

Original**Applicant Needs, Reasons for Declining Health Counseling, and Requests regarding Health Promotion Services as Stratified by Specific Health Checkup Results and Abdominal Obesity Classification**Tomotaro Dote¹⁾ and Shin Nakayama²⁾¹⁾Department of Public Health, Faculty of Nursing, Osaka Medical College²⁾Department of Hygiene and Public Health, Division of Preventive and Social Medicine, Faculty of Medicine, Osaka Medical College

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Abstract

This study aimed to investigate the needs for specific health guidance (SHG), reasons for declining SHG, and requested services for health promotion among SHG applicants according to specific health checkup (SHC) support level and abdominal obesity. A total of 275 male employees ≥ 40 years old who underwent SHCs in 2012 were stratified into three support levels. Visceral fat measurements were taken via bioimpedance analysis, and participants were divided into four categories according to their abdominal obesity status (non-obese, apparent obesity, potential obesity, and visceral obesity) using combination of visceral fat volume and waist circumference. They were further classified into three groups (morbid, pre-morbid, and normal) based on the combination of three support levels and four categories. Questionnaires were administered to collect data about participant willingness to receive health counseling, their needs when applying for SHG, reasons why non-applicants declined SHG, and requests for health management and healthy lifestyle promotion. Response percentages were compared across the three groups. The most common applicant need was “An explanation of the results that is easily understood and implemented”. While the most common reason for declining SHG was “I am self-motivated and do not require assistance.” The percentage of declining was significantly lower in the morbid group than in pre-morbid and normal groups. Our study revealed that a clearer explanation on how to interpret SHC results is required. In particular, incentives for the morbid group should be created to motivate personal control or self-efficacy, such as setting their own health related goals.

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—Key words—

specific health checkups, health guidance, visceral fat obesity

Introduction

According to the Ministry of Health, Labour and Welfare (MHLW), specific health checkup (SHC) data from 2011 revealed that 26.8% of all insured individuals in all of the various types of health insurance plans in Japan had either metabolic syndrome (MetS) or pre-MetS, the rates of which had declined by only 0.19% since 2008¹⁾. In a previous study of university employees (males, ≥ 40 years old) who underwent SHCs as implemented by a mutual aid insurance union, we observed no remarkable change in the percentages of employees with MetS or pre-MetS from 2008 to 2011²⁾. Some reports indicate that more than 20% of healthy, middle-aged Japanese men with a waist circumference ≥ 85 cm would be considered to have visceral fat obesity³⁴⁾. Waist circumference (WC) is a mandatory criterion of MetS used to evaluate abdominal obesity in Japan⁵⁾. However, WC does not necessarily reflect abdominal fat accumulation, as it is affected by subcutaneous fat. Bioelectrical impedance analysis (BIA), used worldwide, estimates visceral fat volume more accurately than WC⁶⁷⁾. Therefore, in a previous study, we surveyed health awareness, stage of change, and application for specific health

Table 1 Distribution of participants (275 males) in the various obesity categories according to waist circumference (WC) and visceral fat level (VFL), and according to obesity categories and support levels as determined by specific health checkups

Obesity category	Cut-off points for two parameters	Percentage (n)	Obesity category	Support level		
				PSL	MSL	CB
Non-obese	WC<85 cm and VFL<10	30.9% (85)	Non-obese	none	none	30.9% (85)
Apparent obesity	WC≥85 cm and VFL<10	0% (0)	Apparent obesity	none	none	none
Potential obesity	WC<85 cm and VFL≥10	24.4% (67)	Potential obesity	none	1.5% (4)	22.9% (63)
Visceral obesity	WC≥85 cm and VFL≥10	44.7% (123)	Visceral obesity	27.3% (75)	8.7% (24)	8.7% (24)
Total				27.3% (75)	10.2% (28)	62.5% (172)

WC, Waist circumference; VFL, Visceral fat level measured using the BIA analyzer; PSL, Positive support level; MSL, motivational support level; CB, clean bill of health. A VFL of 10 is equivalent to a visceral fat area value of 100 cm².

