



Comparison of Turkish and English YouTube videos on phlebotomy in terms of content, reliability and quality

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ABSTRACT

Aim: This study was conducted to evaluate the content, reliability and quality of YouTube videos about phlebotomy.

Method: A retrospective, register-based study was conducted exclusively with videos publicly available on YouTube in June 2022. Ninety videos have been evaluated in terms of content, reliability and quality. This evaluation was performed by two independent researchers. The skill checklist created with reference to the WHO blood collection guide was used for the content evaluation of the videos. The short form of the DISCERN questionnaire was used to evaluate the reliability of the video. The quality of the videos was evaluated with a 5-point Global Quality Scale.

Results: The mean validity score of the English videos was 2.58 ± 0.88 , the quality score was 2.98 ± 1.02 and the content score was 8.78 ± 1.47 . In the Turkish videos, the mean validity score was 1.90 ± 1.27 , the quality score was 2.35 ± 0.97 and the content score was 8.02 ± 1.07 . The content, validity and quality scores of the English videos were found to be significantly higher than the Turkish videos.

Conclusion: Some videos do not include evidence-based practice and some videos contain technical differences as in the literature. In addition, in some videos, non-recommended techniques such as touching the cleaning area, opening and closing the fist were used. For these reasons, the results show that YouTube videos on phlebotomy are a limited resource for students.

1. Introduction

Laboratory tests are of great importance in diagnosing the patient, initiating and following various treatments and deciding whether to hospitalize or discharge from the hospital (McCall, 2021). The phlebotomy procedure, which is thought to be easy and therefore often ignored but a complex process, is a trauma factor for people (Reddy and Das, 2021). This process, which is not managed properly, can cause patients to experience discomfort, experience pain and many complications related to the procedure (McCall, 2021; Strasinger and Di Lorenzo, 2019). Especially individuals with long-term hospitalizations are exposed to these procedures every day, even several times a day (Coventry et al., 2019). This procedure, which can cause many problems

for the individual, should be carried out in the best way (Reddy and Das, 2021).

To prevent complications and perform the practice in accordance with the procedures, the health personnel who will perform this practice must be well-trained (Reddy and Das, 2021). It is especially important that students who learn a skill for the first time learn the practice from reliable sources. Teaching and demonstrating basic nursing skills is a critical aspect of nursing education. These basic psychomotor skills need to be taught effectively for nurses of the future to feel confident in providing patient care. Current teaching strategies in nursing education do not meet the needs of students while learning these skills. Because the current generation students live with technology and there is a lack of technology integration in nursing education. These students learn more

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by watching video materials and prefer to interact with technology more. This preference for technology and interaction makes traditional one-way teaching less attractive (Nicolaou et al., 2019).

Video-based resources will grow rapidly and demand more in the next few years. Videos will be the primary source for people to obtain information (Menziletoglu et al., 2020). Currently, online videos are widely used as an educational tool in health education. Videos enable student-centered teaching by providing flexibility in time, space and speed for the student to learn content. Students can access and repeat the videos multiple times. Repetition is of great benefit to students in learning complex operational skills and facilitates better observation of the practice (Srinivasa et al., 2020). The use of videos improves learning due to the improvement in the steps that focus on learning, seeing and maintaining a skill (Sawyer et al., 2015). The complexity of procedural skills is well suited to audiovisual input that divides the task into a cascading process (Srinivasa et al., 2020). The videos enable the student to understand each step of the skill practice before moving on to the next practice step (Sawyer et al., 2015). In a study to assess nursing students' perceptions of YouTube videos, all participants reported that accessing sample videos before learning the skills would better prepare students. The results of the related study show that students prefer YouTube videos while learning new skills and students feel more ready to learn. Moreover, in this study, YouTube was written as a potential way to increase skill acquisition and integrate technology into the nursing curriculum (Burton, 2022). However, videos on YouTube may contain insufficient or inaccurate information because they have not passed the evaluation process and their quality may be questionable because they are not regularly updated (Ranade et al., 2019). When the literature is examined, it is seen that there are studies examining the comprehensiveness, reliability and quality of YouTube videos on different practice subjects such as clean intermittent catheterization (Culha et al., 2020), breast self-examination (Esen et al., 2019) and pelvic muscle exercise (Culha et al., 2021). However, it was also written in the studies that the videos provided insufficient and low-quality information in terms of content (Osman et al., 2022). For this reason, it is thought that evaluating the content and quality of YouTube videos and examining whether the skill practices in the videos comply with the procedures will make an important contribution to the field. This study was conducted to evaluate the content, reliability and quality of YouTube videos about phlebotomy.

