

Study of runout-motion in body physical techniques: physical index and sensory index

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Abstract

Body physical technique is to pursuit the dynamic motion by the physical index(PI) and sensory index(SI) on the physical body function. Function of the physical body by the motor condition is organized the dynamic physical system. For the physical motion of signal, we is defined a runout value of the body function by the physical index on the dynamic state. The concept of body physical index was identified the reference of physical index and sensory index by the body technique.

As to detect a variation of the body physical technique-runout physical index(BPT-RPI) of the maximum and average and minimum in terms of physical motion, and the dynamic sensory value that was a runout function of the vision variation of the $Vi-\zeta_{MAX-AVG-MIN}$ with 2.53 ± 4.85 units, that was a runout function of the vestibular variation of the $Ve-\zeta_{MAX-AVG-MIN}$ with (-0.69 ± 2.32) units, that was a runout function of the somatosensory variation of the $So-\zeta_{MAX-AVG-MIN}$ with (-1.43 ± 1.36) units.

The dynamic physical motion will be to confirm at the variable function of the runout motion for the body function values of dynamic physical index on the BPT-RPI that was identified an evaluation of the physical sensory function by the dynamic physical system. Runout body system was mentioned of a physical body situation by the mild moving and was refer a runout data of dynamic physical nervous index.

Keywords: body physical techniques, runout physical index, dynamic physical motion, body physical index

1. Introduction

Recently, the physical control mechanisms need to be leaded for effective activity completion of postural control and physical body movement. Hence, physical control of training should be carried out in the context in reference posture function and may be essential for the implicit engagement of the several motor patterns on the underlying guide motion for integration of the sensory and motor systems [1-2]. Postural regulation and body stance requires the control of different organs segments in a synergetic effect action. Postural situation contribute to the body function and describe to dynamic sway the hip and the ankle strategies, using a popular experimental paradigm based on external postural perturbations [3]. In the external postural

strategy, the postural system response is characterized by the analysis of several motions for a large activity and movement condition [4].

In this study, the concept of the body physical technique is to be perform the the physical condition on the runout-motion function; such as the physical index(PI) and protocol can regulate the signals of physical condition with PI-SI condition. Therefore, we desire to verify a runout value of the physical f sensory index(SI). These index technique is showed a variation of runout-motion when the equivalent unction by the physical and sensory index.

2. Proposed method of body physical techniques for signal

A. System of body physical signal

The measures of motion stability score on the DMBI are Overall Stability Index(OSI), Medial–Lateral Stability Index(MLSI) and Anterior–Posterior Stability Index(APSI). These indices are standard deviations that assess the path of sway around the zero point from the center of the platform and are measured in degrees. The stability indexes scores show the foot displacement for motion in sagittal and frontal planes. Within this study, the displacements from horizontal along medial–lateral(ML) axes as x-direction, and from vertical along anterior–posterior (AP)axes as y-direction were evaluated as DMBI-MLSI and DMBI-APSI respectively. The equations for DMBI-OSI, DMBI-MLSI and DMBI-APSI scores are as follows: [5]

The DMBI recorded the foot displacement in the x-direction and y-direction. Then, the system will generate the DMBI-OSI, DMBI-APSI and DMBI-MLSI using the equations above. The DMBI-OSI score was established by combining the degree of tilt for AP and ML axes for runout physical index (RPI), as this had been suggested as the best balance indicator to measure over all platform balance. The equations for RPI-AP and RPI-ML scores are as follows: [6]

$$\begin{aligned} \text{DMBI. OSI} &= \frac{\sqrt{\sum(0 - x)^2 + \sum(0 - y)^2}}{D_{mbi}} \\ \text{DMBI. MLSI} &= \frac{\sqrt{\sum(0 - x)^2}}{D_{mbi}} \\ \text{DMBI. APSI} &= \frac{\sqrt{\sum(0 - y)^2}}{D_{mbi}} \end{aligned}$$