guidance (SHG) according to both SHC stratification and visceral fat obesity as measured by BIA⁸. Specific health guidance (SHG) is provided to those who apply for it after SHCs, and thus the implementation rate (IR) for SHG indicates the percentage of SHC participants who received SHG. In 2011, the MHLW reported 17.8% and 15.9% for SHG application and IR, respectively, in 23.6 million SHC participants⁹. Currently, requests for SHG are made only by answering Yes/No questions in the questionnaire which comprises part of the “Standard Program of MRHC and SHG” initiated by the MHLW¹⁰. However, effective health promotion requires a more specific survey of applicant needs and their reasons for declining SHG. As our previous study examined anticipated results, reasons for declining or accepting SHG, and specific needs of applicants in the workplace according to gender and age group¹¹, the present study aimed to analyze these items according to both SHC results and abdominal obesity levels among middle-aged males.

Participants and Methods

Participants

Total body composition analysis was performed for all study participants, which comprised a total of 275 male employees ≥40 years of age (mean ± SD, 53.3 ± 8.6 years) of a private university (not a medical school) in Japan who conducted primarily sedentary work. Any individual who had not received a comprehensive medical examination underwent an annual SHC, as implemented by the university’s mutual aid insurance union in 2012.

Measurement of body composition

Visceral fat levels (VFLs) were measured by BIA using a Body Composition Analyzer (MC-190; Tanita Corp., Tokyo, Japan). Recommended BIA measurement conditions were explained to each participant and the following instructions were provided: (1) fast for four hours and do not drink alcohol for eight hours prior to measurement; (2) empty bladder prior to measurement; and (3) do not exercise for eight hours prior to measurement¹². Participants were instructed to stand on the footplate and grasp the handgrip with electrodes. Current emitted from the electrodes through the feet and hands was detected at the heels and palms. The Body Composition Analyzer applies electricity at frequencies of 5, 50, 250, and 500 kHz throughout the body. Whole body impedance was then measured using a bilateral foot-hand electrical pathway. This analyzer automatically calculates percent body fat using equations preprogrammed by the manufacturer. The coefficient of variation for BIA measurements was 0.4%, as determined by five repeated measurements in seven adult participants. VFLs ranging from 1 to 59 were translated into values. For example, level 10 is equivalent to a visceral fat area (VFA) value of 100 cm². According to Japanese diagnostic criteria, WCs of 85 cm in men and 90 cm in women are equivalent to a VFA value of 100 cm² as determined by computed tomography (CT)¹³.

WC and VFL groups (Table 1)

Participants were divided into the following obesity categories: non-obese (WC <85 cm and VFL <10), apparent obesity (WC ≥85 cm and VFL <10), potential obesity (WC <85 cm and VFL ≥10), and visceral obesity (WC ≥85 cm and VFL ≥10). Both potential obesity and visceral obesity groups were assumed to have increased amounts of visceral fat.

Table 2 Distribution of participants (275 males) by morbidity categories as assessed by obesity and specific health checkup support level

Obesity category	Support level	Morbidity category (n)	Mean age (SD)
Non-obese	CB	Normal: 31% (85)	48.8 (7.2)
Potential obesity	CB	Pre-morbid: 33% (91)	56.6 (8.3)
Visceral obesity	MSL		
Visceral obesity	CB	Morbid: 36% (99)	54.2 (8.5)
	PSL		
	MSL		

Age: The normal group was significantly different from both the pre-morbid and morbid groups ($p < 0.01$ for both comparisons, Tukey-Kramer method). PSL, Positive support level; MSL, motivational support level; CB, clean bill of health

Clinical data

Blood levels of the following were collected after a 12-hour fasting period: triglycerides (TG, mg/dL: enzymatic method by analytical chemistry), high-density lipoprotein cholesterol (HDL-C, enzymatic method by analytical chemistry), low-density lipoprotein cholesterol (LDL-C, mg/dL: $LDL-C = TG - [HDL-C + TG/5]$), and glucose (glucose oxidase method according to the Japan Diabetes Society). Blood pressure (BP, mmHg) was also measured. WC was measured as the minimum circumference at the level of the umbilicus to the nearest 0.5 cm at the end of normal expiration.

