tętniczego).

Własna odporność, którą można wzmacniać – to nasza pierwsza linia obrony, tak wskazują lekarze współpracujący w ramach programu.

Programy RehMedica to również profesjonalny turnus rehabilitacyjny. Ośrodek Rehabilitacji Leczniczej w Łęczkach odnosi sukcesy w przywracaniu pacjentom zdrowia, dlatego że mocno stawia na odpowiednie warunki rehabilitacyjne i stałe wsparcie fachowej kadry. Pacjenci odzyskują wiarę we własne możliwości, widzą, jak poprawia się ich kondycja, jak wracają siły i zdrowie. Turnusy rehabilitacyjne odbywają się w profesjonalnym Ośrodku Rehabilitacji Leczniczej RehMedica przy Hotelu Łęczeczki. To tu każdy pacjent czuje, że jest najważniejszy i odbywa konkretną terapię. Pacjenci otrzymują plany i indywidualny dobór ćwiczeń. Czują, że nie są pozostawieni samym sobie. Z własną wiarą, popartą pierwszymi efektami rehabilitacji, faktycznie odzyskują zdrowie! Efektowna terapia prowadzi w takich warunkach do regeneracji uszkodzonych struktur.

Podczas intensywnego turnusu rehabilitacyjnego, pacjent oprócz oczywistych zabiegów fizjoterapeutycznych (np. masaże, krioterapia, sollux, elektrostymulacja, ultradźwięki, terapia TR, fala uderzeniowa) otrzymuje również ogromną dawkę wiedzy. RehMedica stawia na edukację, dlatego każdego dnia podczas turnusu odbywają się panele dydaktyczne na ważne tematy zdrowotne m.in. „Witamina D kluczem do zdrowia” czy „Odporność bierze się z jelit”.

PROFESJONALNY TURNUS REHABILITACYJNY. OŚRODEK REHABILITACJI LECZNICZEJ PRZY HOTELU ŁĘZECZKI.



Program Odporność+ jest zdecydowanie dla osób świadomych, które cenią sobie holistyczne podejście do zdrowia. Nasz program zakłada, że zdrowie wynika z harmonijnej pracy organizmu dzięki czynnikom takim jak: odżywcza dieta, codzienny ruch, regenerujący sen, radzenie sobie ze stresem, dobre relacje z innymi i samym sobą oraz życie w zgodzie z naturą. Podstawą do działania jest samozaparcie pacjenta, jego pewność, że chce zmienić swoje życie. My pomagamy i wspieramy wielopłaszczyznowo.

Jeżeli myślicie tak samo, to ten program jest dla Państwa.

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- Fizjoterapii
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dostarczając sprzęt do fizjoterapii.



## Partner PZN

Dzień 9 lipca 2020 roku był dla METRUM CRYOFLEX wyjątkowy, ponieważ właśnie w tym dniu firma została partnerem Polskiego Związku Narciarskiego. Dla polskiej marki, od ponad 29 lat produkującej nowoczesny sprzęt do rehabilitacji i fizjoterapii, była to duża nobilitacja, ale też dodatkowa motywacja do dalszego rozwoju.

Cała załoga METRUM CRYOFLEX od zawsze trzymała kciuki za Narodową Kadrę Skoczków Narciarskich, a od lipca 2020 roku może wspierać ich również sprzętowo.

Skoczkowie polskiej kadry są pod doskonałą opieką profesjonalnego sztabu, który codziennie dba o ich dobrą kondycję i zdrowie. METRUM CRYOFLEX poprzez podpisaną umowę stało się częścią tego medalowego zespołu, a dostarczony przez nich sprzęt pomaga w regeneracji skoczków po obciążających treningach i zawodach, umożliwiając szybki powrót do formy.

Fizjoterapia jest nieodzownym składnikiem sukcesu we współczesnym sporcie, ponieważ przed sportowcami stawia się coraz wyższe wymagania. Muszą oni walczyć nie tylko z rywalami, ale także z wydajnością własnego organizmu. Z pomocą przychodzą nowoczesne urządzenia do fizjoterapii i rehabilitacji, które dają wytchnienie zmęczonym mięśniom, przyspieszając ich regenerację i likwidując bóle.

