Effect of Imagery Training on Motor Imagery and Soccer Dribble Skills among Novice Female Students

【Research notes / materials】

Effect of Imagery Training on Motor Imagery and Soccer Dribble Skills among Novice Female Students

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ABSTRACT

The purpose of this study is to examine the effect only of imagery training on motor imagery and soccer dribble skills among novice female students. The effect by the interventions of 3 kinds, Dohsa-hou, an imagery training method by closing the eyes for rest, and an imagery training method for visually impaired individuals was compared by this study. As a result, it was discovered that motor imagery and soccer dribble skills improved the imagery training method for the visually impaired more than the other two methods, at the start learning. However, it was recommended that Dohsa-hou should be taken together with technological skills, and the imagery training method of closing the eyes for rest requires further examination. Thus, it was expected that researcher and practitioner would consider about methodology of imagery training, is introduced new evidences in this study.

Keywords

Imagery training, Dohsa-hou, Soccer, Inclusive education

I. Introduction

Imagery training method is one of the effective movement learning techniques (Japanese Society of Sport Psychology, 2012). Imagery is defined as the association of sense with what a person holds in their mind (Naruse, 1988; Tajima, 1991). This study applies this definition to movement situation.

A mental training method is the imagery training method, indicated by motor imagery skills and movement performance. Previous research has indicated that vividness, controllability, and internal imagery have been emphasized (Fujita, 1980; Inomata, 1991; Mahoney and Avener, 1977; Munford and Hall, 1985).

However, the method of imagery training differs among researchers. It has been reported that imagery training is ineffective when not combined with physical practice (Nakagomi, 2010). Therefore, imagery training does not have its own effect. Moreover, it has been reported that the ratio of success to failed cases is 1 to 1 (Feltz and Landers, 1983; Inomata, 1991; Murphy, 1994). Thus, this methodology needs to be reconsidered.

In the present study, three imagery training methods are considered. First is an imagery training method that includes closing ones' eyes for rest (hereinafter called closing eyes for rest). Hamberger and Lohr (1980) reported that closing the eyes, relaxes and promotes memory retrieval and visualization of imagery. It is recommended for a duration of three to five minutes once an exercise, because it should be performed with as much concentration as possible (Inomata, 1991). Thus, previous research indicated that the imagery training method of closing the eyes for rest was mainstream (Suiin, 1986).

Second is the psychological rehabilitation method called Dohsa-hou. Dohsa-hou is a nonverbal psychotherapy that takes place through movement, not language. The generation process of the movement, including posture control, is a body chart by Dohsa-hou is "intend - effort - physical activity" (Hoshino, 2003; Momose, 1998). In other words, movement is the psychological process by which "effort" ensures a learner imagined movement, and that "intend" to be important to be completed for the movement formation as "physical activity." It is thought that the psychological process that first intends and then makes an effort to perform is imagery training (Hoshino, 1994).

Third, the latest imagery training method was developed by Momose (2020) for visually impaired individuals, including congenital blindness. This method includes three elements which consist of immediate feedback, which is the basis of visually

impaired sports guidance, imaging under moving by past reports of sighted persons (Mizuguchi et al., 2012), and posture control of Dohsa-hou (Momose, 1998). Therefore, this method is effective on sighted persons as well as the visually impaired. Thus, an inclusive imagery training method can be expected.

Therefore, the purpose of this study was to investigate the effect of imagery training on motor imagery and soccer dribble skills among novice female students. In particular, the effects of the three techniques, Dohsa-hou, closing the eyes for rest, and the method for visually impaired individuals, were also compared in this study.

It was suggested to consider that a researcher and a practitioner use the new evidence that this study was introduced about a way of image using.

II. Methods

Participants

The participants were 41 college students. All participants were women and novice soccer players.

Practitioners

Practitioners were the author and six students who learned sports psychology under the author's guidance.

