



Assessing the effectiveness of synchronous online training to occupational therapy students in teaching hands-on skills

Abstract

This research was conducted to evaluate the efficacy of teaching Kinesiotaping to novice OT students through an online platform and to determine whether Kinesiotaping skills can be taught/learned and assessed without direct face-to-face interaction.

Most literature relevant to this study was very scant, including reliability and valid Kinesiotaping competency evaluation, and most importantly there was a lack of concrete normative data for what constitutes acceptable “Kinesiotape skill level.”

Because of lack of research in this area the researcher, and 8 OT students, developed Kinesiotaping Competency Evaluation based on best available practice guidelines. The researcher surveyed a pool of certified KT practitioners to establish the normative data for the time needed to complete a basic KT protocol and the acceptable level of competency when teaching basic KT protocol.

Students were evaluated using two basic domains: Communication and Procedure. The Communication Domain consisted of an introduction, client confirmation, a brief explanation of the procedure, identification of any application precautions and/or contraindications, and obtaining client permission. The Procedure Domain consisted of skin preparation, tape preparation, the accuracy of kinesiotaping steps performed, and client education, and the time it took for students to perform the taping protocol.

The overall mean performance score was 36 out of 39, ranging from 26 to 39. The time to complete the space correction task ranged from one minute 39 seconds to 15 minutes, with an average completion time of 6 minutes 4 seconds, compared to 1 minute, per strip of tape, the average time it takes a Kinesio tape expert to complete a basic protocol, according to a separate survey completed by the researcher.

The mean for the communication subscore for video A was 10.14 out of 12. The lowest communication score was 0 out of 12 and the highest communication score was 12/12 (proficient communication). The mean for the skill subscore for video A was 25.86 out of 37. The lowest skill score was 22 out of 27 and the highest skill score was 27 out of 27.

Keywords: occupational therapy , synchronous education, kinesiotape

Introduction

Kinesiotape® was developed by Dr. Kenzo Kase in 1979 to act on the skin and fascia to support the body’s process of healing reducing “stagnation of lymph and improves lymph circulation and blood flow” to reduce pain in between clinic visits. Kinesiotape has been used to relieve pain, provide mechanical correction, increase range of motion and improve muscle contraction the practice of Kinesiotape has been historically

used as both a preventative measure and as an intervention strategy for a variety of settings and diagnoses, and its use has been widespread among medical professionals in last few decades [1].

There is lack of research regarding the delivery of Kinesiotape through an online platform. The teaching of Kinesiotape skills may be offered through distance learning to novice practitioners and students, especially with the sudden shift to online learning due to the pandemic caused

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by the novel Coronavirus Disease of 2019 (COVID-19).

The purpose of this research was to assess the efficacy of teaching Kinesiotaping to novice students through an online platform. It seeks to discover if the skills required to apply Kinesiotape accurately and reliably can be learned without direct face-to-face interaction. This study is significant to the field of occupational therapy as Kinesiotape can be used to increase functional abilities of patients during their Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs), improve their overall quality of life, and support participation in meaningful occupations. Kinesiotape has been shown to help with chronic non-specific low back pain as “significantly greater reductions in disability and pain were obtained immediately after treatment by the participants who received genuine Kinesiotaping than by those who received a sham application” [2]. By reducing pain and discomfort, the occupational therapist will be able to work with the client more effectively and efficiently using Kinesiotaping leading to improved functional performance and improve overall quality of life.

Clinical education has evolved over last decades with the advent of technology; this revolution created new ways to help students and clinicians to develop both basic and advanced clinical skills. This education ranged from the use of multimedia in the place of in person lectures to using virtual reality surgical procedures in place of older dry lab simulations. A 2010 study evaluated the impact of video-based learning versus traditional lecture learning on students at Brunel University. The results of this study suggested that use of video lectures was just as effective as in-person traditional lectures, in postgraduate education [3]. Subjects of the study also reported the use of videos had a positive impact on their motivation and ability to concentrate. Video instruction has also been used to educate students on clinical procedures in place of live demonstrations [4]. Teaching the technical skills used to create effective orthodontic hardware requires precise and accurate instruction. The use of procedural videos has been found to be effective in educating dental students on the process of fabricating hardware. When comparing the scores of students who participated in live versus pre-recorded video instruction, no statistical significance was found in the creation of the Adam’s clasp; common appliance. These findings are significant because it allows students to have access to repeated forms of instruction, while meeting the standards for clinical practice.