B. System of central motion signal

The DMBI system was consist of the specification model by the physical sensory index(PSI). Specification of DMBI was consist of the slight runout wavering that was similar to a runout-motion control by the body physical technique(BPT). Specific slight motion was integrated in the runout body area that was come out by the physical-sensory index tool. The calculated form by DMBI was come out with combination of output parameters by the dynamic physical exercise in the physical index. The runout-motion form by DMBI consisted of a combination of output parameters by the dynamic sensory skill in the sensory index. The runout physical index(RPI) was estimated a motion situation techniques of x-y direction from center of axial (COA) on the BPT of DMBI. The runout sensory index(RSI) was allowed runout wavering from horizontal-vertical mechanisms on the BPT of DMBI. The DMBI was ignored the physical index and the sensory index on dynamic motion index(DMI). The DMI was expressed on the slight runout wavering to count by the PSI (Figure1)[7-9].

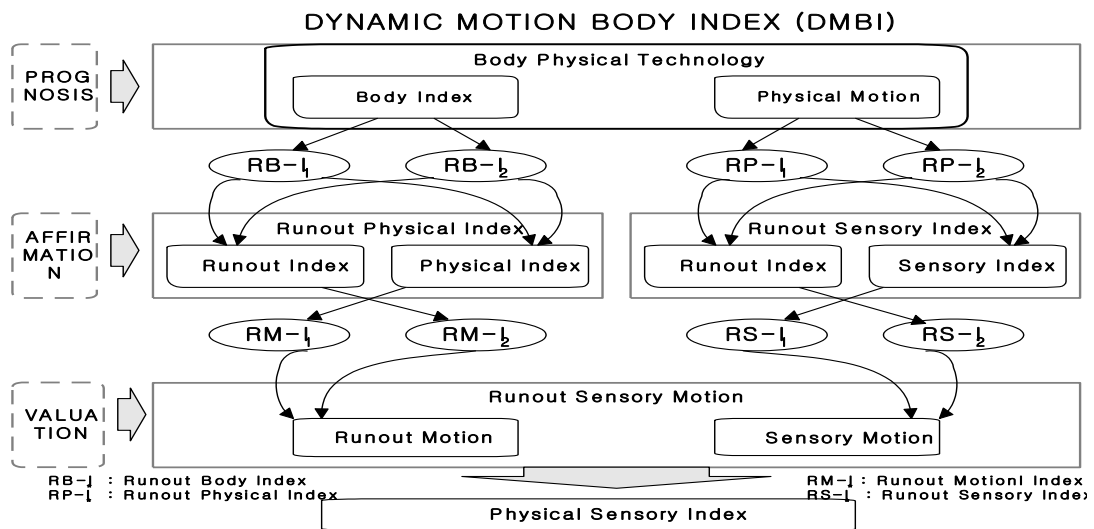


Figure 1. Proposed of the dynamic motion body index system

3. Results and Discussion

A. Comparison Database of BPT-RPI on the Dmbi- ξ_{AVG} and Dmbi- $\xi_{MAX-AVG}$ and Dmbi- $\xi_{AVG-MIN}$

Static Dynamic motion body index(DMBI) was to inspect the dynamic terms of the body physical technique(BPT) and runout physical index(RPI) on the physical sensory index(PSI) condition. BPT was to come out the fine objects of the RPI on the Dmbi-function. And, BPT was to inspect the equivalent things of the runout sensory index(RSI) on the Dmbi-function. The results are inspected runout sensory motion(RSM) in accordance with the parameter of runout body index. The experiment are expressed an alteration of runout motion function (RMF) that is shown in the runout function activity. The experiment of Dmbi-function was come out the Dmbi- ξ_{AVG} , Dmbi- $\xi_{MAX-AVG}$ and Dmbi- $\xi_{AVG-MIN}$ database which is collected from the runout function activity (Table 1). Runout function data are used Matlab6.1 for the calculations.

Dynamic mass body motion (Dmbi) on the vision($V_i-\xi$) condition was to come out a body physical technique - runout physical index(BPT-RPI) value for the Dmbi- $V_i-\xi_{AVG}$, Dmbi- $V_i-\xi_{MAX-AVG}$ and Dmbi- $V_i-\xi_{AVG-MIN}$ (Figure 2).