SHC criteria and stratification of groups

The following parameters noted within the SHC criteria were examined: (1) waist circumference (WC) ≥ 85 cm for men and ≥ 90 cm for women; (2) body mass index (BMI) ≥ 25 ; (3) systolic blood pressure (BP) ≥ 130 mmHg, diastolic BP ≥ 85 mmHg, or use of hypertension medications; (4) fasting plasma glucose levels ≥ 100 mg/dL, HbA1c (JDS)(%) ≥ 5.2 , or current treatment for diabetes mellitus (DM); (5) triglycerides (TG) ≥ 150 mg/dL and/or high-density lipoprotein cholesterol (HDL-C) < 40 mg/dL, or use of hyperlipidemia medications and smoking history based on a smoking index score ≥ 100 and/or smoking status in 2011. Three support levels were stratified by combining these parameters. The positive support level (PSL) included (1) and two or more from (3), (4), and (5); or (2), (3), (4), and (5); or (1) and one from (3), (4), and (5) plus smoking history; or (2) and two from (3), (4), and (5) plus smoking history. The motivational support level (MSL) included one from (3), (4), and (5) plus no smoking history; or (2) and two from (3), (4), and (5) plus no smoking history; or (2) and one from (3), (4), and (5). Any other parameter combinations were categorized as a healthy level with a clean bill of health (CB)¹⁰.

Classifying combinations of support levels and obesity categories

Participants were classified by their SHC results, WC, and visceral fat level (Table 2). The normal group comprised those in the non-obese group with CB. The pre-morbid group comprised those in the potential obesity group with MSL, those in the potential obesity group and CB, or those in the visceral obesity group with CB. The morbid group comprised those in the visceral obesity group with PSL or those in the potential group with MSL.

Questionnaires regarding participant willingness to receive SHG

A self-administered questionnaire was also provided to all study participants. Data regarding requests for SHG were collected using the questionnaire comprising part of the "Standard Program of MRHC and Health Counseling" initiated by the MHLW¹⁰.

Questionnaire on applicant needs with regard to SHG and non-applicants declining SHG

Yes/no answers with regard to applicant requests for SHG are displayed in Table 3. Participants who accepted SHG were asked to select one or more of the five options to describe their needs with regard to SHG (Table 3). Multiple selections could be made, and the percentages of participants that selected each option were compared across gender and age groups.

Participants who declined SHG were asked to select one or more of the five options to describe why they chose to do so (Table 3). Multiple selections could be made, and the percentages of participants that selected each option were compared across gender and age groups.

Table 3 Yes-no answers regarding specific health guidance (SHG) in the standard questionnaire distributed as part of the Specific Health Checkup implemented by the Ministry of Health, Labor and Welfare. Multiple choices are listed for those who accepted SHG ('Yes') or declined it ('No')

To those who chose 'Yes':

What specific needs do you have? (choose from the options below)

- a. An explanation of the results that is easily understood and implemented
- b. Guidance on how to address obesity and/or waist circumference
- c. Counseling to address physical decline
- d. Counseling for mental stress and/or health concerns
- e. Guidance on how to modify unhealthy lifestyles

To those who chose 'No':

Why did you choose to decline SHG? (choose from the options below)

- i. I am self-motivated and do not require assistance.
- ii. I do not plan to make any lifestyle modifications.
- iii. I have no interest in the SHC results or am not anxious about my health.
- iv. It may be effective for me, but I am too busy with work.
- v. SHG is ineffective and unnecessary for me.

Table 4 Questionnaire about requests for services to assist you in your health management and promotion of a healthy lifestyle

Please select any and all of the following items which you believe would help you modify your unhealthy lifestyle if they were available.