Following the COVID-19 pandemic, the use of online platforms has significantly increased and there is a greater need for research regarding the use of video instruction in teaching various procedures, such as Kinesiotaping methods. According to the ability for students to re-watch videos allows them to work and learn at their own pace outside of class or lab time. It also allows them to clarify steps they may have forgotten from the first time they watched it. In addition, studies have proven that video and online platforms can be effective teaching methods in various settings; however, there is a need for more research regarding the use of a video when teaching how to successfully apply Kinesiotape [5].

The purpose of this research was to assess the efficacy of teaching Kinesiotape to novice OT students through a synchronous online platform. This research project adhered to quantitative research methodology, using a convenient sample of second year OT students.

■ Research questions

Are novice OT students able to accurately and efficiently learn and apply kinesiotaping solely through a virtual platform?

Can the application of kinesiotaping completed by novice OT students be evaluated accurately virtually?

The students will be assessed on their accuracy in applying Kinesiotape techniques and rated by a Certified Kinesiotape Instructor. Kinesiotape classic will be used as its lighter adhesive is hypoallergenic and latex-free, making it appropriate for all populations.

Literature Review

An in-depth review of current literature regarding kinesiotaping was conducted to guide this research. The research is concerned with the efficacy of teaching Kinesiotape through an online platform, an extensive review of current literature was conducted regarding different forms of education and how people learn virtually vs face-to-face instruction.

Investigated the effects of two adhesive tapes with a non-tape intervention on the muscular activity of the fibularis longus during sudden inversion movements in male athletes. In one of the most common injuries, an ankle sprain, usually due to inversion, the fibularis muscle plays a key role. Each of the 51 participants were tested under the 3 conditions of nonelastic sports tape, Kinesiotape, and no ankle tape. Overall, Kinesiotape was shown to be effective in

preventing inversion ankle sprains with providing more stability, but did not alter the muscle activity in comparison to sports tape. Sports tape was seen to enhance muscle response by maintaining greater levels of muscle activation, while providing less stability and while no tape was used, lower levels of muscle activation and stability as a whole was reported. This provides insight as to how Kinesiotape can be useful for specific conditions, such as injury prevention as opposed to muscle activation, where nonelastic tape was superior, although more research is needed [6].

He investigated which conditions short-term Kinesiotape can be useful for in addition to previous research found on the effectiveness of using this agent with musculoskeletal conditions. Considering the success seen particularly in trunk and shoulder pain, they suggest Kinesiotape can be beneficial in treating pain and cervical ROM related to Whiplash-Associated Disorders (WADs). A randomized controlled study was conducted in which participants with acute WAD in the experimental group received appropriate taping with tension applied to the cervical spine, and the control group with the same condition received “sham” taping in which no tension was applied. The results exhibited that the experimental group demonstrated a greater improvement in cervical ROM and decrease in pain both immediately post taping and at the 24-hour follow up. However, although statistically significant, these improvements were very small and may not be clinically meaningful. These researchers indicated that further investigation is needed to evaluate the outcomes with long-term use of Kinesiotape as well as the inclusion of other interventions [7].

He investigated the effects of Kinesiotape on pain, ROM, and functional status in patients with osteoarthritis in the knee. Through a randomized control study in which all participants had osteoarthritis in the knee, each was assigned to an experimental, Kinesiotape group or control group, sham-Kinesiotape group. Clients were measured on various assessments including the visual analogue scale, ROM screening, Time up and go and a 6 minute walking test within 72 hours post taping. The results of this study showed significant differences between groups, with the experimental group demonstrating greater improvements at the 72-hour mark. This research provides evidence of the successful use of Kinesiotape for improving function and pain in patients with osteoarthritis in the knee. They provide recommendations for further research to include longer periods of use, as well as other

therapeutic options for interventions while using Kinesiotape [8].

He conducted a randomized control trial to determine the effects of Kinesiotaping on chronic, non-specific low back pain with different tapes and the application of different techniques. Participants were assigned to 3 groups: Kinesiotape with tension in the erector spinae muscle region (KTT), Kinesiotape with no tension on the same region (KTNT), Micropore® tape group in the same region (MP), and a Control Group (CG) which did not receive any intervention. Each participant was re-evaluated on pain, disability, ROM, strength and electromyographic amplitude at the 3-day mark and the 10-day mark. Overall, the study showed reduced pain in both Kinesiotape groups after 3 days, showing no difference between the use and nonuse of tension, but disability was only shown to improve in the KTT group after 3 days and 10 days. ROM, strength and EMG activity was not seen to be affected through these taping measures. The MP group showed improvements in these areas, although not a clinically important change whereas Kinesiotape was, with more than 30% improvement shown.

