



Effectiveness of Integrated Functional Exercises Program on Some Specific Physical Variables and the Performance Level of Some Movements in Modern Dance

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Abstract: The current research aims to designing an integrated functional exercises program and identifying its effects on some specific physical qualities (leg, back and abdominal muscles strength - leg, back and abdominal power – spine and legs flexibility – both types of balance – coordination – agility) and the performance level of some movements (all types of falls and getting up – contraction arch – free patterns of modern dance). The researcher used the experimental approach (two-group design) with pre- and post-measurements. The researcher purposefully chose (35) female students of the third year – Faculty of Education (physical education department) – University of Kuwait, who study the modern expression curriculum. Five students were excluded due to participation in sports teams. The researcher identified (8) students as a pilot sample leaving only (22) students as a main sample and divided them into two groups (11 students each). Results indicated that:

1. The recommended training program with integrated functional exercises had positive effects on all physical variables and the performance level of some movements and free patterns in modern dance.
2. There are statistically significant differences between the experimental and control groups on all research variables in favor of the experimental group.
3. Variance percentages on all research variables were higher for the experimental group compared with the control group.

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Key words: Integrated Functional Exercises – Jazz dance – Free Patterns – Modern Dance.

1. Introduction:

Modern Dance is a newly developed art. It is described as "modern" because it is connected to modern age through breaking all rules and traditions previously followed in Ballet with its distinct form. This type of motor expression didn't create a scientific way like ballet that was built upon the potential of performing a set of movement with specific difficulty. This type of performance took its modern form from the spirit, creative status and feelings of dancers in addition to creativity of each dancer when expressing his/her emotions and communicating them to others. Modern dance is an individual expression of the dancer... an argument on the artistic form that stems from dancing thinking, concepts and feelings.

Quoting Martin, Al-Azab, F. (1992) indicated that modern dance is based on each emotion that can be expressed through movements created by the dancer at the moment he/she feels these emotions. The main objective of modern dance is to link thinking and emotions via continuous body movements expressed according to the dancer's perspective (Al-Azab, F. 1992: 189).

Modern dance has several benefits as it leads to thorough and well-balanced development of all physical, mental, psychological and social aspects. It is distinguished from other types of dance by requiring no specific skills. Modern dance is based on natural movements that derive its significance and meaning from the spirit of dancer. Therefore, it improves aesthetic taste, self-expression and inner interaction of the human sole (Mohy El-Din, S. & Mohamed, S. 2002: 136 – 138)

Integrated functional training is a set of multi-level integrated movements. The difference between regular training and integrated functional training is that regular training uses external fixtures including fixed benches and chairs while integrated functional training uses the spine instead of depending on external fixtures as balance is a crucial element and a significant interactive characteristic of functional exercises.

Integrated functional exercises are suitable for all age groups regardless their training levels. It aims to improve the links among muscles and the nervous system. Muscular strength and balance are major

components in integrated functional exercises integration of muscular strength and speed produces muscular power or speed strength while integration of muscular strength and balance produces functional strength.

Ron Jones (2003) indicated that integrated functional exercises are considered as non-traditional modern methods of sports training (Ron Jones 2003: 12).

Maryg Roynalds (2003) indicated that regular exercises, especially on machines, depend on static performance while functional exercises don't require external machines and involve several muscle groups simultaneously (Maryg Roynalds 2003: 50-55).

Scot Gaines (2003) indicated that all training programs should include functional exercises proving his point of view by the fact that all athletes in various sports don't establish themselves on both feet equally line up but for very short periods. He also indicated that sports practiced from sitting position are very few like rowing. Therefore, regular exercises from standing or sitting positions are not suitable for most sports activities (Scot Gaines 2003: 32).

Michael Boyle (2004) indicated that functional exercises have three components. The first component is "Core Stability" as movements are performed with few repetitions and light to moderate intensity in progressive increase of performance to achieve stability and muscular nervous control in core muscles. The second component is "Core Strength" where dynamic movements using external resistance on all motor levels are used to achieve muscular strength and motor integration. The third component is "Core Power" where movements produce force and turn it simultaneously into speed (Michael Boyle 2004: 364).