Experimental design

The experimental design was a mixed design of 2 (learning time, pre-post) × 4. (Group, control group, Dohsa-hou group, closing the eyes for rest group, and method for the visually impaired). Participants were assigned to four groups: control group (n=10), Dohsa-hou group (n=10), closing the eyes for rest group (n=11), and the method for the visually impaired group (n=10, hereinafter called the inclusive method group) at random.

Interventions

The intervention method was set to the following four conditions, The practice chance is once. Furthermore, physical activity was not performed.

(1) Control group

There was no intervention in the control group. The participants were simply asked to sit down and stand for 20 minutes.

(2) Dohsa-hou group

For posture control, a weight movement in front and behind the left and right arm and movements in the chair-sitting and standing position were performed by this group (Hoshino, 2003; Momose, 1998). Though both were put into effect by the participants themselves, I made them conscious of the body chart as "intend - effort - physical activity." I made them work on the movement tasks.

(3) Closing eyes for rest group

Here, a short time is imagined many times by closing the eyes for rest in the state that sat down on a chair, as recommended from the past (Hamberger and Lohr, 1980; Inomata, 1991; Suiin, 1986), practice was repetitive for 20 minute.

(4) Inclusive method group

This imagery training method includes three elements which consist of immediate feedback, which is the basis for visually impaired sports guidance, imaging under moving by past reports for sighted persons (Mizuguchi et al., 2012), and a posture control of Dohsa-hou (Momose, 1998).

Measurements

Measurements were a change in motor imagery and soccer dribble skills.

(1) Motor imagery skills

The change in motor imagery skills was assessed using Movement Imagery Questionnaire-Revised; Japanese Version (JMIQ-R; Hasegawa, 2004). The JMIQ-R consists of eight items including the internal imagery (four items) and the externa image (four items). The internal imagery is as if one goes, a subjective one. The external imagery is objectively imagined as a third person. JMIQ-R rates the degree of difficulty on a 7-point scale.

(2) Soccer dribble skills.

The change in soccer skills was assessed by measuring the time taken to perform a zigzag dribble (Fig.1) and straight line dribble (Fig.2) (Momose and Ito, 2018). Zigzag dribble time was measured when a total of 10 m was dribbled in an alternate zigzag, with triangular cones every 1 m. Straight line dribble time was measured when a total of 20 m was dribbled by taking a single round around a 10 m straight line of triangle cones.

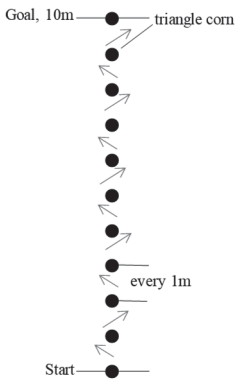

Fig.1. Zigzag dribble stuation

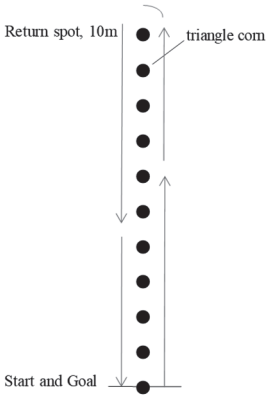

Fig.2. Straight dribble stuation

Procedure

The procedure is illustrated in Figure 3. First, I obtained informed consent (5 minutes). Next, the pre-test (JMIQ-R and dribble time, 20 minutes) was performed. Following this, the interventions (20 minutes) were conducted. Finally, a post-test (JMIQ-R and dribble time, 20 minutes) was performed.

Ethical treatment

I obtained informed consent by explaining the process to the participants. Participation in the study was optional and all personal information was kept confidential.

III. Results

Change in the JMIQ-R score

The change in the JMIQ-R score is shown in Table 1. Fig.4. Fig.5.

(1) Change in internal imagery scores

It was conducted a two-factor repeated measures ANOVA on the conditions, and the result showed a significant difference in the within- group learning time (pre-post) factor (F (1,37) = 7.222, p<.05). But it was not found any significant differences in the between- group factor, and the interaction effects.