Adult learning differs from youth education in numerous ways, with the main difference being experience. Since adult learners have many more years of experience behind them, they are more capable in determining their unique goals of their educational activities [9]. This includes knowledge on the learning strategies that are most effective for them, the setting(s) in which they learn the best, understanding when a certain educational strategy is not working for them, and what they plan to do with new knowledge once it is learned. Constructs of Bloom's taxonomy can be adjusted to revolve around digital technology since it has increasingly become a modern reality of education.

Bloom's hierarchy of learning includes three main areas of educational activity. The cognitive realm deals with gaining knowledge, affective relates to increasing motivation and self-esteem, and psychomotor is aimed at developing motor skills [10]. Teaching Kinesiotape to adult learners will include all three of these critical areas, but it is essential to consider the psychomotor learning which takes place through a virtual online context.

Virtual learning has increased in use and presents numerous demands not previously required by both the students and the instructors alike. First, lack of face-to-face contact requires an increase in flexibility, technological competence,

responsiveness, communication skills, and informative feedback. Roddy et al. also greatly emphasized the importance of effective asynchronous communication as physical interaction and immediate feedback is nearly nonexistent (2017) [11].

Several other barriers present themselves when utilizing virtual education. These difficulties may include technical difficulties, lack of motivation, effective time management, change of routine, and work and family commitments. Some of these factors may be combated when a virtual educational context is anticipated and planned for, but several of these barriers exist for students currently completing online courses due to the abrupt switch of education mediums caused by COVID-19. Thus, instructor and learner readiness for virtual learning may be a high indicator of its success.

On the other hand, there are various advantages to virtual learning as well. First, virtual education provides more opportunity as those who do not have convenient access to campuses are able to access education from a distance [12]. Furthermore, this method of education has been commended, for not only its convenience, but also its flexibility and cost effectiveness.

While not much research has been done specifically on teaching Kinesiotape virtually, there have been numerous studies on the use of online technology to teach individuals within the classroom. A study by Giles et al. (2018) looked at the impact of using different styles of online teaching on satisfaction and learning in occupational therapy students. Specifically, students were taught goniometry measurements through two different methods of delivery: live lab recordings and short module videos. Students reported positive effects on their exam scores and feelings of preparedness when using module videos. "These results highlight the fundamental impact of video length, accessibility, and interactivity on the success of video as an educational modality" [13]. Faulconer et al. (2018) compared the effectiveness of online education methods versus traditional face-to-face classes in an undergraduate physics course by looking at failure rate, grade distribution, and withdrawal rates across various learning modes. The study found that failure rates were lower in online learning modes compared to in-person classes and a higher number of grade A were seen in the online or synchronous video classroom. However, withdrawal rates were lower for students taking in-person classes, most likely due to visible peer support in a traditional classroom [13].

Along with looking at the various methods for online learning specifically in the classroom, there has been some further research conducted to look at the use of a video recording to teach technical skills and procedures within the medical field. A study by Cardoso evaluates the effects of using a video to develop the cognitive and technical skills needed for undergraduate nursing students to perform a clinical procedure. Students were taught the puncture and heparinization of Totally Implantable Central Venous Access Ports (TIAP) through a video instruction and assessed on their competency and performance. According to the study, video-recorded simulations allow individuals to simulate real life procedures under controlled conditions, which favors learning. The use of a video for TIAP puncture and heparinization showed increased cognitive knowledge in students and proved to be an effective teaching strategy [14].

Student performance can be measured in various ways including quantitative measures such as exam scores, grade distributions, failure rates, or number of errors made during a particular procedure, as well as qualitative data on the technique and quality of a performance as observed by professionals in the field. These measures are done to analyze how well students can display their knowledge and mastery of a particular subject after watching a video. In addition to assessing accuracy and performance of skills from a professional viewpoint, it is beneficial to examine the student perspective to see how students feel about their learning experience and how well they feel they are able to learn from video instruction. As a part of the study by Giles et al. (2018), students were given a survey on how they perceived their learning through video recordings. According to their answers, the use of short module videos showed positive results in student learning, including perceptions of preparedness and confidence during their exam. According to when evaluated on their learning experience, most students found it to be a useful strategy and would recommend the use of a video for future students. Student anxiety was measured and remained low, with no statistically significant difference between pretest and posttest [14].