Abd Al-Kalek, E. (2005) indicated that technical performance is related to specific physical and motor abilities as its mastery depends on improving requirements of performance. Performance level is evaluated through individual acquisition of specific physical and motor abilities. Abd Al-Maksoud, E. (1997) indicated that exercise affects working muscles and practically improves motor performance skills. Al-Nemr, A. & Al-Khateeb, N. (1996) indicated that performance improves significantly if training is more specific to the activity under practice as it includes major working muscles in this activity and enhances these muscles the same way it is being used in competitions (Abd Al-Kalek, E. 2005: 165) (Abd Al-Maksoud, E. 1997: 411) (Al-Nemr, A. & Al-Khateeb, N. 1996: 189).

As a lecturer of motor expression, the researcher noticed that students of specialty (third year) find it difficult to to perform some movement like landing, all types of falling and getting up, some percussive

movements like contraction arch in addition to the poor performance of free modern dance. This is because the motor performance is not sequential nor fluent enough to give the good impression while watching. Movements lose its aesthetics due to the student's inability to perform as she requires specific physical characteristics for good performance.

This may be due to the lack of leg, abdominal and back muscles strength in addition to the lack of other physical qualities like flexibility, agility, power, coordination and both types of balance. This led the researcher to design a recommended jazz dance program with integrated functional exercises and to identify their effects on some specific physical abilities and the performance level of some modern dance movements and patterns.

Through review of related literature, the researcher noticed that only few studies dealt with jazz dance and integrated functional exercises in sports, especially in motor expression. These studies include Ibrahim, E. & Khalifa, N. (1984), Nour El-Din, I. (1984), Al-Gaiar, M. (1987), Al-Demerdash, N., Nour El-Din, E. & Abd Al-Aziz, F. (1987), Abd Al-Aziz, E. (1998), Cress et al (1996), Yasumura et al (2000), Abd Al-Monem, D. (2004), Mari Jake et al (2004), Cymara et al (2004), Youssef, A. (2005), Kobayashi Ryuji (2006) and Christian Thompson et al (2007). These studies indicated that modern dance, motor expression and the recommended programs improve specific physical qualities of of motor expression in addition to improving technical performance. But none of them dealt with jazz dance nor integrated functional exercises and their effects on physical qualities and the performance level of modern dance. This is because these exercises are very recent as integrated functional training and jazz dance are somehow recent terms that appeared recently in the sports field with the aim of improving physical and technical performance in addition to injury rehab.

Aims:

The current research aims to designing an integrated functional exercises program and identifying its effects on:

1. Some specific physical qualities (leg, back and abdominal muscles strength - leg, back and abdominal power – spine and legs flexibility – both types of balance – coordination – agility)
2. The performance level of some movements (all types of falls and getting up – contraction arch – free patterns of modern dance).

Hypotheses:

1. There are statistically significant differences between the pre- and post-measurements of the

experimental group on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of post-measurements.

2. There are statistically significant differences between the pre- and post-measurements of the control group on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of post-measurements.

3. There are statistically significant differences between the pre- and post-measurements of the experimental and control groups on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of the experimental group.

2. Methods: Approach:

The researcher used the experimental approach (two-group design) with pre- and post-measurements.

Participants:

The researcher purposefully chose (35) female students of the third year – Faculty of Education (physical education department) – University of Kuwait, who study the modern expression curriculum. Five students were excluded due to participation in sports teams. The researcher identified (8) students as a pilot sample leaving only (22) students as a main sample and divided them into two groups (11 students each).

For data homogeneity, the researcher calculated skewness for all descriptive data (age – height – weight), specific physical qualities and performance level of collapse movements (all types of falls), getting up and contraction arch.

Table (1): Participants Categorization

Data	Experimental group	Control Group	Pilot Study	Excluded
Number	11	11	8	5
Sum	35			

Table (2): Descriptive Data for sample (n=30)

Variables	Measurement	Mean	SD	Median	Squewness	
Descriptive and physical variables	Age	Year	19.90	0.082	20.00	-1.21
	Height	Cm	161.25	7.47	161.00	0.10
	Weight	Kg	60.66	5.49	60.00	0.36
	Leg muscles strength	Sec/kg	63.63	15.99	65.00	-0.26
	Back muscles strength	Sec/kg	62.77	15.77	65.00	-1.16
	Abdominal muscles strength	Number	33.92	4.12	33.00	0.67
	Leg muscles strength	Cm	133.83	12.71	135	-0.28
	Back muscles strength	Sec	39.38	3.15	39	0.36
	Abdominal muscles strength	Sec	16.35	2.15	17.20	-1.19
	Spine flexibility	Cm	40.90	2.35	41.00	-0.13
	Thigh flexibility	Cm	19.75	2.29	19.25	0.66
	Static balance	Sec	2.72	1.17	2.39	0.85
	Dynamic balance	Sec	45.79	7.04	46.00	-0.09
	Coordination	Number	4.00	1.04	4.04	-0.12
Agility	Sec	10.94	0.83	11.00	-0.22	

