

Abstract

**Effects of Relative Frequency of Knowledge of Performance
on Balance Retraining in Patients With Hemiplegia**

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During therapy sessions, feedback is often provided concurrently by the physical therapist as the patient attempts to perform a movement and after the movement attempt. This feedback is provided to enhance the patient's balance abilities. However, recent studies in nondisabled populations have suggested that frequent feedback may be detrimental to retention or learning of motor skills.

This study compared the effects of 100% relative frequency of knowledge of performance (KP) with 66% relative frequency of KP for motor learning on balance retraining in patients with hemiplegia. Twenty patients with hemiplegic were randomly assigned to one of two experimental groups. The acquisition phase consisted of 16 blocks of 5 trials for 2 days (80 total practice trials). The retention phase consisted of 2 blocks of a short-term retention test, one day after the end of the acquisition phase and a long-term retention test, one week after the end of the short-term retention test. In the 100% feedback condition, participants received feedback after every practice trial. A faded KP schedule was used in the 66% condition.

No significant differences were found between the two groups during all experimental phases (acquisition and retention phases), ($p > .05$). However, there were significant decreases in balance index for both groups of acquisition phase ($p < .05$).

These results suggest that 66% relative frequency of KP is not more effective than 100% relative frequency of KP with respect to retention over time when hemiparetic patients attempt to learn balance.

Key Words: Hemiplegia; Knowledge of performance; Balance retraining.

feedback)
(extrinsic feedback)
(Shumway-Cook, 1988), (Schmidt, 1988; Winstein, 1987).
(sway)
(steadiness), (augmented
feedback)
(Winstein,
1991).
(Goldie, 1989).
(Bohannon Larkin, 1985),
(Locke, 1968; Nicholson, 1996;
(Brandstater, 1983; Salmoni, 1984; Winstein, 1987; Winstein,
Hoeherman, 1984). 1991).
(concurrent
feedback)
(knowledge of result; KR)
(Nichols, (knowledge of performance; KP)
1997; Shumway-Cook, 1988; Wannstedt
Herman, 1978; Winstein, 1989). (kinematic)
(kinetic)
(motor learning) 가
(Gentile, 1972; Schmidt, 1991; Vander Linden
, 1993; Weeks Kordus, 1998; Winstein,
1991; Winstein, 1996).
(retention test)가
(Simmons, 1998; Vander Linden, 1993). Schmidt(1988)
가 가
(Schmidt Young,
1991; Vander Linden, 1993; Winstein, 1987).
가
(Croce, 1996; Schmidt Wulf, 1997; (Salmoni, 1984; Vander Linden, 1993),
Vander Linden, 1993; Weeks Kordus,
1998; Winstein Schmidt, 1990; Winstein
, 1994; Winstein, 1996).
(Weeks Kordus, 1998).
(intrinsic) 가

(neuro- 50%
 developmental treatment; NDT)
 (proprioceptive neuromuscular 가 , 100% 50%
 facilitation technique; PNF) . Vander
 Linden (1993)
 100% 50%
 (Vander Linden , 1993). 100% 50% 가
 , Weeks Kordus(1998)
 100% 33%
 (Winstein, 1991), Schmidt Wulf 100% 33%
 (1997) . Croce (1996)
 . Winstein (1996) 가
 , Simmons (1998) .
 66%
 .
 . 100%
 66%
 (acquisition phase) 가 .
 . 66% 100%
 가
 (Nicholson, 1996; Schmidt, 1991; Winstein , 1994). .
 1.
 (Winstein , 1994). 2000 4 2000 10
 .
 20
 100% 10 66% 10
 0%
 100%
 가 (Vander Linden , 1993;
 Winstein, 1991).
 가.
 .
 .
 (, 1995).
 (2000) 100%

30 가 20 가

2. 16 가 2

가. 가 , 1 5 가 24 가

가 가 KAT2000¹⁾ 1 2

가 1 4 5 5 , 10 20

가 1° 가 3.5 mm 80 35 . 100% , 66% . 66%

가 가

0 6 psi 가 (Winstein Schmidt, (pounds per square inch) 1990; Winstein , 1999) 1 14 100% , 15 27 67%, 28 40 psi가 33% 66% 가 53

3. 3.0 psi 2×16() ×) 가 20 cm , 20 5 가 가 2×2(5 10 , 가 20 ×)

(balance index; BI)

1) Kinesthetic Ability Training. Berg. Inc., 1994.

