Test-Retest Reliability of Kinovea Software

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Abstract

The purpose of the current study was to test the reliability of the Kinovea 2D motion analysis software. To test the reliability of the software, test-retest method was used. 20 (N=20) subjects voluntarily participated in the study. All the subjects were well versed with the software and they had been using the software at least from last 1 years. As a testing protocol, the subjects were given a video of a runner and they were told to find the center of gravity of the runner during heel strike phase. To find the correlation coefficient using test retest method, Pearson Product-Moment Correlation Coefficient statistical test was used. The results of the study revealed that there is a very high correlation(r=0.781) between test and retest values which indicates that the software is highly reliable.

KEYWORDS: Reliability, Kinovea, Product-Moment Correlation Coefficient.

Introduction:

In the modern days, technology really helps us to reduce our efforts and saves our time. We don't have to sit the whole day with pen and papers to calculate the things manually. Now days technologies make it so easy that you can get the results by clicks of your mouse within a second. Software is such a technology which is now so much important for a researcher that without its support it may not be possible for the researcher to complete his research work. With the help of this technology you can easily draw out the analysis report or result within a friction of time which was not possible to do before. A software is a collection of instructions which, once directed, tells the computer to what to do. There are various types of software like Application software, System software, Malicious software etc. Among these software, Application software are used to perform day to day tasks like writing, calculating etc. Now days, in the field of sports science, specially in sports biomechanics you can't do your research if you don't have access to video analysis software. This kind of software are used to extract quantitative data from raw videos. This is an Application software and most of these types of software are expensive and are very complicated to operate. Though these kind of software are expensive in nature, they are highly reliable and they give highly accurate results. But because of their higher value they may not be easily accessible to common researchers. There are some alternatives to this problem. There are some software which are less expensive in nature or they are freely available. The only problem with these types of software is that their reliability are not mentioned or established. Kinovea is such a free software which is mainly used for 2D video analysis. It is one of the popular software because of its simplicity to operate and its features to measure most of the kinematic variables of any sports movements. Despite of its feasibilities and features, experts always doubt about its

reliability since nobody has established it before. Therefore, in the current study the researcher tried to establish the reliability of Kinovea 2D motion analysis software.

Material and Methods:

Selection of Subjects:

To test the reliability of the Kinovea 2D motion analysis software, 20 (N=20) subjects voluntarily participated in the study. All the subjects were from Sports Biomechanics Department of Lakshmibai National Institute of Physical Education, Gwalior. The subjects were having minimum of one-year experience of using the software and it was confirmed that all are well versed in using the software.

Test protocol:

The software can measure most of the linear and angular kinematic variables and among those variables the centre of gravity makes it distinguished from other low-cost software. Therefore, instead of testing all the variables, the researcher selected the variables Centre of gravity in order to test the reliability of theKinovea software. All the subjects were given a video of a runner and they were told to find the center of gravity of the runner at heel strike phase. To establish the reliability, test-retest method was used.According to test-retest method, the subjects were repeating the same test after a gape of one day. The test and retest data were acquired separately for every subject.The subjects were using the available pc in sports biomechanics laboratory in order to find the center of gravity using the Kinovea software.

Statistical analysis:

In test-retest method of reliability testing, the reliability coefficient is simply the correlation coefficient between the test and retest values acquired by the same persons. In order to find the correlation coefficient, the Pearson Product-Moment Correlation Coefficient test is used.The correlation coefficient is denoted by "r" and it always lies between -1 to +1. To relate the value of correlation coefficient with level of reliability, the table 1 can be used.

Table 1

Interpretation of level of reliability with reference to "r"

Value of "r"	Level of reliability
r <0.20	Lowest reliability
0.21< r< 0.40	Low reliability
0.41< r < 0.70	Moderate reliability
0.71 < r < 0.90	High reliability
0.91 < r < 1.00	Highest reliability

To find the test-retest reliability, Pearson Correlation Coefficient statistical test was used by means of SPSS software.

Results:

The table 2 shows the descriptive statistics of both the test. The similarity between both the test can be easily visible.

Table 2

Descriptive statistics

	Mean	Std. Deviation
Test value	1.1270	.01302
Retest value	1.1265	.00875

The table 3 reveals the Pearson correlation coefficient between test and retest values. It can be seen that, the value of correlation coefficient is 0.781 and it is significant at 0.01 level. Since the value of "r" lies between 0.71 to 0.90, it can be said that the reliability of the software is high.

Table 3

Correlation coefficient (r)

		Retest value
Test value	Pearson Correlation (r)	0.781 **
	Sig. (2-tailed)	0.000

**. Correlation is significant at 0.01 level

Discussion:

The present study can be considered as the evidence for the reliability of Kinovea 2D motion analysis software. The results of the study reveals that the software is reliable (r=0.781) and can be used for two dimensional motion analysis purposes. At thesame time the author also suggests for a further analysis with a bigger group of subjects. The result might have differed if a larger group had been selected for the study. The researcher is also concerned about the factors like experience level of the user and screen size of the computer system. Though the result of current study exhibits a high reliability of the software, the author concerns that bigger screen size might have increase the value of "r". Therefore, the researcher also suggests to analyzethe possible influence of these two factors on reliability of the software.

In conclusion it can be said that the Kinovea 2D motion analysis software is a highly reliable software for two-dimensional motion analysis. It is free and easy to use. It has all the features to find linear as well as angular kinematic variables. Therefore, it can be used by researchers in motion analysis purposes without any hesitation regarding its reliability.

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