Multiple comparisons with the Bonferroni method showed a significant difference in the pre-test and post-test (p<.05; p<.05) in the inclusive and Dohsa-hou groups.

(2) Change in external imagery scores

It was conducted a two-factor repeated measures ANOVA on the conditions, and the results showed a significant difference in the within-group time (pre-post) factor (F (1,37) = 25.3249, p<.01). It was not found any significant differences in the between-group factor and interaction effects.

Multiple comparisons with the Bonferroni method showed a significant difference between the pre-test and post-test (p<.05; p<.01; p<.01) in the inclusive, Dohsa-hou, and control groups.

Change in the soccer dribble time

The zigzag dribble and straight line dribble times are indicated in Table 2, Fig.6, and Fig.7.

(1) Change in zigzag dribble time

I conducted a two-factor repeated measures ANOVA on the conditions, and the results showed a significant difference in the within-group time (pre-post) factor (F (1,37) = 5.3313, p<.05). I did not find

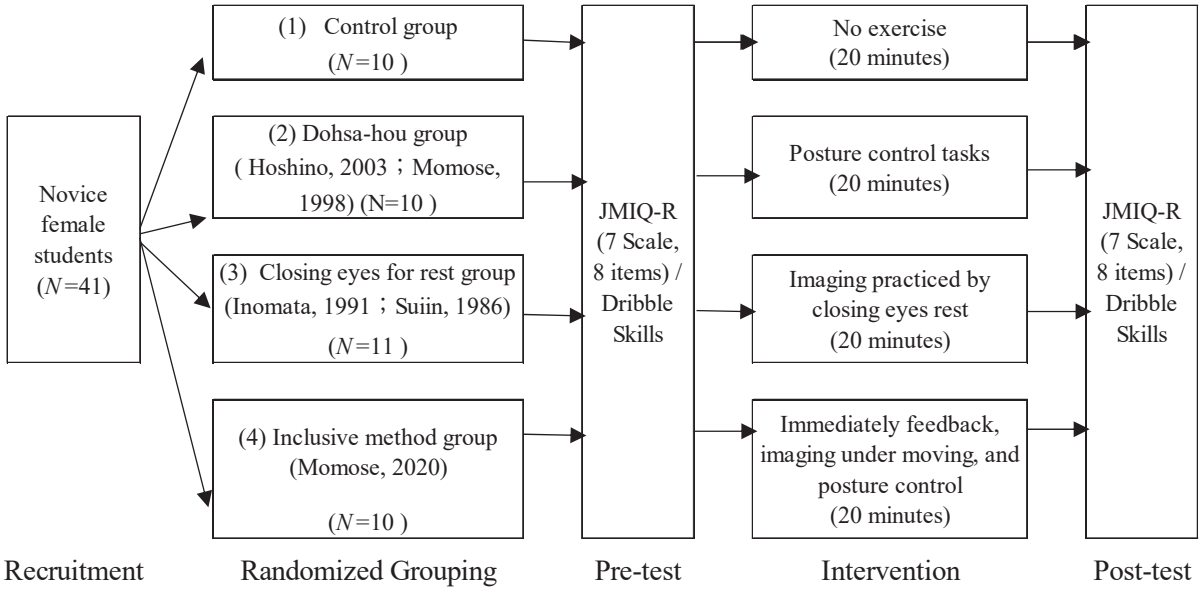

Fig.3. Chart flow of reseach

Table.1. Change in the JMIQ-R score

		Control (N=10)		Dohsa-hou (N=10)		Closing the eyes (N=11)		Inclusive (N=10)		*F value*			
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Inter-grorp Learning time (Pre×Pre)	Within-grorp Group (4 kind)	Interaction	Simple main effect
Internal image	*M*	19.30	19.50	17.80	21.10 *	20.09	21.46	20.00	23.10 *	7.2222 *	0.5006	0.9769	Dohsa-hou*, Inclusive*
	SD	5.08	5.52	5.63	7.02	4.83	4.61	5.62	3.28				
External image	*M*	18.50	21.80 **	17.80	21.70 **	21.00	22.70	21.46	24.18 *	25.3249 **	0.9934	0.6426	Control**, Dohsa-hou**, Inclusive*
	SD	5.84	6.22	4.64	6.31	4.83	3.95	4.66	3.09				

