



## **Change of Psycho-physiological Index by Laughter Yoga: Toward Preventive Effects against Dementia**

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**Abstract:** Laughter Yoga is an operative action not using humor, jokes, etc.; it is laughing from the bottom of the belly (Hearty Laughter, Belly Laughter), sustained for a long-lasting period (Extended Laughter) of 15 to 20 minutes. It is expected that Laughter Yoga has a preventive effect against dementia through increase of oxygen supplied to the body's cells. The author tested 15 persons (3 males, 12 females) and measured their physiological (blood pressure, muscle hardness, stress level) and psychological (TDMS-ST, POMS) indices before and after exercise of Laughter Yoga. A result promising for prevention of dementia, such as a fall of blood pressure, was detected.

**Keywords:** Laughter Yoga, muscle hardness, blood pressure, stress level, TDMS-ST, POMS

### **1. Introduction**

According to the International Classification of Diseases - Classification 10 (ICD - 10)<sup>1)</sup> prepared by the World Health Organization (WHO), dementia is defined as a syndrome due to disease of the brain, usually of a chronic or progressive nature, in which there is disturbance of multiple higher cortical functions, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement. Japan is an aging society not seen anywhere else in the world; in 2017, the number of persons in Japan aged 65 years or older was 7% of the total population. Moreover, it has been estimated that people aged 100 or over will increase to about 66,000, and it is estimated that about 80% of them will have dementia<sup>2)</sup>. Taking countermeasures against dementia has been the most important subject among health professionals, and many kinds of approaches, such as improving eating habits and doing various physical and intellectual training exercises, have been taken to prevent dementia. Also, the author has promoted Laughter Yoga as a preventative practice against dementia<sup>3)</sup>.

Laughter Yoga is an operative action not using humor, jokes, etc.; it is laughing from the bottom of the belly (Hearty Laughter, Belly Laughter), sustained for a long-lasting period (Extended Laughter) of 15 to 20 minutes<sup>4)</sup>. Laughter Yoga is expected to have a preventive effect against dementia by increasing oxygen flow to the body's cells.

In the present study, the author discussed the change of physiological and psychological indices by a group

practice of Laughter Yoga.

### **2. Method**

**Participants:** The study was done in 2016. Participants were 15 persons (3 males, 12 females) 60 years of age and older who were non-dementia members of the author's "Laughter Yoga Club". After they signed an agreement to participate in the present study, the author measured the following indices before and after a group practice of Laughter Yoga.

**Physiological measurements:** Blood pressures and heart rate were measured with the HEM-8101-JE3 (Omron, Japan). Muscle hardness of the rhomboid muscle was measured as an index of level of relaxing of muscle with the Neutone TDM-Z1(RB) (Try-All, Japan). Salivary amylase activity was measured as an index of stress level with the Cocoro Meter (Nipro, Japan). All physiological measurements were repeated three times and those averages were used as valid data.

**Psychological measurements:** Moods of participants were measured by the 2-dimensional mood scale (TDMS-ST) (IMF Co., Ltd., Japan) and Profile of Mood States 2nd Edition (POMS).

### **3. Result**

**Tables 1-3** show the results obtained by Laughter Yoga practice.

**Table 1** summarizes the physiological indices. The average systolic blood pressure decreased from 128.5mmHg to 118.9mmHg after the practice ( $p < 0.05$ ). However, the average diastolic blood pressure did not show a significant change; it went from 80.1mmHg to 74.5mmHg after the practice. Muscle hardness decreased about 50% (from 26.68kg/cm<sup>2</sup> to 13.00kg/cm<sup>2</sup>) and it was



considered to be a relaxing effect of the Laughter Yoga practice ( $p < 0.01$ ).

**Table 1 Physiological indices (n = 15)**

	Before	After	Change rate
Systolic blood pressure [mmHg]	128.5	118.9	-7.47%
Diastolic blood pressure [mmHg]	80.1	74.5	-6.99%
Muscle hardness [kg/cm <sup>2</sup> ]	26.68	13.0	-51.27%
Stress level (Salivary amylase activity) [kIU/L]	35.29	13.57	-61.54%

Scores of TDMS-ST, shown in **Table 2**, were improved, moving toward the direction of a good state for vitality, stability, and pleasure.