Oferta METRUM CRYOFLEX obejmuje aparaty do fizjoterapii i rehabilitacji, m.in.:

- aparaty do terapii skojarzonej (elektroterapia + ultradźwięki),
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- aparaty do terapii ultradźwiękami,
- aparaty do elektroterapii,
- aparaty do laseroterapii,
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# Knowledge, skills and perceptions of COVID-19 among physiotherapy students in the United Arab Emirates: A Qualitative Study

*Wiedza, umiejętności i postrzeganie COVID-19 wśród studentów fizjoterapii w Zjednoczonych Emiratach Arabskich: badanie jakościowe*

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## Abstract

**Aims.** The aims of this qualitative study were to explore how physiotherapy students in the United Arab Emirates employed their knowledge and skills to stay safe during COVID-19, and utilized their critical appraisal skills in verifying public information on COVID-19. **Material and methods.** Forty-four undergraduate physiotherapy students were recruited for the study from health science educational institute in the Emirate of Abu Dhabi. One to one semi-structured interviews were conducted and, the data was analyzed using thematic analysis.

**Result & Conclusion.** The study found that during COVID-19, the students of physiotherapy were updated with the necessary information to understand the newly emerged virus. The participants played an active role in educating themselves and their families about infection control measures and maintained proper hygiene to stay safe during the pandemic. Additionally, participants were able to critically analyse information using the knowledge and skills learnt in their program. Moreover, hands on experiences incorporated with respiratory modules were particularly found to be useful for students, as they seemed to have acceptable and updated knowledge on symptoms of COVID-19, the mechanism of infection transmission and physiotherapy interventions. The study also highlighted the need to integrate more hands-on approaches to the current curriculum in order to meet the growing need for health care professional to combat the COVID-19.

## Key words:

COVID-19, Physiotherapy students, physiotherapy education, physiotherapy knowledge and skills, critical appraisal skills, family health

## Streszczenie

**Cele.** Celem badania jakościowego było sprawdzenie, w jaki sposób studenci fizjoterapii w Zjednoczonych Emiratach Arabskich wykorzystali swoją wiedzę i umiejętności, aby zachować bezpieczeństwo podczas pandemii COVID-19, oraz swoje umiejętności krytycznej oceny do weryfikacji publicznych informacji na temat COVID-19.

**Materiał i metody.** Czterdziestu czterech studentów studiów licencjackich na kierunku fizjoterapii z instytutu nauk o zdrowiu w Abu Zabi zostało zrekrutowanych do udziału w badaniu. Przeprowadzono indywidualne częściowo ustrukturyzowane wywiady, a dane przeanalizowano za pomocą analizy tematycznej.

**Wyniki i wnioski.** Badanie wykazało, że podczas pandemii COVID-19 studenci fizjoterapii otrzymali informacje niezbędne do zrozumienia nowego wirusa. Uczestnicy odgrywali aktywną rolę w edukowaniu siebie i swoich rodzin w zakresie środków kontroli zakażeń i utrzymywali odpowiednią higienę, aby zachować bezpieczeństwo podczas pandemii. Dodatkowo uczestnicy umieli poddać informacje krytycznej analizie, korzystając z wiedzy i umiejętności zdobytych w programie nauczania. Co więcej, praktyczne doświadczenia z modułami oddechowymi okazały się szczególnie przydatne dla studentów, ponieważ wydawali się oni mieć akceptowalną i zaktualizowaną wiedzę na temat objawów COVID-19, mechanizmu przenoszenia infekcji i interwencji fizjoterapeutycznych. Badanie podkreśliło również potrzebę włączenia bardziej praktycznego podejścia do obecnego programu nauczania, aby sprostać rosnącej potrzebie zwalczania COVID-19 przez pracowników służby zdrowia.

## Słowa kluczowe:

COVID-19, Studenci fizjoterapii, edukacja fizjoterapeutyczna, wiedza i umiejętności fizjoterapeutyczne, umiejętności krytycznej oceny, zdrowie rodziny



## Introduction

The COVID-19 infections are emerging respiratory viruses that are known to cause illnesses ranging from the common cold to severe acute respiratory syndrome (SARS) [1]. On January 30, 2020, the World Health Organization (2020) declared COVID-19 as a public health emergency of international concern [2]. Shortly after, the COVID-19 virus was officially declared to be a pandemic by the World Health Organization (WHO) on March 11, 2020. Astonishingly, during the first week of March, a devastating number of new cases were reported globally. As of September 20th 2020, WHO reported more than 3,062,459 confirmed cases across the globe and over 9,53,903 deaths had been reported [3].