*p<.05,**p<.01

Table.2. Change in the soccer dribble time

		Control (N=10)		Dohsa-hou (N=10)		Closing the eyes (N=11)		Inclusive (N=10)		*F value*			
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Inter-grorp Learning time (Pre×Pre)	Within-grorp Group (4 kind)	Interaction	Simple main effect
Zigzag dribble time (sec)	*M*	14.98	14.74	15.10	14.87	16.14	15.66	16.31	14.03 **	5.3313 *	0.4112	1.9790	Inclusive**
	SD	3.31	3.06	2.61	2.06	2.59	2.99	1.96	1.88				
Straight line dribble time (sec)	*M*	11.93	10.36 **	11.55	10.77	12.93	12.08	13.67	11.76 **	32.968 **	1.9467	1.5558	Control ** Inclusive**
	SD	3.26	2.15	1.82	1.39	1.93	1.68	2.24	1.48				

*p<.05,**p<.01

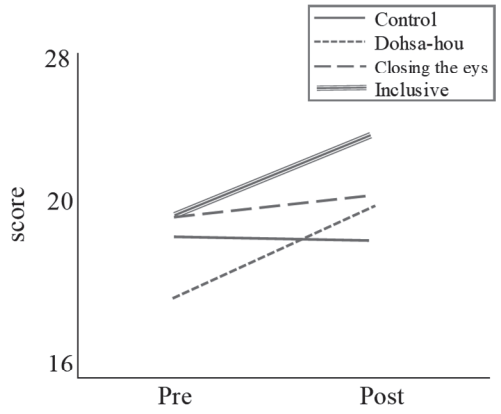

Fig.4. Change in internal imagery scores

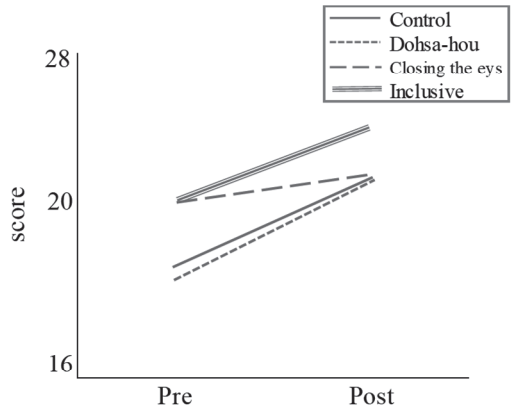

Fig.5. Change in external imagery scores

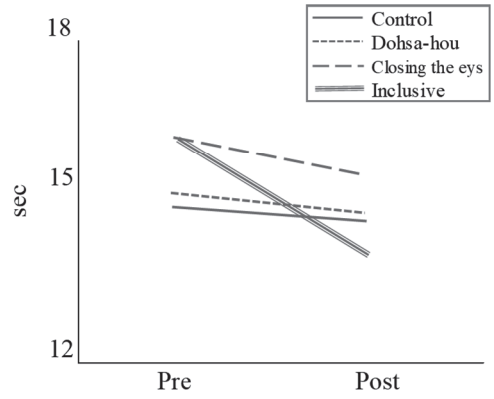

Fig.6. Change in zigzag dribble time

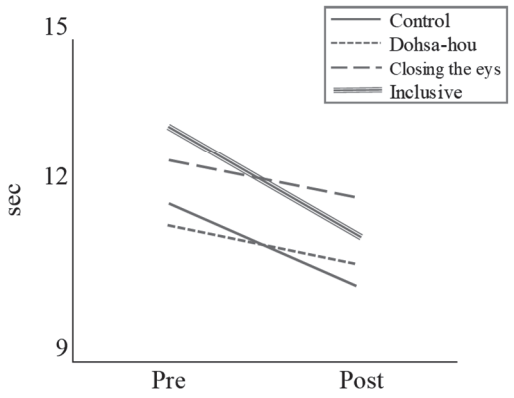

Fig.7. Change in straight line dribble time

any significant differences in the between-group factor and interaction effects.