Table (2) indicated that skewness values for all variables ranged from -1.19 to 0.70 (± 3). This indicates data homogeneity.

Table (3) indicated that skewness values for all variables ranged from 1.49 to -0.49 (± 3). This indicates data homogeneity.

After verifying homogeneity, (8) students were randomly chosen for the pilot sample while (22) students were divided into the two research groups (experimental = control = 11). Group equivalence was verified as seen in tables (4) and (5)

Table (3): Descriptive Data of Participants on the performance level of some movements and free pattern in modern dance (n=30)

Variables		Measurement	Mean	SD	Median	Squewness
Technical Variables	Circular fall	Point	2.83	1.15	2.26	1.49
	Getting up	Point	1.42	0.71	1.48	-0.25
	Back fall	Point	2.79	1.23	2.64	0.37
	Getting up	Point	1.35	0.60	1.41	-0.30
	Side fall	Point	2.95	1.84	2.73	0.36
	Getting up	Point	1.39	0.67	1.50	-0.49
	Contraction Arch	Point	3.95	1.82	4	-0.08
	Free Pattern of Modern Dance	Point	8.04	1.22	8	0.10

Table (4) showed no statistically significant differences between the two groups on all descriptive and physical variables under investigation. This verifies groups equivalence.

Table (5) showed no statistically significant differences between the two groups on the performance levels of some movements and free patterns of modern dance. This verifies groups equivalence.

Table (4): Difference significance between the experimental and control groups on descriptive and physical variables of research (N1 = N2 = 11)

Variables		Experimental		Control		Difference	(t)
		Mean	SD	Mean	SD		
Descriptive and physical variables	Age	160.64	4.72	160.18	5.98	0.46	1.92
	Height	61.45	6.55	59.55	4.66	1.9	0.75
	Weight	19.55	0.69	20.00	0.89	0.45	1.25
	Leg muscles strength	63.50	7.697	58.92	8.948	4.58	1.23
	Back muscles strength	65.58	1.43	57.25	1.74	8.33	1.83
	Abdominal muscles strength	33.84	3.74	33.91	2.78	0.07	0.05
	Leg muscles strength	138.73	2.82	132.18	2.38	6.55	1.16
	Back muscles strength	39.75	4.20	39.66	3.15	0.09	0.05
	Abdominal muscles strength	3.83	1.51	3.29	1.49	0.54	0.81
	Spine flexibility	42.50	3.35	42.90	2.25	0.04	0.03
	Thigh flexibility	18.87	2.65	19.12	3.11	0.25	0.19
	Static balance	4.53	2.60	3.92	1.57	0.61	0.64
	Dynamic balance	45.82	3.70	46.45	3.53	0.63	0.39
	Coordination	3.91	1.14	4.18	1.08	0.27	0.54
Agility	10.85	1.00	10.84	0.80	0.01	0.03	

(t) table value on $P \leq 0.05 = 2.07$

Table (5): Difference significance between the experimental and control groups on the performance levels of some movements and free patterns of modern dance (N1 = N2 = 11)

Variables		Experimental		Control		Difference	(t)
		Mean	SD	Mean	SD		
Technical Variables	Circular fall	3.65	0.96	3.55	0.74	0.10	0.26
	Getting up	2.14	0.84	2.16	0.86	0.02	0.05
	Back fall	3.35	0.84	3.39	0.77	0.04	0.11
	Getting up	2.06	0.79	2.09	0.72	0.03	0.09
	Side fall	2.67	1.11	2.50	1.05	0.17	0.35
	Getting up	2.10	0.82	2.15	0.91	0.05	0.13
	Contraction Arch	2.84	1.10	2.75	0.97	0.09	0.20
	Free Pattern of Modern Dance	7.15	2.45	7.00	1.75	0.15	0.16

(t) table value on $P \leq 0.05 = 2.07$

Data collection tools and tests:**Tools and equipment:**

- A restameter for measuring heights (cm)
- A medical balance for measuring weights (kg)
- A measuring tape for thigh and spine flexibility and leg power (cm)
- Stop watch for time (sec)

- A dynamometer for back and leg muscular strength (w/kg)
- Audiocassettes and recorder for the programs

Physical tests:

According to review of literature and experts' opinions, the researcher identified major physical abilities of modern dance. All abilities and tests having 80% or more of experts' agreement were included as seen in tables (6) and (7).