It is important not only to look at how well novice students are able to learn the process of Kinesiotape by watching an instructional video, but also to look at how well experts are able to evaluate a student's application of Kinesiotape by watching a video of the student's demonstration. Little research has been done on the actual evaluation of a video recording

to assess performance or mastery of a skill. He discusses the use of video documentation during a live labor and delivery process to analyze the staff's technical and nontechnical skills during the procedure, allowing important problems to be detected. Video documentation allows for clarification and self-recognition of any mistakes or deficits made during the delivery process [15].

There are a few things to consider when evaluating a video recording to assess someone's technical skills, including the quality of the video itself and the ability to clearly see each step of the procedure to accurately judge performance. Therefore, it is pertinent that all steps of a procedure are seen when evaluating a video in order to get the most accurate analysis. One thing that can be done to improve video quality is to have the recording done by a professional. In the study by Cardoso et al. (2011), the video recording, voice recording, and final production were all done by an advertising expert, which ensured excellent video quality when reviewing the procedures [16].

Multimedia has become an important aspect of the curriculum for students throughout medical colleges and universities. As previously stated, this form of education allows students to visualize the technical skills needed to perform a wide variety of tasks related to patient care. Little research has been done, specifically assessing the use of multimedia as a tool for education with occupational therapy students. A pilot study was designed to compare face-to-face learning with DVD training for students demonstrating a hoist lift transfer (non-weight bearing, mechanical transfer system). An additional component of this study analyzed pre and posttest confidence levels for students in both groups [17]. The students' performance of the transfer was assessed using the Rapid Upper Limb Assessment. This tool was used to identify what level of risk was associated with the postural errors exhibited by students during the transfer. The results of this study indicated no significant difference in the student's ability to perform the hoist transfer. This indication suggests that video training may be used as a medium but not a replacement, to present skills training for occupational therapy students [17].

Students appear to receive multiple benefits from having access to video instruction. With the ability to repeat or slow down portions of instruction, students can control the speed at which they learn. This gives the student autonomy when directing their own learning. Another benefit found in video instruction is the

ability for the video to increase the development of psychomotor skills. Because students may have access to the video resource at another time, this ability to receive repetitive instruction aids in the retention of psychomotor skills. This retention of skills is important because there may be a large period of time that passes before the practitioner recalls on them in clinical practice [18].

In summary, Kinesiotaping has been proven as an effective therapeutic modality in treating various conditions and has been shown to provide positive improvements in pain, muscular strength, ROM, and function. Although not many studies have been conducted directly pertaining to education of Kinesiotape to OT students through an online platform, related studies were reviewed. According to the literature, students partaking in an online course were able to learn and perform well in their classes [19]. With regards to evaluating work virtually, it was shown to be possible, but with room for improvement. In relation to occupational therapy practice, Kinesiotape relates to major frames of references utilized by occupational therapists, including the biomechanical, neurodevelopmental, and rehabilitative frame of references, and may be used to reach the target goals presented by each frame of reference [20].

Method

A quantitative study consisting of a convenience sample of eight occupational therapy students and will be taught three different taping protocols [21]. The students will be assessed on their accuracy in applying Kinesiotape techniques and rated by a Certified Kinesiotape Instructor. Students self-selected to be in this research project, they had no previous Kinesiotape training, but possess basic understanding of human anatomy and kinesiology, and adequate ability to follow and execute visual, auditory and written instructions.

The professor who OT Faculty is teaching the course and the researcher, delivered an "Introduction to Kinesiotape" lecture to students via synchronous video education platform. Students have already received rolls of Kinesiotape, students were told about other materials they need to have ready for the online lecture. The two-hours long lecture was delivered via a synchronous live demonstration session, which included breaks for questions and answers, and times when the students were expected to demonstrate skills that were just covered by the professor [22]. The lecture covered the benefits of the tape, its history, indications, and contraindication, students also learned how to

perform basic Kinesiotape processes and some specific treatment protocols [23].