1. support from family and friends with regard to dietary assistance and physical activity outside the workplace
2. peer support/mutual encouragement to promote healthy lifestyles at the workplace
3. a sympathetic workplace policy to promote employee health (e.g., overwork prevention, encouragement of paid vacation time)
4. Face-to-face counseling with health professionals who would consider each individual's situation
5. periodic measurement of physical parameters (e.g., weight, waist circumference, and body composition)
6. readily available health information seminars to improve participant understanding of health concerns

Questionnaire regarding participant requests regarding health management and promotion of healthy lifestyle

Participants were asked to select one of the six options to describe their requests with regard to services to assist them in their health management and promotion of a healthy lifestyle (Table 4). Multiple selections were possible, and the percentages of participants that selected each option were compared across gender and age groups.

Statistical analysis

Pearson's χ^2 test was used to analyze categorical variables among normal, pre-morbid, and morbid groups. Statistical analysis was performed using SPSS[®] 12.0 J software (SPSS Inc., Chicago, IL), with the statistical significance set at $p < 0.01$.

Ethical considerations

This study was approved by the Ethics Committee of the Osaka Medical College (No. 679). Written and oral explanations were provided, and informed consent was obtained from each participant. Anonymity was ensured to protect personal information.

Results

Table 1 shows the distribution of participants in each obesity category as well as the combination of obesity categories and support levels. Percentages of participants in the potential obesity and visceral obesity groups were 24.4% and 44.7%, respectively, with 27.3% and 10.2% at the PSL and MSL, respectively. Those at the PSL in the visceral obesity group comprised 27.3%, while 22.9% were in the potential obesity group with CB. Those in the non-obese group with CB comprised 30.9%.

Percentages of participants in the morbid and pre-morbid groups were 36% and 33%, respectively (Table 2). Table 5 shows the distribution of services requested by SHG applicants, who represented 46.9% (129/275) of

Table 5 Services requested by health counseling applicants

	Percentage of participants who selected each option				
	a	b	c	d	e
Normal (37)	35.1%	13.5%	5.4%	32.4% **	8.1%
Pre-morbid (48)	29.2%	25.0%	14.6%	2.1% **	8.3%
Morbid (44)	25.0%	20.5%	9.1%	2.3% **	0.0%

a. An explanation of the results that is easily understood and implemented

b. Guidance on how to address obesity and/or excess waist circumference

c. Counseling to address physical decline

d. Counseling for mental stress and/or health concerns

e. Guidance on how to modify unhealthy lifestyles

** $p < 0.01$ (Pearson's χ^2 test)

Normal, those in the non-obese group with CB; Pre-morbid, those in the potential obesity group with MSL, those in the potential obesity group with CB, or those in the visceral obesity group with CB; Morbid, those in the visceral obesity group with PSL or those in the potential group with MSL

Table 6 Reasons why non-applicants declined health counseling.

	Percentage of participants who selected each option				
	i	ii	iii	iv	v
Normal (48)	35.40%	0%	6.2%	10.4%	0%
Pre-morbid (43)	46.5%	7.0%	2.3%	4.7%	0%
Morbid (55)	25.5% **	9.1%	7.3%	3.6%	0%

i. I am self-motivated and do not require assistance.

ii. I do not plan to make any lifestyle modifications.

iii. I have no interest in the SHC results or am not anxious about my health.

iv. It may be effective for me, but I am too busy with work.

v. Health counseling is ineffective and unnecessary for me.

** $p < 0.01$ (Pearson's χ^2 test)

Normal, those in the non-obese group with CB; Pre-morbid, those in the potential obesity group with MSL, those in the potential obesity group with CB, or those in the visceral obesity group with CB; Morbid, those in the visceral obesity group with PSL or those in the potential group with MSL

all study participants. Of the population of SHG applicants, 29.7% (37/129), 37.2% (48/129), and 34.1% (44/129) were in the normal, pre-morbid, and morbid groups. The most commonly selected option across all groups was "An explanation of the results that is easily understood and implemented," followed by "Guidance on how to address obesity and/or excess waist circumference" in the pre-morbid and morbid groups. The percentage of "Counseling for mental stress and/or health concerns" was apparently higher in the normal group than in other two groups.