Table (6): Experts' opinions about Physical Abilities (n = 10)

Ability	Experts' Opinions
Muscular Strength	100 %
Muscular Power	100 %
Balance	100 %
Flexibility	90 %
Coordination	90 %
Agility	80 %
Cardiorespiratory endurance	50 %
Speed	40 %
Accuracy	40 %
Endurance	60 %

Table (7): Experts' opinions about Physical Tests (n = 10)

Tests	Component	Percentage
Leg strength with pulling dynamometer	Strength	100%
Bask strength with pulling dynamometer	Strength	90 %
Sit-ups for abdominal strength	Strength	80%
Wide jump for leg power	Power	90 %
Inclined back push of trunk (30 sec) for back power	Power	80 %
Sit-ups with bent knees (30 sec) for abdominal power	Power	80 %
Inclined back bending for back flexibility	Flexibility	100 %
Grand Car for thigh flexibility	Flexibility	90 %
Instep standing for static balance	Balance	90 %
Pass modified test for dynamic balance	Balance	100 %
Rope jumping for coordination	Coordination	80 %
Zigzag run	Agility	80 %

Tests chosen for this research are as follows:

Muscle strength:

- Leg strength with pulling dynamometer
- Bask strength with pulling dynamometer
- Sit-ups for abdominal strength

Muscle power:

- Wide jump for leg power
- Inclined back push of trunk (30 sec) for back power
- Sit-ups with bent knees (30 sec) for abdominal power

Flexibility:

- Inclined back bending for back flexibility
- Grand Car for thigh flexibility

Balance:

- Instep standing for static balance
- Pass modified test for dynamic balance

Coordination:

- Rope jumping for coordination

Agility:

- Zigzag run

Pilot Study:

The researcher applied the pilot study on a pilot sample (n=8) from the same research community and outside the main sample to calculate physical tests reliability and validity from 23-12-2018 to 27-12-2018.

Reliability:

Correlations between test and retest (with 7-day time interval) were calculated to prove reliability of

tests. Procedures were applied on 6-2-2007 and 13-2-2007 as seen in table (8).

Table (8): Correlations between test and retest on all physical variables for verifying reliability (n=8)

Variables	Test		Retest		R
	Mean	SD	Mean	SD	
Leg muscles strength	14.50	2.07	15.17	2.14	0.925
Back muscles strength	128.71	11.98	125.29	10.18	0.954
Abdominal muscles strength	39.65	2.35	39.82	3.75	0.840
Leg muscles strength	16.75	2.23	16.90	3.21	0.832
Back muscles strength	42.77	2.33	42.82	4.12	0.884
Abdominal muscles strength	19.72	3.21	20.32	3.04	0.853
Spine flexibility	3.54	0.67	3.81	0.74	0.858
Thigh flexibility	44.71	7.97	39.43	16.80	0.845
Static balance	3.86	0.90	4.14	1.21	0.852
Dynamic balance	12.32	2.25	11.37	3.24	0.782

R table value on $P \leq 0.05 = 0.707$

Table (8) indicated that R calculated values ranged from 0.782 to 0.954. this proves tests reliable.

Validity:

To verify validity of tests, the researcher presented them to (10) experts who agreed on its validity. The researcher then calculated distinct validity through applying tests to a distinct group

(n=8) and a non-distinct group (n=8) as seen in table (9).

Table (9) indicated statistically significant differences between the distinct and non-distinct groups on all research variables in favor of the distinct group. This proves the tests valid.

The recommended program of Jazz Dance and Integrated Functional Exercises:

Table (9): Difference significance between the distinct and non-distinct groups for physical tests.