During the COVID-19 pandemic, health authorities in several countries communicated with higher education institutions to prepare final years and interns of health science students to meet the fast rising demand of health care services during the pandemic. In the United Arab Emirates, the UAE health authorities asked students to stay prepared in case they had to volunteer during the peak rise of COVID-19 cases in April and May 2020 and to be on call in case of requirement.

The role of physiotherapists in the management of patients with COVID-19 was highlighted in a report released by the World Confederation for Physical Therapy (WCPT), as physiotherapy is beneficial in the respiratory treatment and physical rehabilitation of patients with COVID-19. Although a productive cough is a less common symptom 34%, physiotherapy may be indicated if patients with COVID-19 present with copious airway secretions that they are unable to clear independently [4].

WCPT guidelines included techniques for effective airway clearance, positioning, and mobilization with tailored exercise prescription. In addition, it also provided comprehensive descriptions of application and utilization of protective equipment and disposal of biohazards [4]. The principles of physiotherapy management provided in the guideline is in line with the current physiotherapy curriculum, so we believe that the students who completed the cardio-respiratory module and clinical placements should be able to understand and apply the techniques outlined in the guidelines with minimal supervision.

Infection control measures have been in place since the beginning of the COVID-19 pandemic and there are numerous awareness programs about infection control and staying safe at home for the general public. However, students of physiotherapy had gained sufficient skills and knowledge prior to the pandemic on infection control, taught through several courses within their program. Further, the students had implemented them during their clinical practice, giving them valuable experience. Since the pandemic, the information on COVID-19 is overwhelming, but not all of the information were from trustworthy sources and some were deemed to be contradictory. A few of the research-related courses taught in the physiotherapy program could be useful in critically appraising such information.

The present study explored how physiotherapy students of year three, four and five utilized the knowledge and skills acquired during the program to understand the pathology of COVID-19, methods of infection transmission and basic therapeutic interventions including mechanical ventilation, breathing exercises and airway clearance. Additionally, the study focused on their

skills to critically evaluate information published on COVID-19 and those issued in the media. Courses taught at the college, specifically physiotherapy for cardiopulmonary conditions, basic health sciences and critical appraisal were targeted in the current study.

Most published materials in physiotherapy during COVID-19 focus on guidelines for professionals and there are reports expressing the concerns in the discontinuity of clinical placements of students during the pandemic. There are some studies involving examining the knowledge of the virus among university students [5-6]. However, little has been published to explore physiotherapy students' knowledge and skills required to stay safe and healthy during COVID 19. Since physiotherapists have been key members in caring for patients with COVID-19, this study is the first of its kind in gaining in-depth insights into the readiness of students and how the curriculum has been preparing them to face a situation such as this pandemic.

The objectives of the current study are to explore:

How UAE physiotherapy students employed their knowledge and skills on themselves and their families to stay safe during COVID-19 pandemic.

How UAE physiotherapy students utilized critical appraisal skills in verifying public information on COVID-19.

What knowledge and skills learnt in the Physiotherapy undergraduate program have been beneficial in understanding the common symptoms, and therapeutic interventions of COVID-19.

## Materials and Methods

### Research design

This research explored the knowledge and skills utilized by physiotherapy students to understand the newly emerged COVID-19 virus and verifying information related to symptoms, measures for infection control and methods of transmission in order to maintain their own and their family's health during the COVID-19 lockdown through qualitative research. One-to-one interview focusing on the experience's participants rather than their individual characteristics was used in this research.

### Study subjects

By using convenient sampling, three cohorts of physiotherapy students were invited to take part in this study from one health-care educational institution. All the participants of this study were Year three, four & five students of physiotherapy who had successfully completed the core courses including musculoskeletal, cardiorespiratory, neurology and research methods. In addition, the students of year four and five completed a minimum of eight weeks (year four) and maximum of thirty-five weeks (Year five) of clinical placement. Forty-four students were interviewed before the data saturation was reached.

When the stay home policy was imposed, year three participants continued online courses but year four & five participants were engaged in online courses half of the time and the other half was spent preparing to volunteer for clinical practice as their clinical placements were suddenly paused. Some of the participants started their clinical placement in early-September but some are still waiting for their placements to start, as soon as the restrictions from COVID-19 are lifted and more placements become available.

### Interview guide

The interview questions consisted of pre-determined open-ended questions which were planned and prepared by the interviewers in their small groups of four or five. Although each group came up with slightly different interview questions, they were carefully reviewed by the researchers to ensure that the questions adequately focused on the main aim of the study. Appropriate probes were used during the interview to gain in-depth information.