**Table 2 Differences of scores of TDMS-ST (n = 15) before and after practice**

	Vitality	Stability	Pleasure	Arousal
Difference	4	4	8	0

\* All scores are rounded off.

There were significant interactions among all subordinate scales. Scores of TA (tension-anxiety), D (depression-dejection), A-H (anger-hostility), F (fatigue), and C (confusion) decreased, and the score of V (vigor) increased (**Table 3**).

**Table 3 Scores of POMS (n = 15)**

	Before	After	Difference
TA (Tension-Anxiety)	8.6	2.9	-5.7
D (Depression-Dejection)	5.67	1.87	-3.8
A-H (Anger-Hostility)	3.7	1.0	-2.7
V (Vigor)	5.87	10.9	5.03
F (Fatigue)	8.87	3.6	-5.27
C (Confusion)	8.0	4.0	-4.0

### 3. Discussion and Conclusion

Generally, there is a tendency that elder persons do not have enough chances to laugh and they are poor at laughing intentionally. In the present study, the participants changed their mind-body states to relaxing and vital states through the actions of Laughter Yoga. The findings suggested a possibility of recovering brain functions since laughter activates the brain and makes the brain relax.

The present study was a short-term experiment and its sample size was small. Therefore, brain functions should be measured by fMRI, PET, MEG, etc. and a long-term study is needed. By developing research on Laughter Yoga, the author will try to raise the ADL and QOL of elderly people and aim at realization of a protracted-life society in which everyone can be healthy and have a heartfelt life.

### References

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## 笑いヨガによる生理・心理指標の変化

— 認知症の予防を目指して —

(Change of Psycho-physiological Index by Laughter Yoga: Toward Preventive Effects against Dementia)

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**要旨:** 笑いヨガは、ユーモアやジョーク等を用いずに腹の底から笑う動作を 15~20 分間続ける操作的な笑いである。笑いヨガは細胞への酸素の供給量が増えるので認知症の予防効果も期待されている。筆者は 60 歳以上の 15 名 (男性 3 名、女性 12 名) を対象にして、笑いヨガの前後に生理的指標 (血圧、筋硬度、ストレス度) と心理的指標 (2 次元気分尺度、日本語 POMS 短縮版) を測定した。結果、血圧の低下など認知症の予防に有益な変化が見られた。

**キーワード:** 笑いヨガ、筋硬度、血圧、ストレス度、2 次元気分尺度、日本語 POMS 短縮版

### 1. 緒 論

世界保健機構 (WHO) 作成の国際疾病分類第 10 版 (ICD-10) によると、認知症とは、「通常、慢性あるいは進行性の脳疾患によって生じ、記憶、思考、見当識、理解、計算、学習、言語、判断等多数の高次脳機能の障害からなる症候群」と定義されている<sup>1)</sup>。2017 年現在、日本は人口の 7% が 65 歳以上という世界に例を見ない超高齢化社会となっている。特に、2025 年には 100 歳以上の人が 66,000 人になり、そのうちの約 8 割が認知症と推定されていることから<sup>2)</sup>、認知症対策は喫緊の課題となっている。現在、食生活の改善や各種の運動・知的作業によって認知症の発症を予防する試みが各地で行われているが、筆者も高齢者向けの認知症予防健康法として笑いヨガ<sup>3)</sup>の実践に取り組んでいる。

笑いヨガは、ユーモアやジョーク等を用いない操作的で、腹の底から笑い (Hearty Laughter, Belly Laughter)、かつ長く続ける持続的な笑い (Extended Laughter, 15~20 分) である<sup>4)</sup>。笑いヨガは細胞への酸素の供給量が増えるので認知症の予防効果も期待されている。本研究は、集団で笑いヨガを実践したときの心理的・生理的変化を検討した。