2. Methods

A retrospective, register-based study was conducted exclusively with videos publicly available on YouTube. In June 2022, a search was made on YouTube (<https://www.youtube.com>) with the words "kan alma" in Turkish, "phlebotomy", "blood collection" and "venipuncture" in English. Inclusion criteria: (1) The videos broadcast in Turkish and English, (2) videos demonstrating the phlebotomy on persons or models. Exclusion criteria: (1) The videos that only explain the subject without demonstrating phlebotomy, (2) the videos that include phlebotomy skills made on animals or non-model objects. During the scanning, a total of 496 Turkish videos were accessed. As 363 of these videos were irrelevant to the subject and 93 videos did not meet the inclusion criteria, they were excluded from the study and 40 Turkish videos were included in the study. In addition, a total of 551 English videos were reached and 449 of these videos were determined to be irrelevant to the subject, 52 videos did not meet the inclusion criteria and 50 English videos were included in the study. As a result, a total of 90 videos in Turkish and English were examined.

2.1. Evaluation of videos

All videos have been evaluated in terms of content, reliability and quality. This evaluation was performed by two independent researchers. The third researcher participated in the critical evaluation. Three

researchers are nurse academicians who hold a doctorate in fundamental of nursing. Each researcher provides training to nursing students on phlebotomy. In addition, they provide guidance to nursing students during practice, both in the sampling units and in various clinics. The first and third researchers are assistant professors at a local university. The second researcher is a professor at a local university. Inter-researcher compatibility was evaluated with the Kappa value. In addition, information about the time elapsed since the first upload, the length, the total number of views, likes and comments were recorded for each video.

2.2. Content evaluation of videos

The skill checklist created with reference to the WHO blood collection guide was used for the content evaluation of the videos (WHO, 2010). Accordingly, 11 items were created and the videos were evaluated in terms of these items. The "yes" answer for each item in this skill checklist was evaluated as 1 point (Table 1). Accordingly, the content of all videos was evaluated on a total score between 0 and 11. The higher the score, the higher the video content score.

2.3. Evaluation of the reliability of videos

The short form of the DISCERN questionnaire, which was developed by Charnock and Shepperd (2004) to evaluate written health information and adapted by Singh et al. (2012), was used to assess the reliability of the video (Table 1). In this form, the yes answer given for each item was evaluated as 1 point. The scores that can be obtained from the inquiry form are between 0 and 5. Videos greater than 3 in the DISCERN rating are quality videos and contain useful information. Videos with a score of 3 are considered moderate quality and require additional sources of information. Videos with a score of less than 3 should be considered bad quality and should not be used.

2.4. Evaluation of the quality of videos

The quality of the videos was evaluated with a 5-point Global Quality

Table 1
Tools used to evaluate the content, reliability and quality of videos.

	Yes	No
Content		
1. Hand wash/rubbing with antiseptic	1	0
2. Wearing gloves	1	0
3. Tourniquet use	1	0
4. Skin disinfection	1	0
5. Inserting the needle at the appropriate angle to the vein	1	0
6. Taking a blood sample	1	0
7. Opening the tourniquet without removing the needle after blood collection	1	0
8. Applying pressure to the area with cotton	1	0
9. Placing the sample in tube	1	0
10. Turn the tubes up and down slowly.	1	0
11. Take off gloves washing hands/rubbing with antiseptic	1	0
Reliability (DISCERN)		
1. Are the explanations given in the video clear and understandable?	1	0
2. Are useful reference sources given? (publication cited, from valid studies)	1	0
3. Is the information in the video balanced and neutral?	1	0
4. Are additional sources of information given from which the viewer can benefit?	1	0
5. Does the video evaluate areas that are controversial or uncertain?	1	0
Global quality scale (GQS)		
1. Poor quality, poor flow, most information missing, not helpful		
2. Generally poor, some information given but of limited use		
3. Moderate quality, some important information is adequately discussed		
4. Good quality good flow, most relevant information is covered, useful		
5. Excellent quality and excellent flow, very useful		

Scale developed by Bernard et al. (2007). This scale was developed to evaluate the information and video flow, quality, ease of use and usefulness of these resources on the website (Table 1). Whether the video digresses from phlebotomy, compliance with the practice steps algorithm and whether there are factors that would distract the audience were evaluated in the video flow. Accordingly, there are five items that evaluate the quality of the video in form (1: poor quality, 2: low quality-limited use, 3: somewhat useful, 4: useful, 5: useful-excellent quality). During the evaluation, the item that best expresses the quality of the video is selected.