Applicants declined SHG due to reasons listed in Table 6. Of all study participants, 53.1% (146/275) chose to decline SHG, which could be broken down to 32.9% (48/146), 29.4% (43/146), and 37.7% (55/146) in the normal, pre-morbid, and morbid groups, respectively. The most commonly selected reason was "I am self-motivated and do not require assistance" across all groups. The percentage was significantly lower in the morbid group than in morbid and pre-morbid groups. Less than 5% each in the pre-morbid and morbid groups selected "It may be effective for me, but I am too busy with work" as a reason for declining SHG.

Fig. 1 displays the distribution of participant requests regarding services to assist them in their health management and promotion of healthy lifestyle. The most commonly selected option by those in the morbid group was "support from family and friends with regard to dietary assistance and physical activity outside the workplace," followed by "peer support/mutual encouragement to promote healthy lifestyles at the workplace." Meanwhile, a lower percentage of the morbid group selected "a sympathetic workplace policy to promote employee health (e.g., overwork prevention, encouragement of paid vacation time)," relative to that in the normal and pre-morbid groups. The least popular request was "readily available health information seminars to im-

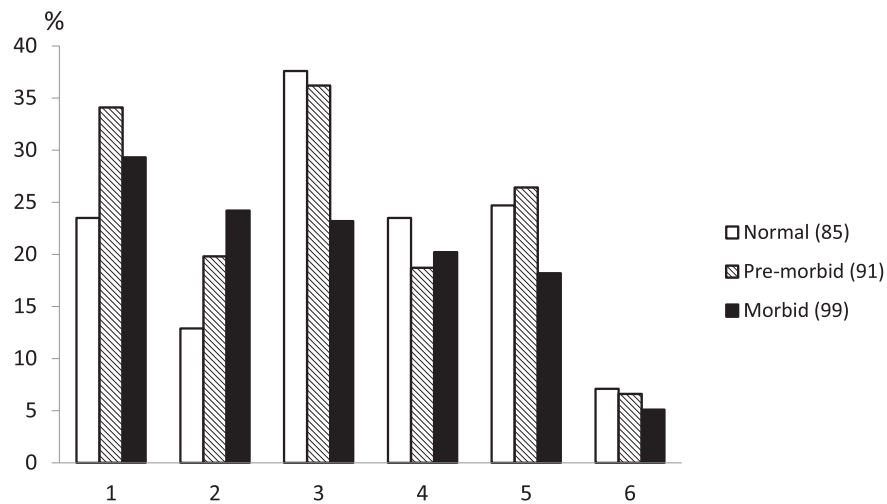


Fig. 1 Distribution of participant requests regarding services to assist them in their health management and promotion of healthy lifestyles

1. support from family and friends with regard to dietary assistance and physical activity outside the workplace
2. peer support/mutual encouragement to promote healthy lifestyles at the workplace
3. a sympathetic workplace policy to promote employee health (e.g., overwork prevention, encouragement of paid vacation time)
4. face-to-face counseling with health professionals who would consider each individual's situation
5. periodic measurement of physical parameters (e.g., weight, waist circumference, and body composition)
6. readily available health information seminars to improve participant understanding of health concerns

prove participant understanding of health concerns.”

Discussion

As shown in Table 1, potential obesity and visceral obesity groups comprised 69.1% of our study participants (mean age, 53.3 years). Others have reported that visceral fat area increased 42.9% in an age-dependent manner among Japanese men aged 40 to 79 years¹⁴. Another retrospective cohort study showed a high incidence of MetS, not only in the group with a waist circumference ≥ 85 cm, but also among those without abdominal obesity who fulfill two or more criteria for MetS¹⁵. Previously, we reported that the percentage of men aged ≥ 40 years at the PSL significantly increased from 2008 to 2011⁹. Thus, efforts to promote preventive health care should consider aging and other components such as blood pressure, serum glucose, and lipid levels, in addition to visceral fat volume.

In the present study, 27.3% of participants were in the visceral obesity group at the PSL (Table 1). Those in the potential obesity group comprised 22.9%, even with CB in 2012. In fact, the majority of those in the potential obesity group had a CB. Our 2011 study of 314 male employees revealed that 22.9% were in the potential obesity group¹⁶. Furthermore, 8.7% of participants were in the visceral obesity group at the CB (Table 1). In other words, 31.6% of participants with excessive visceral fat were still given a CB according to SHC results.