### Data collection

The data collection for this study took place in the second and the third week of June. The interviews were conducted by Year 4 students of physiotherapy as a part of their research methods course. All the interviews were held in English, as the medium of teaching is English in this institution. All the student interviewers were given adequate training on data collection techniques, each interviewer conducted two semi-structured interviews. All the interviews were observed by their peers, who provided timely feedback. In addition, some of the interviews were monitored by the researchers, thus ensuring the quality.

A group email outlining the main purposes of the study was sent to all students by the researchers, inviting them to take part in the study. Eight students who had clinical placement experiences from year four and five were specifically invited to provide further in-depth interview to provide perception of their respiratory related knowledge and skills on management of patients with COVID-19. Those who consented to take part were randomly allocated to each interviewer by the researchers. The participants were contacted by the individual interviewers with the participant information sheet and consent form. The consent forms were signed by both the interviewer and the interviewee.

All interviews were held at a mutually convenient time via zoom and were all audio recorded. There were no reports on technical issues during the interview and all the interviews went as planned. As part of physiotherapy training, all students are trained on effective communication and interview techniques. Throughout the interview, the interviewers engaged the participants well by allowing the interviewee to speak and probed only when necessary and remained neutral of any biases.

Forty-four students of physiotherapy from two different campuses of one healthcare educational institution took part in the study. The first two aims (about the infection control measures taken during the pandemic and critical appraising skills) were explored.

### Data analysis

All the interviews were transcribed for the purposes of analysis. Three researchers independently reviewed, summarized and extracted the meaningful statements as codes from the interviews. The codes with similarities were grouped together to form themes.

### Ethical considerations

This study was reviewed and approved by Fatima College of Health Sciences Ethics Review Committee (No. INTSTF007PTY20).

All the participants signed the informed consent form and were given the option to tick if they are happy for their interviews and quotes to be used for future publications. In addition, each student interviewer was also given a choice to either accept or decline for the supervisors to use the data collected by them for publication. Only those interviews that had both the consents were used in this article.

### Results

A total of forty-four students of physiotherapy from Year three, four and five participated in the study. All the interviews were held via zoom and there were no technical issues or disruptions during the interviews. All the participants of the study were females, as this research took place in a female only institution. Three main themes emerged from the data with few further sub-themes within each theme. Selected quotes from the participants are presented below.

#### Theme 1: Stay safe measures during COVID-19

##### *Basic courses on infection control*

All the participants in this study completed several courses that covered the basic aspects of infection control. The participants were referred specifically to the basic health sciences (BHS) course, which is one of the college requirements taught to first year enrollees, that covered generic infection control procedures, transmission-based precautions, use of personal protective equipment (PPE), and strategies for preventing the spread of infectious disease to healthcare workers and patients. Students utilized these skills to protect themselves and their families during the pandemic.

##### *Clinical placement experiences & infection control*

Participants with clinical placement experience (4<sup>th</sup> and 5<sup>th</sup> year students) had the chance to strictly follow the infection control policies implemented in the allocated health facilities. Apart from using simple infection control measures while using scrubs, mask and gloves, for patients with hepatitis A, hepatitis B and other infective conditions, they had to take further infective control measures. During the placement, they had to protect themselves and teach the patients and their families the principles of infection control and hygiene etiquettes.

##### *Practical demonstration and supervision on family members*

All participants were living with their families during the lockdown period. The citizen and residents of the UAE were requested to follow precautionary measures, including staying home, wearing masks and gloves in the public areas and maintaining safe distances when curfew was not implemented. Most participants in this study believed that as health care professional students they have responsibilities in keeping their families safe and updating them with infection control measures. They were also a reliable resource when some of their close relatives were infected, as they reiterated to the other family members the recommended infection control protocols to prevent further spread of infection to the others in the family and to the wider community.