Multiple comparisons with the Bonferroni method showed a significant difference in the pre-test > post-test, $p<.01$) in the inclusive method group.

(2) Change in straight line dribble time

I conducted a two-factor repeated measures ANOVA on the conditions, and the results showed a significant difference in the within-group time (pre-post) factor (F (1,37) = 32.9682, $p<.01$). I did not find any significant differences in the between-group factors or interaction effects.

Multiple comparisons with the Bonferroni method showed a significant difference in the Pre-test > Post-test, $p < .01$; $p<.01$) in the Inclusive group and the control group.

IV. Discussion

It has been reported that imagery training is ineffective when not combined with physical practice (Nakagomi, 2010). However, this study aimed to investigate the effect of imagery training on motor imagery and soccer dribble skills for novice female students. The effects of three techniques, Dohsa-hou, closing the eyes for rest, and a method for visually impaired individuals were compared.

As a result, motor imagery and soccer dribble skills improved in the imagery training method for the visually impaired more than the other two methods.

A zigzag dribble occurred every 1m while operating a ball by a foot, and it is suggested that influence makes the small movement alternate. It is also suggested that straight line dribble unites dribbling with running. It combines an image and an actual movement, in the inclusive method group.

Previous research has emphasized vividness, controllability, and internal imagery (Fujita, 1980; Inomata, 1991; Mahoney and Avener, 1977; Munford and Hall, 1985). However, when an external imagery as well as an experience imagery can also be effectively used, it is more suitable for imagery training practice for persons with visual disorders (Momose, 2020). Thus, it was considered that an inclusive method can better improve experience, external, and dribble skills.

It was revealed that Dohsa-hou promoted both internal and external images. However, it thought that learners could request to be conscious of the movement peculiar to play. This is because Dohsa-hou is unrelated to the movement skill which is peculiar to play as a dribble movement.

Previous research indicated that the imagery training method, closing the eyes for rest, was mainstream (Suiin, 1986). And it was recommended for a duration of three to five minutes once an exercise. Therefore, it is more desirable to use an imagery training method by closing the eyes for rest with body activity and learn continuation (Nakagomi, 2010).

Thus, it was revealed that the imagery training method for the visually impaired promoted internal images, external images, and dribble skills in spite of learning opportunities only once. On the other hand, it was recommended that Dohsa-hou together with technological skills, and an imagery training method of closing eyes for rest should be required continuing exercise, as if it's used for the time of the start learning. And, future's problem is to increase the practice number of times and to recruit expert participants.

Finally, it was expected that researcher and practitioner would consider about methodology of imagery training, including merit and demerit, is introduced new evidences in this study.

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イメージトレーニングが女子サッカー初心者のドリブル動作スキルおよび運動イメージ生成に及ぼす影響

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要約

本研究では，動作法，閉眼安静によるイメージトレーニング法，視覚障害者向けイメージトレーニング法の 3 種類の手法による効果を比較検討した．その結果，視覚障害者向けイメージトレーニング法は運動イメージ生成面でも運動パフォーマンス面でもより効果的なイメージトレーニング法であると推測された．したがって，視覚障害者向けイメージトレーニング法は晴眼学習者にも奏功するインクルーシブな指導法だと考えられた．それに対し，もし初学時に使うなら，動作法は競技特有の技術スキルと結びつけ，閉眼安静でイメージ生成練習する際には効果を発揮するまでに時間を要する可能性があるため継続して，併用的に用いることが提案された．以上より本研究は，研究者と実践者にとって，イメージトレーニングの方法論を考察する一資料になることが期待された．

キーワード

イメージトレーニング，動作法，サッカー，インクルーシブ教育