2.5. Data analysis

SPSS (Statistical Package for Social Sciences for Windows, Version 22.0) was used to evaluate the data. Frequency (n), percent value (%), mean±standard deviation (Mean±SD) values were used for descriptive statistics. The normal distribution of the data was evaluated with the Shapiro-Wilk test and histogram. The Kappa value was calculated to determine the compatibility between two independent observers. Comparison between groups was analyzed by Independent Samples T Test and Chi-square test. The statistical significance level was accepted as $p < 0.05$.

2.6. Ethical consideration

Ethical principles were followed at every stage of the research. The names of the people or organizations that prepared the videos are kept confidential. In addition, ethical permission was obtained from the University Ethics Committee (2022/86).

3. Results

The Kappa compatibility value for DISCERN and GQS of two independent researchers was found to be 0.98. The mean publication time of the videos in English was 60.20 ± 45.11 months, the mean video length was 460.60 ± 400.58 s, the mean viewing rate was $703.010.0 \pm 1859164.35$, the mean number of likes was $3.513.04 \pm 6489.39$ and the mean number of comments was 145.04 ± 337.49 . On the other hand, the mean publication time of Turkish videos was 35.25 ± 25.69 months, the mean video length was 266.42 ± 232.50 s, the mean viewing rate was $51,140 \pm 80680.86$, the mean number of likes was 448.75 ± 797.69 and the mean number of comments was 47.75 ± 72.27 . It has been found that the mean publication time ($p < 0.01$), video length ($p < 0.01$) and the number of views ($p < 0.05$) and likes ($p < 0.01$) of the videos in the English are significantly higher than the videos in the Turkish.

When the videos are analyzed in terms of upload source, most of the videos in English (68 %) were uploaded on behalf of universities and professional organizations, while most of the videos in Turkish (70 %) were uploaded on behalf of individuals. In terms of this characteristic, there is a significant difference between the videos in both languages ($p < 0.01$) (Table 2).

Forty-four percent of the phlebotomy in English videos was performed on adult women and 40 % in Turkish videos on adult men. The phlebotomy was mostly performed from the antecubital fossa in both groups. When the English videos were evaluated in terms of practice; blood was taken with a vacutainer in 56 % of the videos, 6 % of them were hit on the area, 8 % were asked to make a fist and 2 % opened and closed fist repetitively. The skin was cleaned with circular motion in 72 % of them, the area was touched again after cleaning in 10 % and the skin was tightened and supported for application in 52 %. In Turkish videos; blood was taken with a vacutainer in 62.5 % of the videos, 7.5 % of them were hit on the area, 30 % were asked to make a fist and 27.5 % opened and closed fist repetitively. The skin was cleaned with a single motion from top to bottom motion in 50 % of the videos, the area was touched again after cleaning in 20 % and the skin was tightened and supported for application in 60 %. It was determined that there was a

Table 2
Characteristics of videos.

Video Characteristics	English Videos (n = 50) Mean±SD (Min-Max)	Turkish Videos (n = 40) Mean±SD (Min-Max)	p
Duration on YouTube (month)	60.20 ± 45.11 (6.0–178.0)	35.25 ± 25.69 (2.0–91.0)	0.002*
Video length (sec)	460.60 ± 400.58 (41.0–1935.0)	266.42 ± 232.50 (33.0–989.0)	0.008*
Total views	703,010.0 ± 1859164.35 (22.0–11283096.0)	51,140 ± 80680.86 (17.0–364256.0)	0.029*
Number of “likes”	3513.04 ± 6489.39 (0–28000.0)	448.75 ± 797.69 (1.0–3500.0)	0.004*
Number of “comments”	145.04 ± 337.49 (0–1629.0)	47.75 ± 72.27 (0–256.0)	0.077*
Analysis of videos by source of uploads			
Universities/ professional organisations	34 (68.0)	12 (30.0)	0.001**
Lecturer/health employee/student	16 (32.0)	28 (70.0)	

*Independent Samples t Test

**Chi-square

significant difference between the videos in terms of the needle/system used for blood collection ($p < 0.05$), making a fist ($p < 0.05$), opening and closing the fist ($p < 0.001$) and wiping technique ($p < 0.001$) (Table 3).

Table 3
Analysis of videos related to phlebotomy characteristics.