Variables	Distinct group (n=8)		Non-distinct group (n=8)		(t)
	Mean	SD	Mean	SD	
Leg muscles strength	4.50	2.07	1.50	0.55	3.49*
Back muscles strength	128.71	11.98	96.86	2.67	6.86*
Abdominal muscles strength	46.22	2.10	39.65	2.35	5.52*
Leg muscles strength	29.25	1.22	16.57	2.33	12.81*
Back muscles strength	57.45	2.17	42.77	3.35	9.72*
Abdominal muscles strength	12.13	2.35	19.75	3.22	5.05*
Spine flexibility	3.54	0.67	1.28	0.55	6.85*
Thigh flexibility	44.71	7.67	16.57	1.27	9.57*
Static balance	3.86	0.90	0.71	0.76	7.00*
Dynamic balance	11.33	0.45	16.33	0.79	14.71*

(t) table value on $P \leq 0.05 =$

Aim:

The program aims to improve specific physical abilities under investigation in addition to some movements of modern dance.

Principles of designing the program:

1. The program should achieve its objectives
2. The program should be suitable for participants
3. The program should be flexible for modifications

4. The program should consider individual differences

5. The program should consider safety measures for students

6. The program should be continuous

7. The program should focus on strength and stability of core muscles

8. The program should include warm up and cool down periods

9. The program should be progressive form easy to difficult

10. The program should start with (60-68-9%) of intensity (130 pbm) and ends with (75-90%) of intensity (161 pbm)

11. The program should use music to avoid boredom and delay fatigue

12. The researcher should participate with students to motivate them

Each unit includes three stages:

1. **Warm Up** (5 min): To prepare body parts and muscles and to progressively move to basic training. This is an obligatory stage that should not be abandoned.

2. **Work Out** (50-70 min): This is the basic part of the program as it includes physical exercises (10 minutes as a foxed part along the program), flowed by Jazz Dance (15 min to 25 min) with progressive increase of 2.5 min every two weeks. These exercises are:

- (1) Jazz walks
- (2) Jazz walks with Arms
- (3) Traveling Jump with contraction
- (4) Tendues with plies
- (5) Flex and point
- (6) Jazz 4th
- (7) Jazz 4th contraction
- (8) Head rolls
- (9) Shoulder Isolation
- (10) Shoulder Isolation with contraction
- (11) Rib Isolations
- (12) Hip Isolations
- (13) Leg flicks
- (14) Back side for ward kick
- (15) Parallel Jumps
- (16) Bent knee jumps

The second part in this stage includes integrated functional exercises (15-25 min) including fall and stability of core muscles exercises (starting from 15 min to 25 min with 2.5 min increase every two weeks). This is followed by movement and free pattern exercises (10 min) as a fixed period along the program.

3. **Cool Down** (5 min): This is to recover body systems to normal. This includes relaxation and elasticity exercises with breath control at the end of each training unit.

Duration:

The program lasted for (10) weeks (3 units per week) with total number of (30) units. Each unit was (60) minutes for the weeks 1 and 2, (65) minutes for weeks 3 and 4, (70) minutes for weeks 5 and 6, (75) minutes for weeks 7 and 8 and (80) minutes for weeks

9 and 10 for the experimental group. The control group followed the regular training program.

The researcher applied two units of the program to a pilot sample (n=8) from the same research community and outside the main sample to verify the following:

- Suitability of the program
- Validating the place of application
- Suitability of of duration for each part of the training unit.
- Suitability of daily units for participants
- Suitability of selected jazz music for movements

Results indicated that the program is suitable in all these components.

Evaluation of modern dance movements under investigation:

Modern dance movements (circular fall – getting up – back fall – getting up – side fall – getting up – contraction arch – free pattern) are evaluated through three experts of motor expression (faculty members) with experience not less than 15 years. Evaluation is by (10) points for each movement while the free pattern is out of (30). Free pattern lasts for (3) minutes and includes movements under investigation in addition to linking movements and complementary movements on music.

Pre-measurements:

Pre-measurements for all research variables were taken from 30-12-2018 to 31-12-2018.

Program application:

The recommended program was applied from 1-1-2019 to 2—3-3-2019 (two and half months). This period includes vacations and national days in Kuwait. The experimental group exercised for three days per week (Saturday – Monday – Wednesday) after the academic day while the control group exercised for three days per week (Sunday – Tuesday – Thursday) after the academic day. All students were motivated to exercises.