### 2. 方 法

**被験者:** 筆者の主催する「Laughter Yoga club」の 60

歳以上の非認知症の 15 名 (男性 3 名、女性 12 名) を対象に、2016 年、笑いヨガを集団で実施した。参加者全員の承諾を得た上で、セッション前後に次の測定を実施した。

**生理測定:** 血圧・脈拍の測定 (自動血圧計 HEM-8101-JE3、オムロン社)。筋肉のリラクセス度の指標として背部 (菱形筋) の筋硬度を測定 (NEUTONE デジタル表示式筋 (軟部組織) 硬度計、Try-All 社)。ストレス度の指標として唾液アミラーゼ活性値を測定 (Cocoro Meter、ニプロ社)。生理測定はいずれも 3 回測定し、その平均値を測定値とした。

**心理測定:** 心の活性度と安定度を 2 次元気分尺度 (TDMS-ST、アイエムエフ社) と日本語 POMS 短縮版で測定した。

### 3. 結 果

笑いヨガ実施前後の各測定の結果を以下に示す (Tables 1-3)。

収縮期血圧の平均値は、セッション前後において、それぞれ 128.5mmHg、118.9mmHg となり、有意差が認められた ( $p < 0.05$ )。拡張期血圧はセッション前後で、それぞれ 80.1mmHg、74.5mmHg となり、有意差は認められなかった。

筋硬度計では、実施前 26.68kg/cm<sup>2</sup> から実施後 13.00kg/cm<sup>2</sup> と 50% の減少があり、リラクセス効果が認められた ( $p < 0.01$ )。



**Table 1 生理測定の結果 (n = 15)**

	前	後	変化率
収縮期血圧 [mmHg]	128.5	118.9	-7.47%
拡張期血圧 [mmHg]	80.1	74.5	-6.99%
筋硬度 [kg/cm <sup>2</sup> ]	26.68	13.0	-51.27%
ストレス度 (唾液アマラーゼ活性度) [kIU/L]	35.29	13.57	-61.54%

また、TDMS-ST (2次元気分尺度) では、活性度 (活力があるか、気分が出ないか)、安定度 (落ち着いているか、イライラしているか)、快適度 (明るい気分なのか、暗い気分なのか) において得点の改善が見られた (Table 2)。

**Table 2 TDMS-ST の増減 (n = 15)**

	活性度	安定度	快適度	覚醒度
増減	4	4	8	0

\* 各得点は四捨五入したもの。

POMS では、全ての下位尺度において有意な交互作用が見られた。TA の緊張・不安、D の抑うつ・落ち込み、A-H の怒り・敵意、F の疲労が減少し、V の活気が増加した。また、C の混乱も鎮静化が見られた (Table 3)。

**Table 3 日本語 POMS 短縮版の結果 (n = 15)**

	前	後	増減
TA (緊張・不安)	8.6	2.9	-5.7
D (抑うつ・落ち込み)	5.67	1.87	-3.8
A-H (怒り・敵意)	3.7	1.0	-2.7
V (活気)	5.87	10.90	5.03
F (疲労)	8.87	3.60	-5.27
C (混乱)	8.0	4.0	-4.0

### 3. 考察及び結論

高齢者はユーモアや冗談に反応して笑う機会が少なく随意的笑いが不得意であるが、本実験から、笑いヨガによる動作や表情の変化によって被験者がストレスが軽減された活気に満ちた状態に変化することが示された。「笑う門に福来たる」の言葉があるように、笑いは脳の「リラックス」と共に脳

の働きも良くすると考えられることから、笑いヨガによって脳機能の回復が期待できるだろう。

なお、本研究は実験規模が小さく、また短期効果の測定であることから、fMRI, PET, MEG 等の脳機能測定を導入や追跡調査による長期効果の検証が必要である。今後、さらに笑いヨガの研究を進展させることで、高齢者の ADL や QOL を向上させ、人々が心豊かで健全に過ごせる長寿社会の実現を目指したい。

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