**Table 1. Theme 1: Key findings and supporting quotations**

Theme 1 – Stay safe measures during COVID-19	
Sub-themes	Quotes
Basic courses on infection control	<p>Oh, from what I have learned from the college, especially from BHS, I use my knowledge to give some advices, and ways for my family members to prevent the disease by telling them to wash their hands very often. And the correct way of washing hands, to make sure that the germs are out. Also, I advise them to have some distance if while talking to anyone outside of the house. Also as you know now, most of our parents who are working, I advise them every day to make sure that they wear their masks and their gloves and to make sure to clean their office and the area of working very often, and whenever anyone comes to their office also when they're coughing or sneezing to cover their mouth. and it's important also to monitor their health. And if they had any signs or symptoms, they should require any near hospitals or contact with anyone healthcare professionally. (P01)</p> <p>Because I took the BHS one and two, I have information and knowledge about infection control, like a hand hygiene using a sanitizer before going outside and a return to home and the also wearing, gloves, and a mask and how to get rid of it, like how to wear it and then how to remove it without touching the hands. Also cough etiquette. Like I should cover my mouth and nose when coughing and sneezing and the avoid the touching my eyes, my nose my mouth. And yeah, because there's like a gate for the pathogens (P02)</p>
Clinical placement experiences infection control	<p>So as I am a physiotherapy graduating student, I learned how to keep myself, and what are the infection control methods, and how I can apply this to the real life, and learn this from my experience in the clinical placement, so I was able to teach my family members and educate them with the right way to keep themselves hygiene and to prevent the infection spreading between the community in general (P26)</p> <p>I have received like proper infection control when I took the clinical placement, we were taught as well as in the college... the proper way of wearing mask, gloves and hand washing ... and that was very helpful for myself and my family (P37)</p> <p>During my clinical placement, I was also in inpatient and we had many cases of infections such as hepatitis A, hepatitis B, even sexually transmitted disease. So, we really used proper infection control. In such places so that no accidents would happen ... when this situation (corona) did happen, I already had prior knowledge of how to deal with it, how to deal with airborne diseases and droplet diseases. So, now I try to educate my parents and family the same way I did for patients - on regular, handwashing, wearing masks, gloves, just the importance of how to stay safe without getting infected. (P11)</p>
Practical demonstration and supervision on family members	<p>As healthcare professionals, we know much more about safety protocols and how to follow them diligently. So definitely it's not just now, but like I always tell my family, particularly not to go out unnecessarily and now, only if you need to go maintain social distancing as much as you can, and to definitely wear a face mask. Yes. whenever you go out to always be on the safe side and if you're outside, if it is needed to wear gloves, go ahead. (P08)</p> <p>Since I'm a fifth-year physio student, they really trust my word and I get to just telling them the importance of taking precaution and doing this process to prevent disease. They were skeptical at first, but after giving them like a talk on how this disease is spreading and how can we prevent it they will start following the procedures, like washing behind frequently wearing gloves and mask when they go out and keeping distance between other people and stay at home and not connecting (social distance) with other people with COVID-19 or those in contact with people with COVID-19. (P09)</p> <p>I talked to them about the good types of mask, when they are offered a mask on, to buy or something or where they are supposed to buy a mask like what kind of mask, who're supposed to use N95 vs the surgical masks, how important it is to put the blue layer on the outside if you are not sick, but the blue layer on the inside if you feel like you have any symptoms so you can</p>

Sub-themes	Quotes
	<p>protect the people around you. Also on how to dispose the gloves to take them off from the inside to the outside so you can avoid any touching of the outside of gloves to your hand to avoid any transfer of the viruses. Also of course I have explained a lot what airborne diseases are and how they can affect you or the difference between airborne diseases and droplet diseases. So, basically that you can't get the disease if someone is far away from you or is just breathing in front of you, you'll have to actually, like, the patient has to cough in front of you or sneeze or something. And then you have to touch those droplets and then you can get the disease. So yeah, the infectious part on how you can get the disease I have explained that a lot to my parents because you know basically our families are when it comes to these things, they just think that it's normal flu and you would get it if someone just is breathing in front of you. So, you have to explain everything (P21)</p>

## Theme 2: Research & critical appraisal skills

### Reliable resources – WHO and Government Releases

The participants of this study found that some of the information pertaining to COVID-19 available to public through social media and other sources were not always trustworthy. They relied on the information released from reliable sources such as WHO, UAE government health authorities and trusted newspapers. Being health professional students, they were aware of the importance of using trusted resources and were careful in implementing recommendations on both themselves and their families.

### Media – Overwhelming and not always trustable

Participants described that the information spreading on Instagram, Twitter, Snapchat and other social platforms were overwhelming and sometimes misleading. They thought that most of the information received through social media were people's

opinion or reflections of their experiences. As anyone could post information on these social platforms without any review processes, some participants believed that people used such platforms to advertise and promote products that claimed to detect, prevent or treat COVID-19 with no supporting evidence or proper approvals.