Post-measurements:

Post-measurements for both groups on all research variables were taken from 24-3-2019 to 31-3-2019.

Statistical treatment:

The researcher used SPSS software to calculate the following:

Mean – median – SD – Squewness – Correlation Coefficient – (t) test (one group) – (t) test (two groups) – variance percentage (%).

3. Results:

Table (10) indicated statistically significant differences between pre- and post-measurements of the experimental group on physical variables in favor of post-measurements.

Table (10): Difference Significance between pre- and post-measurements of the experimental group on physical variables under investigation (n=11)

Variables	Pre-	Post-	Means difference	SD	(t)	Variance (%)
Age	63.50	83.01	19.51	2.45	25.34	30.72%
Height	65.58	85.12	19.54	2.41	25.71	29.79%
Weight	33.84	50.14	16.30	2.13	24.33	48.17%
Leg muscles strength	138.73	169.11	30.38	3.25	29.50	21.90%
Back muscles strength	39.75	52.03	12.28	1.28	30.70	30.89%
Abdominal muscles strength	3.83	15.95	12.12	1.16	32.76	316.45%
Leg muscles strength	42.50	59.19	16.69	1.45	36.28	39.27%
Back muscles strength	18.87	12.24	-6.36	1.10	18.17	33.70%
Abdominal muscles strength	4.53	6.25	1.72	0.37	14.33	37.97%
Spine flexibility	45.82	61.53	21.71	2.15	31.93	47.38%
Thigh flexibility	3.91	5.82	1.91	0.86	7.07	48.85%
Static balance	10.85	8.01	2.84	0.92	9.79	26.18%

(t) table value on $P \leq 0.05 = 2.09$ * significant

Table (11) indicated statistically significant differences between pre- and post-measurements of the experimental group on some movements and free pattern of modern dance in favor of post-measurements.

Table (11): Difference Significance between pre- and post-measurements of the experimental group on some movements and free pattern of modern dance (n=11)

Variables	Pre-	Post-	Means difference	SD	(t)	Variance (%)
Circular fall	3.65	8.12	4.47	2.13	6.67*	122.47%
Getting up	2.14	6.72	4.58	2.22	6.54*	214.02%
Back fall	3.35	8.14	4.79	2.35	6.47*	142.99%
Getting up	2.06	6.45	4.39	2.27	6.10*	213.11%
Side fall	2.67	8.37	5.70	2.66	6.79*	213.48%
Getting up	2.10	6.25	4.15	2.21	5.93*	196.62%
Contraction Arch	2.84	6.96	4.12	2.07	6.34*	145.07%
Free Pattern of Modern Dance	7.15	22.35	15.00	4.85	9.80*	209.79%

(t) table value on $P \leq 0.05 = 2.09$ * significant

Table (12) indicated statistically significant differences between pre- and post-measurements of the control group on physical variables in favor of post-measurements.

Table (12): Difference Significance between pre- and post-measurements of the control group on physical variables under investigation (n=11)

Variables	Pre-	Post-	Means difference	(t)	SD	Variance (%)
Age	58.92	62.32	3.4	8.72*	1.24	5.77%
Height	57.25	60.38	3.13	7.83*	1.27	5.47%
Weight	33.91	35.12	1.21	4.65*	0.82	3.57%
Leg muscles strength	132.18	155.91	23.73	5.62*	13.35	17.95%
Back muscles strength	39.66	42.36	2.70	7.50	1.13	6.80%
Abdominal muscles strength	3.29	4.27	0.98	14.00*	0.22	29.79%
Leg muscles strength	42.90	46.02	3.12	7.26*	1.35	7.27%
Back muscles strength	19.12	18.22	-0.90	9.00*	0.32	4.71%
Abdominal muscles strength	3.92	4.01	0.09	9.00*	0.04	2.30%
Spine flexibility	46.45	52.70	6.25	5.39*	3.66	13.46%
Thigh flexibility	4.18	4.98	0.80	4.00*	0.62	19.14%
Static balance	10.84	9.04	-1.80	6.43*	0.98	16.60%

(t) table value on $P \leq 0.05 = 2.09$ * significant

Table (13) indicated statistically significant differences between pre- and post-measurements of the control group on some movements and free pattern of modern dance in favor of post-measurements.