Characteristics	English Videos n (%)	Turkish Videos n (%)	p
Person/object from which blood was drawn			
Adult woman	22(44.0)	12 (30.0)	
Adult male	12(24.0)	16(40.0)	
Girl child	—	1(2.5)	
Boy child	—	—	0.336*
Model	12(24.0)	9(22.5)	
It is not clear	4(8.0)	2(5.0)	
Phlebotomy area			
Antecubital fossa	43(86.0)	38(95.0)	
Forearm	4(8.0)	2(5.0)	0.235*
Hand dorsum	3(6.0)	0(0.0)	
Needle/system used to phlebotomy			
Injector	14(28.0)	15(37.5)	
Vacutainer	28(56.0)	25(62.5)	0.028*
Butterfly needle	8(16.0)	—	
Slap the skin			
Yes	3(6.0)	3(7.5)	
No	47(94.0)	37(92.5)	0.777*
Make a fist			
Yes	4(8.0)	12(30.0)	
No	46(92.0)	28(70.0)	0.011*
Open and close the fist			
Yes	1(2.0)	11(27.5)	
No	49(98.0)	29(72.5)	0.000*
How to clean the skin			
Circular	36(72.0)	12(30.0)	
One motion from top to bottom	1(2.0)	20(50.0)	
Back and forth	11(22.0)	6(15.0)	0.000*
Bottom up	1(2.0)	1(2.5)	
Spray	—	1(2.5)	
No cleaning	1(2.0)	—	
Touching the area after skin cleansing			
Yes	5(10.0)	8(20.0)	
No	45(90.0)	32(80.0)	0.180*
Skin tightening			
Yes	26(52.0)	16(40.0)	
No	24(48.0)	24(60.0)	0.257*

* Chi-square

The mean validity score of the English videos was 2.58 ± 0.88 , the quality score was 2.98 ± 1.02 and the content score was 8.78 ± 1.47 . In Turkish videos, the mean validity score was 1.90 ± 1.27 , the quality score was 2.35 ± 0.97 and the content score was 8.02 ± 1.07 . The validity, quality and content scores of the English videos were found to be significantly higher than the Turkish videos ($p < 0.01$) (Table 4).

4. Discussion

Founded as a video-sharing site in 2005, YouTube has been frequently preferred as an educational tool and information source for people in recent years. YouTube has more than one billion visitors per month and contributes to the provision of health-related information on the internet (Tolu et al., 2018). When the videos are examined, it is seen that there has been a phlebotomy video in English on YouTube since 2007. Considering the number of videos uploaded from many countries in the English language, it is seen that the number of Turkish videos is quite high. It was determined that the mean publication time of English videos was 60.20 ± 45.11 months, the rate of viewing was $703.010.0 \pm 1859164.35$ and the mean publication time of Turkish videos was 35.25 ± 25.69 months and the rate of viewing was $51,140 \pm 80680.86$. The publication time of the English videos and the rate of viewing were significantly higher than the Turkish videos. Since English is a language used in many countries, it is an inevitable fact that videos in English can be broadcast from many countries and the audience will be that much.

The video length of the English language videos was 460.60 ± 400.58 s and the video length of the Turkish language videos was 266.42 ± 232.50 s. When the min-max values are examined, it is seen that the English language videos are between 41 and 1935 s, while the Turkish videos are between 33 and 989 s. It can be thought that the content of the videos will change depending on their length. However, the ideal video length to maintain a student's attention and participation in learning is about 7–10 min, that is, between 420 and 600 s. Prolongation of the time will lead to cognitive overload (Dong & Goh 2015; Frongia et al., 2016; Srinivasa et al., 2020). Although the mean length is seen within the specified period, it can be said that some videos are very short and some videos are very long.

When the content, validity and quality scores of the videos are examined, it is seen that the English videos have a moderate score and their scores are significantly higher than the Turkish videos (Table 4). This may be because most English videos are prepared by universities or professional organizations. Because the main criterion in the phlebotomy procedure is to perform the practice in accordance with the guidelines containing current evidence. It is thought that universities and professional organizations will practice by adhering to current evidence. In addition, it can be thought that this difference is caused by the fact that students shoot videos in Turkish videos.

Compliance with the phlebotomy procedure, which is one of the practices that should be done and taught by specialists, is very important in terms of preventing complications. When the literature is examined, it is the first choice location for venipuncture because several major arm veins lie close to the surface in this area, making them relatively easy to

locate and penetrate with a needle (McCall, 2021). In accordance with the literature, the antecubital fossa was used most in phlebotomy in both groups in the videos.