Chart#: 1010 lee hyun aoo
Date: 10/11/0 Time: 14:24:25
Pattern: circle.cbt
Bilateral Dynamic
SI: 2872
Pos X: 1262 Neg X: 1610
Pos Y: 1572 Neg Y: 1300
SI Ratio: -0.121
FB Ratio: 0.095



2.

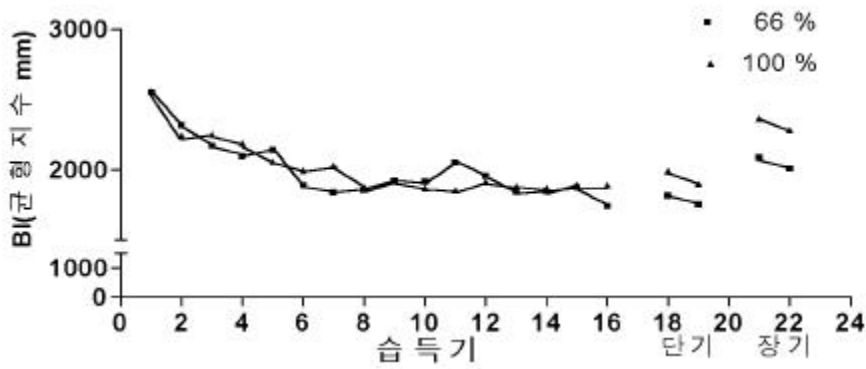
SPSS/PC+

100% 5
(50%) , 66% 4 (40%) 6
(60%) 가
100%
6 (60%) 4 (40%) , 66%
5 (50%) 100
1. 가 6 (60%), 가 4 (40%) , 66%
100%
가 6 (60%), 가 4 (40%) , 66%
66% 가 7 (70%), 3 , 63 kg
100%
(30%) 가 16 56 , 66%
22 61 100%

1. (n=20)

	100% (n ₁ =10)	66% (n ₂ =10)
	6(60%)	7(70%)
	4(40%)	3(30%)
	5(50%)	6(60%)
	5(50%)	4(40%)
	6(60%)	5(50%)
	4(40%)	5(50%)
()	16.1±6.69*	22.0±5.90
()	56.8±10.05	61.3±7.04
(kg)	64.4±13.37	63.1±11.68

* ±



2.

2. 100% 66%
 가 (p<.05),(2).
 100% 66%
 66% 16 80

3.

가 1 10
 2

2.

				F	p
	1	333737.29	333737.29	.06	.79
	15	11995944	799729.59	12.03	.00*
×	15	692014.15	46134.27	.69	.79

*p<.05

3.

				F	p
	1	252492.10	252492.10	.39	.53
	1	56851.60	56851.60	2.73	.11
×	1	2402.50	2402.50	.11	.73

4.

				F	p
	1	760656.40	760656.40	1.82	.19
	1	61152.40	61152.40	2.93	.10
×	1	16.90	16.90	.00	.97

가

가

가 가

(p>.05),(3).

가

가

4.

가 1 Bilodeau

2 10

(p>

.05),(4).

Winstein Schmidt(1990)

100% 50%

50%

(Hanlon, 1996).

가 (faded feedback)

(Schmidt, 1988).

가 가

100%

가

25%

가

(Hanlon, 1996).

10

50% 100%

66%

100%

100% 50%

50%

(Schmidt, 1991).

가

Bilodeau Bilodeau(1958)

Nicholson Schmidt(1991)

가 50% 100%

가

가 50%

가 100%

50%

가 Schmidt(1991)

100% 66%

Vander Linden (1993)

Winstein (1999) ($p < .05$),

가 ($p > .05$).

100% 50% 100% 66% 100%

50% 100%

(Balogun, 1994)

Wishart Lee(1997)

100%

(1998) Weeks Kordus 67%

가 , 67%

100% 33%

Wulf(1997) Schmidt

33% 100%

Winstein (1999)

100%

67%

가

가

가 20 100%

가 66%

(Salmoni, 1984; Vander Linden, 1993),

1. 100%
 66%
 가 (p<.05),
 가 (p>.05).

2. (p>.05),
 가 (p>.05).

3. (p>.05),
 가 (p>.05).

100% 66% 가
 가 ,
 가 .

, . : ,
 , 1995.
 , .

2000;7:55- 63.

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