Table (13): Difference Significance between pre- and post-measurements of the control group on some movements and free pattern of modern dance (n=11)

Variables	Pre-	Post-	Means difference	(t)	SD	Variance (%)
Circular fall	3.55	4.62	1.07	3.75*	0.94	30.14%
Getting up	2.16	4.04	1.88	7.23*	0.82	87.04%
Back fall	3.39	4.55	1.16	4.83*	0.77	34.22%
Getting up	2.09	3.95	1.86	6.89*	0.86	88.10%
Side fall	2.50	3.42	0.92	4.38*	0.65	36.80%
Getting up	2.15	32.63	1.48	5.48*	0.84	68.84%
Contraction Arch	2.75	3.68	0.93	5.81*	0.51	33.82%
Free Pattern of Modern Dance	7.00	14.02	7.02	5.36*	4.13	100.29%

(t) table value on $P \leq 0.05 = 2.09$ * significant

Table (14) indicated statistically significant differences between post-measurements of the experimental and control group on physical variables in favor of the experimental group.

Table (14): Difference significance between post-measurements of the experimental and control groups on physical variables (n1 = n2 = 11)

Variables	Control		Experimental		(t)
	Mean	SD	Mean	SD	
Age	62.32	11.34	83.01	15.04	3.47
Height	60.38	11.85	85.12	3.61	4.33
Weight	35.12	12.23	50.14	4.02	2.55
Leg muscles strength	155.91	11.23	169.11	2.54	2.27
Back muscles strength	42.36	1.82	52.03	4.08	2.16
Abdominal muscles strength	4.27	1.16	15.95	0.58	9.82
Leg muscles strength	46.02	2.03	59.19	3.75	9.76
Back muscles strength	18.22	1.85	12.24	0.60	5.92
Abdominal muscles strength	4.01	1.16	6.25	1.20	4.23
Spine flexibility	52.70	3.48	67.53	3.14	10.02
Thigh flexibility	4.98	0.82	5.82	1.18	2.21
Static balance	9.04	0.95	8.01	0.84	2.58

(t) table value on $P \leq 0.05 = 2.07$ * significant

Table (15) indicated statistically significant differences between post-measurements of the experimental and control group on some movements and free pattern of modern dance in favor of the experimental group.

Table (15): Difference significance between post-measurements of the experimental and control groups on some movements and free pattern of modern dance (n1 = n2 = 11)

Variables	Control		Experimental		(t)
	Mean	SD	Mean	SD	
Circular fall	4.62	1.24	8.12	0.84	7.45
Getting up	4.04	1.02	6.72	1.22	5.36
Back fall	4.55	1.15	8.14	0.85	7.98
Getting up	3.95	0.40	6.45	2.04	3.79
Side fall	3.42	0.82	8.37	0.58	15.47
Getting up	3.63	0.65	6.25	1.02	6.49
Contraction Arch	3.68	0.60	6.96	1.08	8.41
Free Pattern of Modern Dance	14.02	0.79	22.35	3.68	7.00

(t) table value on $P \leq 0.05 = 2.07$ * significant

4. Discussion:

Tables (10) and (11) indicated statistically significant differences between the pre- and post-measurements of the experimental group on physical variables, performance of some movements and free patterns in modern dance in favor of post-measurements. Highest improvement values on physical variables was (316.45%) for abdominal strength while the least value was (21.90%) for leg power. The highest value for movements was (214.02%) for getting up from circular fall while the least value was (22.47%) for circular fall.

The researcher thinks that this is due to the recommended program of Jazz Dance and integrated functional exercises as Jazz dances start and end with Bent Knees jumps while functional exercises involve most parts of the body and improves physical fitness. The program also included specific exercises for core body like contraction.

This is consistent with Yasumura et al (2000) who indicated that integrated functional exercises had positive effects on balance, power, flexibility and agility. It is also consistent with Ron Jones (2003) who indicated that Jazz Dance is a type of individual creative dance that moves all body parts individually and progressively. This means that once you learn it you can unleash your imagination to gain strength and amusement. You can also increase or decrease speed as you wish. This means that Jazz dance works on improving balance and muscular nervous coordination.

This is also consistent with the results of Cress et al (1996), Yasumura et al (2000), Mari Jake et al (2004), Cymara et al (2004) Abd Al-Monem, D. (2004) and Youssef, A. (2005) who indicated that the recommended programs improved leg, back and abdominal strength and power in addition to flexibility, coordination and both types of balance. It also improved the technical performance as continuous exercises improve specific physical qualities and the performance level of modern dance movements.