### Application of the learnt critical appraisal skills

The participants of this study were found to be utilising various research skills in appraising the information provided during the pandemic. The skills for searching from trustable sources, differentiating between grey and authentic literature, and critically appraising the information on COVID-19 were some of the skills utilized by the participants. In addition, some of the participants registered themselves to various online platforms that provided up to date information on COVID-19.

Table 2. Theme 2: Key findings and supporting quotations

Theme 2 – Critical Appraisal	
Sub-themes	Quotes
Reliable resources -WHO and Government Releases	<p>Yeah, so I do want to say that not all the information we see online is true. Okay. Some of them are false, they don't give vital information and I actually don't follow anyone, because I it's really important for one, if they are looking for information regarding COVID-19 to look for reliable sources. So, one of the reliable sources I follow is the "WHO": world health organization and the most known newspapers like Khaleej times or gulf news. So yeah, you read the information, you know, you get to know what's going on around the world and well, how you can better protect yourself and your family and your loved ones and how you can better enforce those safety protocols. So definitely that's, that's how, you know, you learn about a disease, you know, but just always assure you're going through the right places, because there's a lot of places online, which does not give you right information just by hearing it. It doesn't really make sense. (P07)</p> <p>Wrong information was spreading in social media about COVID-19 so I had to make sure that whatever I saw or read was right so I will go and search for updates from reliable and trusted sources of information like WHO, UAE ministry of health. (P18)</p>
Media-Overwhelming and not always trustable	<p>Of course, we have to be more careful in this condition because there are a lot of rumors, spreading in the media on Instagram, and Twitter on social media in general. So we have to be more careful and we have to make sure to take the source to take the news about this virus or this pandemic from the correct sources like WHO, and from the website of our government in the UAE like the Department of Health Center website, so they have the correct news and also they provide a community with the best knowledge and awareness to how to deal with this pandemic in the correct way. (P24)</p>



Sub-themes

Quotes

It was, the media that we have here, the local media was a little bit off, unstable, since it was a little bit, let's say, it was overwhelming, but regardless of what we have received from the local media, I was trying to stick to the basic news that I, that we got from the World Health Organization and other more trusted resources other than the local media that might have, like we can see the comments of the people and their impressions on the situation, so a lot of people watching the comments, or reading the comments on such things would panic even more, but understanding the chart and information given by the media and being calm about it made it better since a lot of people receive news and not really take it with a good heart and would be overwhelmed by it and panic so yeah trying to receive the information calmly and logically was the way how I analyzed it (P29)

Well, as, you know in this era, we can, everyone can post anything on social media, if it was Instagram, Snapchat, Twitter, and people can just say stuff without any evidence, in addition to that, many people do believe them, like, for example, I read a rumors that saying there is some herbal treatment for COVID-19 and one of the influencers once did promote or advertise for a machine that helps you detect if you have COVID-19 or not, and all of this is wrong because when you listen to something personally, what I do, I always ask what is your evidence, some people do back up there, what they're saying by studies, other than some people just, have an opinion, that's why it's important for us to look at these valuable/valid resources (P31)

Application of the learnt critical appraisal skills

So, what I have done is I've checked for courses that can benefit me. Uh, and I have come across Mohamed Bin Rashid university, uh, they were conducting an ambassadorship program on COVID-19 in which you get to enrolled ...to get correct information, you take a quiz and after that, you get to certificate...Oh, I got enough basic knowledge on COVID-19, and after that not panic about every news I get and try to take it logically and, uh, just spread awareness and spread, um, the idea and the information of how it's important to stay safe for us to overcome this pandemic (P05)

As a physiotherapy student who studied evidence-based practice of course at that time I know what's the correct like information from the non-correct one, and what's the evident one. So, I would always listen to an evident information so I will choose for example World Health Organization or an evident (reliable) website and WHO is one of the examples (P35)

First of all whenever I hear like someone for example let's say tweeting about the COVID-19 on twitter so first role is not to believe anything unless it was backed by science or fact, so I always look for a sources that use evident based practice or evidence in general so whenever I am looking for information I try to find the websites that provide those evidence or provide facts with evidence and not just random people tweeting about it or random person just talking on the virus, I always go back into finding the proper evidence and analyse this evidence to make sure its trustable and I can actually benefit from it not just like random (P36)

### Theme 3: Knowledge and skills of respiratory system

#### *Understanding of symptoms and intervention of COVID-19*

All participants of the current study had completed basic health sciences courses in addition to the cardiopulmonary module, these courses provide students with the basic anatomical and physiological knowledge of cardiopulmonary systems, major classification of respiratory and cardiovascular disorders and prescribed therapeutic intervention. Students had to seek additional information to understand the newly emerged diseases, and they were able to relate other respiratory disorders to COVID-19.

