

المراجع

- أولا : المراجع العربية
ثانيا : المراجع الأجنبية

أولاً: المراجع العربية :

- ١- حنان عبد الفتاح : التحليل الديناميكي لخطوه الحاجز في سباق ٤٠٠ م. ح، رسالة غير منشورة بكلية التربية الرياضية للبنات بالجزيرة ١٩٩٣م.
- ٢- جوهانس هيكالكمكس : نموذج التحليل الفني للحواجز (١٠٠ م حواجز للسيدات) ١٩٩١م - الاتحاد الدولي لألعاب القوى مركز التنمية الإقليمية - القاهرة ترجمة د. محمود فتحي محمود.
- ٣- دلال فج النور : العلاقة بين زمن الرجوع ودفع القدمين عند الانطلاق وأثرها على مرحلة تزايد السرعة في سباق ١٠٠م، رسالة دكتوراه غير منشورة - بكلية التربية الرياضية للبنات بالجزيرة ١٩٨٨م.
- ٥- سليمان على حسن : ديناميكية الأرتكاز، الطبعة الأولى القاهرة ١٩٦٤م.
- ٦- سليمان على حسن : ديناميكية الأرتكاز في العدو، مجلة التربية الرياضية السنة الأولى العدد بكلية التربية الرياضية للبنين الهرم القاهرة - جامعة حلوان ١٩٧٧م.
- ٧- سليمان على حسن : التحليل العلمي لمسابقات الميدان والمضمار، دار المعارف - ١٩٨٣م. احمد الخادم
- ٨- سوسن عبد المنعم وآخرون : البيوميكانيك في المجال الرياضي الجزء الأول، دار المعارف الأسكندرية ١٩٧٧م.
- ٩- شريف العوض : الخصائص الكينماتيكية لزوايه الرجل الضربه لصياغة تطبيقه لتعليم مهارة الرفسه الأماميه فى الكاراتيه، رسالة ماجستير - جامعة الزقازيق ١٩٨٥م.

- ١٠- طلحه حسين : الميكانيكا الحيوية، الأسس النظرية والتطبيقية دار الفكر العربى - الطبعة الأولى ١٩٩٣م.
- ١١- عبد النبي مغازى : العلاقة الديناميكية المصاحبه لخطوه الحاجز، رسالة دكتوراه غير منشورة- كلية التربية الرياضية للبنين بالهرم ١٩٨١م.
- ١٢- ليلى عبد الباقي : قوى رد فعل الأرض اثناء لحظة الارتقاء وعلاقتها بارتفاع مركز ثقل الجسم في الوثب العالى بطريقة فوسبرى ،رسالة ماجستير غير منشورة-كلية التربية الرياضية للبنات بالجزيرة ١٩٩١م.
- ١٣- ليف لينسون : أسس الميكانيكا التطبيقية- دار الطباعة والنشر موسكو - الاتحاد السوفيتى ١٩٦٨م.
- ١٤- محمد عثمان : موسوعة ألعاب القوى (تكتيك - تدريب - تعليم - تحكيم)، دار القلم - ١٩٩٠م.
- ١٥- نبيله احمد عبد الرحمن : العلوم المرتبطة بمسابقات الميدان والمضمار، دار المعارف - الأسكندرية - ١٩٨٦م.
- ١٦- هناء حسين رزق : القوه العضلية النسبيه للرجلين وعلاقتها بديناميكية الارتقاء فى الوثب الطويل، رسالة دكتوراه-كلية التربية الرياضية للبنات بالجزيرة ١٩٨٣م.
- ١٧- هارلد سميث : التسلسل الحركى للاعب فيلبس - اللاعب موزيس فى سباق ٤٠٠ م .ح ١٩٩١ الاتحاد الدولى لألعاب القوى مركز التنمية الإقليمية- القاهرة - ترجمة أحمد الخادم.

- 19- Haroled Smith : **Nevstudies in Athletic**, December 1990.
- 20- **Neaphats Secmey 14 400 meter. Hurdles.** p.p. 1991
- 21- James G. Hay : **The Bio Meejabucs of sports** 1977,
- 22- James G. Hay : **The Bio mechanics of sports techniques**, 2nd Fd
Prenlice Hallusa Englewond cliffs 1978.
- 23- Ralphmann and John : **Kinematic Analysis of olympic Hurdle
performance: Women's 100 Meters.**

**Department of Track and Field Events
Faculty of Physical Education for Women
Helwan University**

A Summary in English of the Thesis Research:

**“SOME OF KINEMATICS CHARACTERISTICS OF THE
WOMEN’S 100 - M. HURDLES”**

**Submitted by:
Mervat Ali Mohamed Mabrouk
Egypt Airways
to obtain M. A. Degree**

**Supervision
Dr. Nabila Essayed Mansour Fayed
Professor and Head of the
Department of Track and Field Events
Faculty of Physical Education for Women
Gyzero, Cairo**

1996 A. D. 1416 A. H.

KINEMATICS CHARACTERISTICS OF THE Women's 100 M. HURDLES

THE PROBLEM

100 M. Hurdles race needs specific kinematics characteristics to perform a complex movement task.

As a researcher, I noticed the poor performance of the Egyptian female Hurdlers of the 100m. hurdles, a great difference between the World record of 12.21 seconds and the Egyptian record of 14.4 seconds for the digital events, and their failure in performing with easy grace the three steps, especially the last three ones of the event, among hurdles that leads to the poor performance and inability to reach the World level. Therefore, I directed my attention to find out the reasons behind that and to investigate the **Kinematics Characteristics** of the best three elite female hurdlers of the Egyptian national team by filming and kinematics analysis of the third and eighth - hurdles steps.