Another important point in phlebotomy is the application of a tourniquet to help locate and define peripheral veins. A tourniquet is a device that is applied or tied around a patient's arm before venipuncture to compress the veins and restrict blood flow. Restriction of venous flow distends or inflates the veins, making larger and easier to find and stretches the vein walls so they are thinner and easier to pierce with a needle (McCall, 2021). In all the videos included in the study, it is seen that a tourniquet was applied. However, it is recommended in the literature that these tourniquets should be disinfected frequently because they can be a source of infection. In addition, the tourniquet application time should not exceed 2 min (McCall, 2021). In general, there is no information about this in the videos. In addition, it was determined that 6 % of the English videos were hit on the phlebotomy area, 8 % were asked to make a fist and 2 % applied repeated fist opening and closing. In Turkish videos, it was determined that 7.5 % of them were hit the phlebotomy area, 30 % of them were asked to make a fist and 27.5 % of them applied repeated fist opening and closing. In a study by Eren et al. (2022), it was found that making fists increases vein visibility. A study was conducted by Aggarwal et al. (2022) to evaluate phlebotomy errors by direct observation of the sample collection procedure in a hospital. In that study, it was found that in 180 (90 %) of the cases, the patient was instructed to make a fist and 196 (98 %) patients were not asked to clench their fists repeatedly (Aggarwal et al., 2022). However, this exercise performed in phlebotomy may cause a partial increase in plasma potassium of approximately 1.5 mmol/l due to potassium entering the venous waste fluid from the forearm muscles. This occurs at all levels of plasma potassium (Farber et al., 1951). In addition, since the hemolysis rates in the blood taken with the injector are higher than the blood taken with the vacutainer, it is recommended to perform the blood collection with Vacutainer (Ceylan et al., 2022). More than half of the videos in both groups show that blood was drawn with a vacutainer.

Phlebotomy is one of the most frequently performed invasive procedures in both inpatient and outpatient institutions for many reasons (McCall, 2021; Strasinger and Di Lorenzo, 2019). There are some internationally applicable guidelines on correct phlebotomy procedures. However, when these references are examined, it is seen that the applications show technical differences (McCall, 2021; Carre et al., 2020; Simundic et al., 2018; Berman et al., 2022; Potter et al., 2021; Aksungar et al., 2015). As a matter of fact, these differences are also seen in the videos. It is found that 72 % of the English videos provide skin cleansing with circular motion and 50 % of the Turkish videos provide skin cleansing with a single motion from top to bottom. In addition, it was determined that there was a significant difference between the videos in both languages in terms of the cleaning technique (Table 3). There is no certainty in the literature about how to clean the area from which blood is drawn (Carre et al., 2020).

In 10 % of the English videos and 20 % of the Turkish videos, the phlebotomy area was touched again after cleaning. In the study conducted by Aggarwal et al. (2022), it was found that the phlebotomy area was touched before venipuncture in 160 (80 %) of the cases where blood was drawn. This may cause the spread of infection in the phlebotomy area and should not be done (WHO, 2010).

4.1. Limitations

The inclusion of only Turkish and English language videos is a limitation of this study. Another limitation is that there is no possibility of re-watching because some of the videos have been unpublished. Because people or institutions may discontinue broadcasting their videos or they may be updated their videos. The video link changes when the update is made.

Table 4
Analysis of videos based on reliability, quality and content score.

	English Videos Mean \pm SD (Min-Max)	Turkish Videos Mean \pm SD (Min-Max)	<i>P</i>
Reliability score of the videos (DISCERN tool)	2.58 \pm 0.88 (1–4)	1.90 \pm 1.27 (0–4)	0.004*
Quality score of the videos (GQS tool)	2.98 \pm 1.02 (1–5)	2.35 \pm 0.97 (1–4)	0.004*
Content Score	8.78 \pm 1.47 (4–11)	8.02 \pm 1.07 (5–11)	0.008*

*Independent Samples t Test

5. Conclusions

There are many YouTube videos about phlebotomy. Although many phlebotomy steps are shown in these YouTube videos, it is seen that some videos do not include evidence-based practice and some videos contain technical differences as in the literature. In addition, in some videos, non-recommended techniques such as touching the cleaning area, opening and closing the fist are used. For these reasons, the results show that YouTube videos on phlebotomy are a limited resource for students. In addition, in accordance with the WHO blood collection guide, two separate videos with Turkish but English subtitles and English but Turkish subtitles can be prepared and uploaded to YouTube. It should be emphasized that the video was prepared in accordance with the WHO blood collection guide.

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Ethical statement

The study was approved by the Erciyes University Ethics Committee (2022/86).

CRedit authorship contribution statement

Sevda Korkut: Conceptualization, Investigation, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Ayla Ünsal:** Methodology, Formal analysis, Writing – review & editing. **Ali Kaplan:** Methodology, Data curation, Formal analysis, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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