A few days later MOT students carried out 2 Kinesiotape protocols on a volunteer, the taping process was videotaped and submitted for grading. Student performance was analyzed and graded by another Kinesiotape specialist, who was not involved with the initial training of students. This reviewer evaluated students on multiple parameters, and time to complete taping protocol, proficiency skills and communication with client. Skills included subset of tension, proper tape length/tension used, start anchor, end anchor, patient education and correct sequencing of Kinesiotape protocol. Students' proficiency was evaluated on scale 1-5[24].

Results

This research was conducted to evaluate the efficacy of teaching kinesiotaping to novice OT students through an online platform, and to determine whether Kinesiotape skills can be taught/learned and assessed without direct face-to-face interaction [25].

Most literature relevant to this study was very scant, including reliability and valid Kinesiotaping competency evaluation, and most importantly there was a lack of concrete normative data for what constitutes acceptable "Kinesiotape skill level"[26].

Because of lack of research in this area the researcher, and 8 OT students, developed Kinesiotaping Competency Evaluation based on best available practice guidelines. The researcher surveyed a pool of certified KT practitioners to establish the normative data for time needed to complete a basic KT protocol, and the acceptable level of competency when teaching basic KT protocol [27].

Students were evaluated using two basic categories of communication and procedure. The communication domain consisted of introduction, client confirmation, and brief explanation of procedure, identification of any application precautions and/or contraindications, and obtaining client permission. The procedure domain consisted of skin preparation, tape preparation, accuracy of kinesiotaping steps performed, and client education. The time it took for students to complete the Kinesiotape protocol was recorded (**Table 1**).

For video A which evaluated the first Kinesiotape protocol, the space correction protocol, overall mean performance score was 36 out of 39 possible points, with a range of 26 to 39. The time to

complete the space correction task ranged from one minute 39 seconds to 15 minutes, with an average completion time of 6 minutes 4 seconds. Kinesiotape experts take about 1 minute, per strip of tape, to complete a basic protocol [28,29].

The mean for the communication sub score for video A was 10.14 out of 12 with a range 0 to 12. The mean for the skill sub score for video A was 25.86 out of 37. The lowest skill score was 22 out of 27 and the highest skill score was 27 out of 27.

One student (student 4) did not complete video A; the space correction video assignment [30]. He/she submitted only video B, the muscle protocol video. The statistics for the space correction were calculated for seven video submissions only, omitting the video not submitted.

For video B, which evaluated the second treatment protocol, the muscle facilitation or inhibition protocol, the overall mean performance score was 35.75 out of 39 ranging from 26 to 39. The time to complete the muscle protocol task ranged from one minute 5 seconds to seven minutes 20 seconds, with an average completion time of three minutes 24 seconds [31]. Again, experts in the field, take about 1 minute, per strip, to complete a basic protocol, most students did space correction consisting of three KT Strips, which means that novice OT students, on average, took three and a half times as long for a muscle inhibition/facilitation protocol. The accuracy level that is acceptable by the experts was 90%, the muscle inhibition/facilitation Skill Score by novice OT students, was slightly above that, OT students' skills were at 92.0% on average [32].

The mean for the communication subscore for video B, the muscle facilitation or inhibition protocol was 10.5 out of 12. The lowest communication subscore was 0 out of 12, which implies the student did not introduce self to the patient, ask the patient's name for confirmation, explain the procedure to the patient, seek his/her permission, or ask about any precautions or contraindications[33]. The student who scored 0 out of 12 on communication for video A, is the same one who scored 0 out of 12 for communication at video B. The highest communication score was 12 out of 12 where the student communicated proficiently and thoroughly [34].

The skills subscore for video 2, the muscle facilitation or inhibition protocol, ranged from 23 out of 27 to 27 out of 27. The mean skills subscore was 25.25 out of 27. The average of total skills scores for both video A and video B was 71.75 out of 78. The lowest total score was

TABLE 1: Results.