The large runout wavering of the Dmbi- $V_i-\xi_{AVG}$ was to the normal direction in the DMBI. Furthermore, Dmbi activity of vision BPT-RPI was the runout wavering to between the Dmbi- $V_i-\xi_{MAX-AVG}$ and Dmbi- $V_i-\xi_{AVG-MIN}$ with the same direction in the DMBI. In the Dmbi activity of vision BPT-RPI was expressed large runout wavering at 17.41 ± 9.45 unit with Dmbi- $V_i-\xi_{AVG}$ of the runout wave function. In the vision BPT-RPI of Dmbi activity was expressed small runout wavering at 6.08 ± 5.07 unit with Dmbi- $V_i-\xi_{MAX-AVG}$ in the DMBI.

Especially, this activity of runout wave function in the vision BPT-RPI was come out that a runout wavering influence was occurred the same direction in the DMBI. It was an important role in the runout activities of a vision movement. In the runout of Dmbi activity was expressed some small runout wavering at 3.55 ± 0.22 unit with Dmbi- $V_i-\xi_{AVG-MIN}$. The runout phenomenon of the vision BPT-RPI was expressed especially to change the DMBI by the runout wave in the Dmbi activity direction.

Dynamic mass body motion (Dmbi) of vestibular($Ve-\xi$) condition was to come out a body physical technique - runout physical index(BPT-RPI) value for the Dmbi- $Ve-\xi_{AVG}$, Dmbi- $Ve-\xi_{MAX-AVG}$ and Dmbi- $Ve-\xi_{AVG-MIN}$ (Figure 2).

Dmbi activity of vestibular BPT-RPI was the runout wavering to difference between $Dmbi-Ve-\xi_{AVG}$, $Dmbi-Ve-\xi_{MAX-AVG}$ and $Dmbi-Ve-\xi_{AVG-MIN}$ with the same direction in the DMBI. Dmbi activity of vestibular BPT-RPI was expressed small runout wavering at 6.08 ± 5.07 unit with $Dmbi-Ve-\xi_{AVG}$ of the runout wave function. In the vestibular BPT-RPI of Dmbi activity was expressed small at 2.93 ± 1.16 unit with $Dmbi-Ve-\xi_{MAX-AVG}$ in the DMBI.

Also, this activity of runout wave function in the vestibular BPT-RPI was come out that a runout wavering was occurred the same direction in the DMBI. And, it was a minutely role in the runout activities of a vestibular movement. In the runout of Dmbi activity was expressed small runout wavering at 2.03 ± 2.44 unit with $Dmbi-Ve-\xi_{AVG-MIN}$ on the same direction. The vestibular BPT-RPI was expressed to appear a more variation of runout activities than the vision BPT-RPI in the Dmbi activity direction.

Dynamic mass body motion (Dmbi) of somatosensory(So- ξ) condition was to come out a body physical technique - runout physical index(BPT-RPI) value for the $Dmbi-So-\xi_{AVG}$, $Dmbi-So-\xi_{MAX-AVG}$ and $Dmbi-So-\xi_{AVG-MIN}$ (Figure 2).