They found that skills learnt during laboratory session were particularly beneficial to understanding the management strategies. Having the chance to practice with their peers and monitored by the instructors allowed them to get better

understanding of the recommended therapeutic techniques of COVID-19.

#### *Readiness for managing cases of COVID-19*

Participants believed that they have substantial knowledge around the COVID-19 including signs and symptoms, mode of transmission and therapeutic interventions. They had a clear understanding of the importance of positioning, airway clearance, breathing exercises and manual techniques for the removal secretion. However, most participants lacked confidence in applying these skills with COVID –19 patients. If the need arises, they said they may require a refresher course and with supervision, they should be able to manage patients. The participants reported the need for more practice, especially in clinical placements with larger numbers of respiratory patients, particularly those participants who had no ICU and/or respiratory experience.

**Table 3. Theme 3: Key findings and supporting quotations**

Theme 3 – Knowledge and skills of respiratory system	
Sub-themes	Quotes
Understanding of symptoms and intervention of COVID-19	<p>In case of understanding the virus, because you know the cardiorespiratory course we had learned about the human anatomy, specially the lungs and the heart, we had more information on the ventilation process and the use of mechanical ventilation like the different type of mask oxygen mask and all that as well as some air way clearance techniques like suctioning, positioning, breathing exercises, this help me understand what kind of approach might be good for people with you know COVID-19 (P36)</p> <p>I do have maybe more knowledge, you know, taking the cardiorespiratory course it helped me to understand the signs and symptoms of the diseases and also how bad (complications) they can be (patients with corona) in the future or if we didn't manage them (P37)</p> <p>I feel like mainly the respiratory system, the conditions that we covered, for example, pneumonia or a effusion, you know, just understanding what can go wrong in your respiratory system that can cause severe, symptoms or disability and sort of some sort I feel like, everything, including the lab sessions on handling the patient, along with having your anatomy knowledge (P38)</p> <p>The cardiorespiratory courses really helped me in knowing for example of course the anatomy, how the diseases will be transferred from one person to another. So yes it really helped me in knowing much more information specially understanding COVID-19 (P39)</p> <p>I have more knowledge now compared to other students who did not take cardiopulmonary physio courses in term of disease pathology, assessment and techniques for management. Additionally, I had two clinical placements where I had seen many cardio cases (P40)</p> <p>Practical sessions and OSCE exams with instructor notes taught me how to deal with similar cases because COVID -19 was not there at the time when we had these course, but I learnt techniques like airway clearance, manual percussion, positioning and breathing exercise, under the category of management of airways diseases (P40)</p>
Readiness for managing cases of COVID-19	<p>So, as I said before dealing with a patient with COVID-19 could also mean they might require some physiotherapy and some of the practical skills that we learned like passive mobilization exercises, we did a lot of airway clearance techniques. So, I think those skills would help me a lot of if I had a chance to deal with those people or patients like airways clearance techniques and different positioning... understanding mechanical ventilation, suctioning, all these might come in handy if you were dealing with those (patients with corona) people (P36)</p> <p>I think the college covered the theory part perfectly, but as I told you, theory is never enough specially that's where the dealing with real patients. So I think there is a lack of practice maybe or hands-on. Although we have lab classes, but I told you there are not really that's enough, by the end, we were practicing on models and on each other's as to many. Yeah. I prefer as we can practice during the cardio system, not after we finish all the theory stuff, just go to the clinical. I prefer if we can go during the semester because also in the clinical practice. I don't think that all of the students will have the opportunity to deal with cardio patients. It depends on the hospital and the educator. Not everyone will allow you to just deal with them (P37)</p> <p>I would feel more confident because studying the course for cardiopulmonary and having that, you know, appropriate knowledge. I can now guide my patients as well as the treatment session and try to get them motivated to do some exercises, to just help them at least give them some hope or positivity to spread some positivity among them since the symptoms could be very severe (P38)</p> <p>Yes of course, practical like, in knowing more about cardiorespiratory courses has given me more confidence especially when it comes to practical skills and when seeing a real patient. of course, especially when I see a progression in that patient, good progression of course this will give me great confidence in myself that I'm able to do this. (P39)</p>



## Discussion

This qualitative study was conducted to explore the knowledge and skills of physiotherapy students about COVID-19. The interview conducted with forty-four physiotherapy students enrolled in a healthcare institution in Abu Dhabi, United Arab Emirates. Three major themes with sub-themes emerged from this study. The main themes were stay safe measures during COVID-19, research & critical appraisal skills and knowledge and skills of respiratory system.