	Video A_Space correction. Comm. Score X/12	Video A_Space correction. Skill Score X/27	Video A space correction_ Total score X/39	Video A_Space correction time to complete task. M:S	Video B_Muscle Protocol, Comm. Score X/12	Video B_Muscle Protocol, Skill Score x/27	Video B_Muscle Protocol Total score	Video B_Muscle Protocol time to complete task	Total A and B Skill Scores
Student 1	11	26	37	7:00	12	26	38	3:30	75/78 (96.2%)
Student 2	12	27	39	5:22	12	23	35	3:49	74/78 (94.9%)
Student 3	12	27	39	4:30	12	26	38	2:44	77/78 (98.7%)
Student 4	video missing - not turned in by student	x	x	x	12	23	35	3:35	35/39 (89.7%)
Student 5	12	27	39	3:22	12	27	39	2:26	78/78 (100%)
Student 6	0	26	26	1:39	0	26	26	1:05	52/78 (66.7%)
Student 7	12	26	38	15:00	12	26	38	7:20	76/78 (97.4%)
Student 8	12	22	34	3:30	12	25	37	2:46	71/78 (91.0%)
Average	10.14/12	25.85/27	36/39	5:46	10.5/12	25.25/27	35.75/39	3:24	71.75/78
	-84.50%	-95.74%	-92.30%		-87.50%	-93.51%	-91.66%		-92.00%
	Vid A comm	Vid A skill	Vid A tot	Vid A time	Vid B comm	Vid B skill	Vid B tot	Vid B time	Vid A & B tot
Mean	10.14	25.85	36	6:04	10.5	25.25	35.75	3:24	71.75
Mode	12	26.27	39	N/A	12	26	38	N/A	N/A
Highest	12	27	39	15:00	12	27	39	7:20	78
Lowest	0	22	26	1:39	0	23	26	1:05	52
Range	12	5			12	4	13		43

52 out of 78, excluding the student who turned in one video, and the highest score was 78 out of 78[35].

Discussion

The results of the study provide a better understanding of the effectiveness of online teaching and learning within the healthcare field. 7/8 students scored above the 90% required to be deemed competent; therefore, it is an effective method for teaching Kinesiotape online to novice occupational therapy students. Students scored slightly higher on space correction skills than muscle protocol skills indicated by an average score of 92.3% compared to 91.66%. This demonstrates a minimal difference in skill competence. Student 6 scored a 96.3% on application skills indicating the student is competent in the application (above the 90% cutoff), but was unable to effectively communicate which implies the student did not introduce self to the patient, ask the patient's name for confirmation, explain the procedure to the patient, seek his/her permission, or ask about any precautions or contraindications. Had the student communicated effectively, his/her

overall score would have shown competence, but given the lack of communication his/her overall competence score was only 66.7%. The researcher noticed when grading the Kinesiotape videos, that student 6 had completed some of the skills tasks before the video started recording (i.e. the tape was already cut, and edges were rounded). That same student scored 0/12 on the communication subscore. It is possible that he/she may have communicated with their client prior to starting the recording of the video which would explain the lack of observed communication prior to skills performance. In addition, despite showing competence in Kinesiotape skills, it takes 3 times longer (1 minute for experts vs 3.24 minutes for students) in taping compared to the average trained therapist which may be attributed to lack of experience, expertise, confidence, and/or hands-on education.

The results of this study build on existing research about the effectiveness of online education. Previous research has shown that virtual learning has positive results in student academic success. In addition, research by on the use of a video recording to teach a medical procedure (TIAP puncture and heparization) to nursing students

proved to be an effective teaching strategy which relates to the results of this study as an effective method of teaching Kinesiotape protocols.

Due to the small sample size consisting of 8 occupational therapy students, the generalizability of the results is limited. Further studies should be done in various professions to determine the effectiveness of online education regarding Kinesiotape application. Future research should include a larger sample size, independent raters of student performance, and a randomized sample of participants in various professions. In addition, the study consisted of one rater which does not allow for inter-rater reliability. The validity of the study may be impacted by rater bias, as the rater in this study was also the educator.

It is possible that after this has been further explored, examined, and shown to be successful in different populations, this outcome can positively impact future education. Online education in this regard could be provided to students, to professionals for CEU, certifications, demonstrations, and lectures.

Conclusion

In conclusion, the study shows that novice occupational therapy students were able to learn Kinesiotape protocols through an online platform and they were able to meet expected performance benchmarks as the students scored a 90% or above in the category of competency. This study proves the effectiveness of virtual learning as a means for clinical skills training in Kinesiotaping. Future research should be done with a larger sample size, increased variety of students from different schools, as well as additional reviewers. This will increase psychometric properties and generalizability to similar populations.

The limitations of this study were the small sample size which limits generalizability, and also having one rater meaning we had no inter-rater reliability, and lastly one student presented with an incomplete data set. Some considerations for future research include increasing the sample size and increasing the variety of students from different schools, as well as additional reviewers. It would also be beneficial to use a randomized sample from various professions and additional independent raters of student performance.

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