This proves the first hypothesis stating that "There are statistically significant differences between the pre- and post-measurements of the experimental group on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of post-measurements".

Tables (12) and (13) indicated statistically significant differences between the pre- and post-measurements of the control group on physical variables, performance of some movements and free patterns in modern dance in favor of post-measurements. Highest improvement values on

physical variables was (29.79%) for abdominal power while the least value was (2.3%) for static balance. The highest value for movements was (100.29%) for free patterns while the least value was (30.14%) for circular fall.

The researcher thinks that this is due to punctuality in training for the control group who followed the regular training program that included warm-up and various exercises on the obligatory movements of the third-year curriculum. This program depended on verbal instruction and models. This motivates students to simulate the movements they saw and compete with each other as each student tries to prove herself superior to her peers. This improved physical fitness components in addition to movements and free patterns in modern dance.

Abd Al-Khalek, E. (2000) indicated that technical performance is linked to specific motor and physical abilities as mastering technical performance depends on improving the requirements of this performance. These requirements include power, coordination, agility, flexibility and both types of balance. It can be measured by the level of acquisition of these qualities by the student. Al-Azab, F. (1993), Ibrahim, E. & Darwish, N. (1994) and Ahmed, S. & Rabia, S. (2002) indicated that strength, power, coordination, flexibility, flexibility and balance are basic and influential components in modern dance.

This is consistent with Abd Al-Monem, D. (2004) and Youssef, A. (2005) indicated that the recommended programs improved the performance level of modern dance and specific fitness components.

This proves the second hypothesis stating that "There are statistically significant differences between the pre- and post-measurements of the control group on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of post-measurements".

Tables (14) and (15) indicated statistically significant differences between the post-measurements of the experimental and control groups on physical variables, performance of some movements and free patterns in modern dance in favor of the experimental group.

The researcher thinks that these improvements are due to the recommended Jazz Dance and Integrated Functional Exercises program that concentrated in one of its parts on improving physical qualities while improving technical performance of modern dance is done practically.

Abd Al-Khalek, E. (2000) indicated that technical performance is linked to specific motor and physical abilities as mastering technical performance depends on improving the requirements of this

performance. These requirements include power, coordination, agility, flexibility and both types of balance. It can be measured by the level of acquisition of these qualities by the student. Abd Al-Maksoud, E. (1997) indicated that exercise affects working muscles practically and improves motor performance in general.

Al-Nimr, A. & Al-Khateeb, N. (1996) indicated that performance can be improved if training is specific for the activity practiced and involves all working muscles in a way similar to competitions.

Al-Azab, F. (1993), Ibrahim, E. & Darwish, N. (1994) and Ahmed, S. & Rabia, S. (2002) indicated that strength, power, coordination, flexibility, flexibility and balance are basic and influential components in modern dance. This is consistent with Abd Al-Monem, D. (2004) and Youssef, A. (2005) indicated that the recommended programs improved the performance level of modern dance and specific fitness components.

Cress et al (1996) Yasumura et al (2000), Mari Jake et al (2004), Cymara et al (2004) Abd Al-Monem, D. (2004) and Youssef, A. (2005) who indicated that the recommended programs improved leg, back and abdominal strength and power in addition to flexibility, coordination and both types of balance.

This proves the third hypothesis stating that "There are statistically significant differences between the pre- and post-measurements of the experimental and control groups on some specific physical qualities, performance level of some movements and free patterns of modern dance in favor of the experimental group".

Conclusions:

4. The recommended training program with integrated functional exercises had positive effects on all physical variables and the performance level of some movements and free expression in modern dance.

5. There are statistically significant differences between the experimental and control groups on all research variables in favor of the experimental group.

6. Variance percentages on all research variables were higher for the experimental group compared with the control group.

Recommendations:

1. Using the recommended training program with integrated functional exercises for students of several grades in the faculty due to its positive effects on all research variables.

2. Using the recommended training program with integrated functional exercises for improving several types of motor expression.

3. Performing more studies on Jazz dance and integrated functional exercises in several sports activities.

4. Performing more studies on various age groups of males and females, especially during childhood as these exercises are simple and joyful.

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