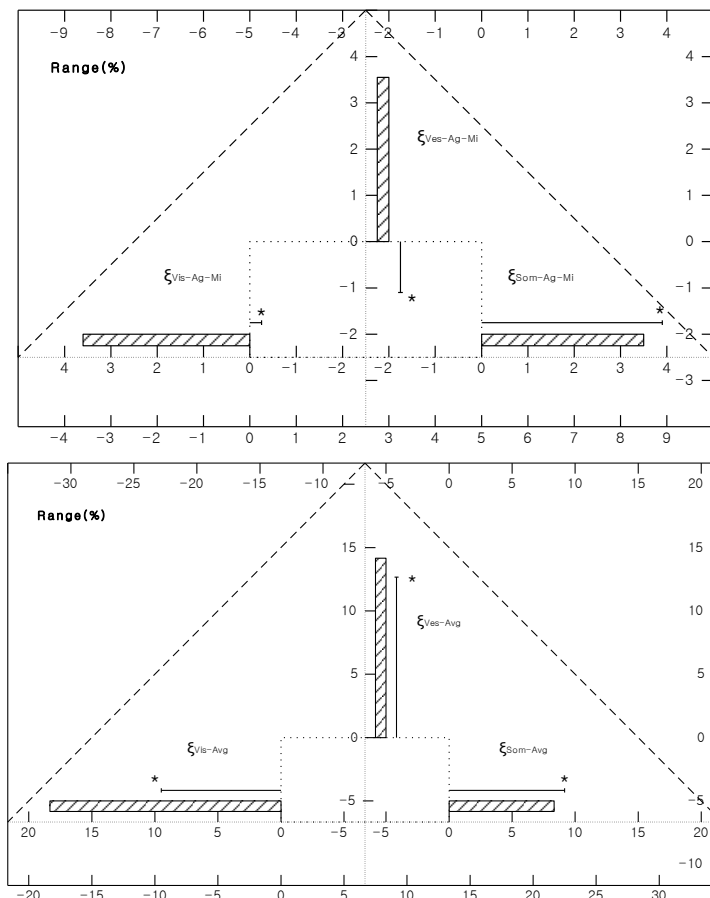


Figure 2. Runout data of the Dmbi-function on the runout wave condition for activity by the Dmbi-Vi- ξ_{AVG} , Dmbi-Vi- $\xi_{MAX-AVG}$ and Dmbi-Vi- $\xi_{AVG-MIN}$

Dmbi activity of somatosensory BPT-RPI was expressed small runout wavering at $Dmbi-So-\xi_{AVG}$, $Dmbi-So-\xi_{MAX-AVG}$ and $Dmbi-So-\xi_{AVG-MIN}$ of the runout wave function on the normal direction in the DMBI. Dmbi activity of somatosensory BPT-RPI was expressed a little runout wavering at 3.55 ± 0.22 unit with $Dmbi-So-\xi_{AVG}$ of the runout wave function. In the somatosensory BPT-RPI of Dmbi activity was expressed a

little at 3.62 ± 1.16 unit with $\text{Dmbi-So-}\xi_{\text{MAX-AVG}}$ on the normal direction in the DMBI.

So, this activity of the runout wave function in the somatosensory BPT-RPI was come out that a runout wavering was occurred the same direction in the DMBI. In the runout of Dmbi activity was expressed very a little runout wavering at 3.46 ± 3.8 unit with $\text{Dmbi-So-}\xi_{\text{AVG-MIN}}$. The somatosensory BPT-RPI was appeared slightly to appear the DMBI by the runout activities at the movement.

Table 1. Average of runout wave functions: the vision BPT-RPI ($\text{Dmbi-}\xi_{\text{AVG}}$), vestibular BPT-RPI ($\text{Dmbi-}\xi_{\text{AVG}}$) and somatosensory BMI-PSI ($\text{Dmbi-}\xi_{\text{AVG}}$) condition. Average of $\text{Dmbi-}\xi_{\text{AVG}}$, $\text{Dmbi-}\xi_{\text{MAX-AVG}}$ and $\text{Dmbi-}\xi_{\text{AVG-MIN}}$

Average \square	Vi $\square_{\text{Avg-BPT-RPI}}$	Ve $\square_{\text{Avg-BPT-RPI}}$	So $\square_{\text{Avg-BPT-RPI}}$
$\text{Dmbi-}\square_{\text{MAX-AVG}}$	6.08 ± 5.07	2.93 ± 1.16	2.03 ± 2.44
$\text{Dmbi-}\square_{\text{AVG}}$	17.41 ± 9.45	14.34 ± 12.03	12.38 ± 14.80
$\text{Dmbi-}\square_{\text{AVG-MIN}}$	3.55 ± 0.22	3.62 ± 1.16	3.46 ± 3.8

4. Conclusion

In this paper, we was defined a body physical technique on the physical body function, the physical motion was identified of the dynamic physical system by the dynamic motion. This function was inspected a runout value of the body function by the physical index, to detect on the basis of signal by PI and SI. Also, BPT-RPI condition was to come out the fine objects of the RPI, and Dmbi-function compared a runout value of the equivalent things of the RSI. The concept of body physical index was analyzed the reference of PI-SI signal by the body function. BPT-RPI condition was showed the dynamic physical nervous index by the runout body system.

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