The infection control measures are basic and critical to all healthcare students and professionals. Washing hands, hygiene etiquette, and the proper use of PPE were integrated into the participants' physiotherapy training through certain taught courses and further hands-on training was received during their clinical placements. Such continuous training throughout the undergraduate program is crucial for improving knowledge, attitude and compliance) [7]. The participants of this study reported to be competent in utilizing all infection control measures on themselves as advised by health authorities. Being a good educator is one of the critical competencies of physiotherapy and the proficiency for the participants were developed through the regular engagement in community activities and clinical practice. Individual supervision and tailored techniques have shown to increase adherence to handwashing) [8]. This was evident in our study as the participants reported to have taken pro-active role on educating their family about infection control with tailored hand-hygiene activities.

Most studies conducted on evidence-based practice on undergraduate healthcare students focus on teaching research methods and appraisal skills [9] and on medical students with very little focus on physiotherapy students [10]. The amount of information on COVID-19 has been overwhelming and with some contradicting and confusing information on the media, this study found that the students were able to differentiate between trustable and non-trustable sources. All the participants of this study have undergone extensive training during their study on searching for literature from reliable sources, appraising and synthesizing information, integrating evidence-based practice in the real world during their clinical practice and case-based learning. With such intensive training, particularly profession-oriented learning of evidence-based medicine was found to enhance critical appraisal skills of medical students) [11]. Further, all participants of this study have conducted systematic reviews as a part of their research methods. Learning research skills and applying EBP during the clinical practice is critical and was supported by the social cognition theory for adopting health promotion in the real world [12].

Most participants of this study were engaged in conducting research relevant to physiotherapy during COVID-19. This necessitated them to engage in relevant published literature and we believe that they were up to date with the published and on-going research on COVID-19. Through their data collection, the participants gained insight

into the experiences of their peers and their families such as changes in the family routine, musculoskeletal conditions due to restricted movement during the lockdown, physical and activities at home. So, we believe that this multifaceted process of teaching, learning and assessment throughout the physiotherapy training has made them capable enough to deal with the information during this pandemic. Our findings concur with other research studies [13-14], where the knowledge, attitude, skills and behavior on EBP develop steadily and slowly when students move from theoretical learning to apply it in clinical practice.

Respiratory module is one of the core subjects taught in the physiotherapy program and is highly relevant to the current situation of COVID-19. The symptoms and interventions of respiratory problems in patients affected with COVID-19 are similar to some of the infective respiratory conditions. The participants were taught in detail about the symptoms, assessment and interventions of various infective lung conditions. This knowledge enabled them to easily understand the pathophysiology of COVID-19. The skills learnt through the practical and clinical placements was reported to be very useful for students and this made them feel prepared to handle cases of COVID-19. With the experiences of SARS and now COVID-19, much more emphasis must be given in the curriculum to community acquired conditions. However, the confidence in treating patients was the main issue due to insufficient hands-on experience in their clinical placement. So, the practical sessions provided in the institution can only serve to prepare them for real-world, but confidence will only be gained through their exposure to the patients. The importance of experiential learning is emphasized in our study and also in other studies [15-16].

## Conclusion

During the times of uncertainty, it is vital to prepare physiotherapy students adequately with the knowledge and skills to care for patients with COVID-19. The current physiotherapy undergraduate curriculum provided adequate knowledge and skills to actively involved in educating themselves and their families to stay safe during the pandemic. However, this study highlighted the need for integrating hands-on skills within the undergraduate curriculum in an explicit, organized, and systematic manner to prepare students well to practice on real patients and protect themselves from clinical hazards. Furthermore, physiotherapy students should be encouraged to participate in public health campaigns and other national health initiatives to enhance their skills to work within a team. Since clinical practice was temporarily suspended for the 4th and 5th year students during the pandemic, further follow up studies should be conducted to explore the utilization of the acquired knowledge and skills during their future clinical placements.

This study included only female participants and from one educational institution, so more demographical diversity can provide further insight. This was just a one-off interview with multiple participants during the COVID-19

pandemic, so a longitudinal study including post-pandemic results will be useful.

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