THE PURPOSE

The purpose of this study was to examine the **Kinematics Characteristics** of the third and eighth - hurdles steps of the best three elite female hurdlers of the Egyptian national team, in an effort to better understand the reason for the poor performance and lower digital values of the woman's 100 m - hurdles. Thus the study was designed to examine:

1. The geometrical path of the center of the body mass gravity during step over the third and eighth hurdles.
2. the horizontal velocity of the center of the body mass gravity for the third and eighth hurdles.
3. The vertical velocity of the center of the body mass gravity for the third and eighth hurdles.
4. The desired outcome of velocity of the center of the body mass gravity for the third and eighth hurdles.
5. Step over-time computation for the third and eighth hurdles.
6. Take off-time computation for the third and eighth hurdles.

DESIGN OF THE STUDY

1- METHODS

The applied method was the descriptive approach by using filming and kinematics analysis to examine the kinematics characteristics of women's 100 m. hurdles on the third and eighth hurdles.

2- SUBJECTS

Three elite female hurdlers served as subjects of the study, intentionally selected from the national team. Each performed 4 trials of 100 m. hurdle at maximum speed. The third and eighth hurdles were filmed. During the pilot study, a hurdler was excluded because of injury, thus the subjects became only two.

3- TOOLS

A. Tools for Filming:

- 2 cine - cameras
- 2 triple stands for the cameras
- A measuring tape for the distance between the camera and hurdle.
- Multi-coloured tape of plaster.
- A scale.
- A coloured film.
- Legal hurdles.
- The track of Al-Maadi Olympic Center.

B. Tools for Kinematics Analysis

- A digitizer.
- A computer
- Programs for computing the Kinematics Variables.

CONCLUSIONS AND RECOMMENDATIONS

As to Velocity:

The horizontal value of the first player, during the stop-over of the third hurdle, increased, associated with a decrease in the vertical velocity value considered as an indicator of good performance.

The player velocity at the third hurdle was 7.22 m/s. At the eighth hurdle, the horizontal velocity of the first player was higher than the vertical velocity.

That was an indicator of the right performance but the velocity was too slow of 3.63 m/s.

- The horizontal velocity value of the second player increased during stop-over of the third hurdle, associated with a decrease in the vertical velocity value considered as an indicator of good performance because it is consistent with the movement. The velocity of the player at the third hurdle was 5.8 m.s. but it decreased greatly at the eighth hurdle to 3.37 m.s.

- The results demonstrated significantly greater velocities at the third and eighth hurdles between the Egyptian female hurdlers and hurdlers of the World Championship. Ex. Yourdinka Donkova, the World Champion of a record 12.38, Brigitte Wolf of Europe (13.8). Claudia Zadcuski of Germany (12.80)

TABLE 13

The velocity of the Egyptian female players on the third and eighth hurdles as compared to World Champion.

NAME	VELOCITY ON THE THIRD HURDLE	VELOCITY ON THE EIGHTH HURDLE	TIME
Rania Mohamed	7.22	3.63	16.02
Rania Abdel Aziz	5.8	3.37	16.04
Yourdinka Donkova	8.76	8.85	12.38
Claudia Zadlusi	8.50	8.33	12.08
Brigitte Wolf	7.87	7.87	13.07

The Wheel Results

As for the First Player on the Third Hurdle

The result indicated that the wheel value during starting position of taking-off was decreasing, but in flight phase it was increasing horizontally, then it started increasing and decreasing as a result of body-height resistance more than normal above the hurdle.

After hurdle phase, the wheel was increasing horizontally the falling was quickly at a maximum rate.

As for the First Player on the Eighth Hurdle

It was decreasing function and the vertical wheel greater than the horizontal one, in flight phase the wheels were fluctuating but in falling phase it was increasing vertically that the outcome was up not forwarded in the required direction of motor performance.

As for the Second Player on the Third Hurdle

It was increasing at the moment of push before the hurdle that meant muscle systole. At the flight phase the outcome tended vertically as an indication of poor performance because it was in opposite direction of the movement that made the player go up unnecessarily.

At the flight phase, after the hurdle it was decreasing as a result of collision by earth.

As for the Second Player on the Eighth Hurdle

The vertical wheel was greater than the horizontal one before the hurdle, but in the flight phase it was fluctuating. After the hurdle, it was increasing horizontally in the right direction.

As for the Time Performance

- The first player took more time to stop-over the eighth hurdle of 1.34 s., but she took 0.54 s. to step over the third hurdle; e.g. the difference was 0.8 s.
- The second player took 0.66 s. to step over the third hurdle and 1.26 s. to step the eighth hurdle, the difference was 0.6 s., although she was a junior player.

As for the Take-Off Time

- The first player took 0.22 s. to take-off the eighth hurdle and 0.10 for the third one with a difference of 0.12 seconds.
- The second player took 0.14 seconds to take-off the third hurdle and 0.18 s. for the eighth one with a difference of 0.4; Although she was a junior player.

RECOMMENDATIONS

1. A training program to be designed to develop velocity and endurance since training is an individual process.
2. More attention towards technique and specific programs regarding the sound performance for juniors.
3. Much attention towards the physical fitness programs because of the importance to keep fit.
4. A training program for players to make flight less and less during stop-over the hurdle and improve the take-off time.
5. A training program to maintain the required velocity before the hurdle and during the step-over.