The most commonly requested service among SHG applicants was “An explanation of the results that is easily understood and implemented” (Table 5). This indicates that an increased awareness of lifestyle-related diseases is required by those who are unfamiliar with such diseases, and those with poor health require more detailed information¹⁷. However, as participants varied in their medical knowledge, initiative, and lifestyles, each counselor must use discretion and explain the SHC results based on each individual's needs¹⁸. Given the number of abnormalities and variability in other details in the SHC results, clearer instructions on how to interpret these are highly necessary.

The second most common request among SHG applicants was “Guidance on how to address obesity and/

or excess waist circumference,” particularly among those in the pre-morbid and morbid groups. A survey by NHK (Japan Broadcasting Corporation) reported that 35% of Japanese men and 44% of women considered themselves obese, and 94% of these planned to lose weight¹⁹, suggesting that respondents were likely conscientious of their body shape as well as their health.

In the normal group, the most common request was “Counseling for mental stress and/or health concerns” (Table 5). Even these healthy young adults were somewhat anxious about their health and willing to receive health guidance, especially given the MetS pandemic²⁰. Thus, even healthy individuals may wish to gather health information to maintain their good health.

The most frequent reason applicants gave for declining SHG was “I am self-motivated and do not require assistance” (Table 6). Habitual self-control is reportedly a useful construct in research on health behavior management, particularly when long-term maintenance of health behavior is desired²¹. However, the morbid group comprised the lowest percentage of participants. Therefore, incentives for the morbid group should be created to motivate personal control or self-efficacy, such as setting their own health related goals and approaching them in a step-wise manner²².

In 2010, the Ministry of Health, Labor and Welfare (MHLW) in Japan reported the national status for attending health checkup consultations and/or complete medical checkups in their Comprehensive Survey of Living Conditions²³. The most frequently noted reasons for non-attendance were “I am too busy and have no time for consultation” among males in their 30s to 50s and “I can get medical help anytime, if the need arises” in males over 60. Various perceived barriers such as costs and time were noted as potential factors which might prevent the utilization of medical knowledge in daily life, even if working individuals acquired a great deal of medical information¹⁸. In the present study, this reason was not cited as frequently (Table 6), perhaps due to the fact that we conducted a voluntary survey and most of our participants may have been relatively conscientious about their health management.

The most commonly requested services among those in the morbid groups were “support from family and friends” and “peer support/mutual encouragement” (Fig. 1). Provision of these social support systems may require the active collaboration of family members to make sustainable changes in order to help fulfill difficult individual goals such as weight loss²². Effective health guidance should consider the various needs of individuals with regard to social support.

The percentage of those in the morbid group that selected “a sympathetic workplace policy to promote employee health” as a requested service was lower than that in the normal and pre-morbid groups (Fig. 1).

The morbid group would be affected by their various barriers such as family situation, job type, and living environment. Then, the workplace policies for the protection and promotion of wellbeing would vary according to their organizations. They might be passive about using the policies, because they did not understand how to fully utilize them for their own cases. Therefore, Practical advices should be also provided for the specific conditions of individual with regard to workplace policy by health care providers. The least frequently selected service was health information seminars (Fig. 1). The MHLW has publicized their “Physical activity standards and guidelines for Japanese health promotion in 2013”²⁴, but these remain unfamiliar to most of the nation, including health care providers. Thus, attempts by the MHLW to keep the nation informed about these standards should be fortified by efforts among private health providers and managers to conduct more frequent dissemination of these updates.

Limitations

Due to the voluntary nature of the survey, some selection bias may exist in that most participants of the present study did not consider the health checkups as a mere obligation, and displayed initiative to use the results to improve their lifestyles. Nationwide generalizations may be difficult to make from the present study results, as the study population comprised those who conduct primarily sedentary activities. Finally, BIA is a useful method for measurement of skeletal muscle, but is limited in its ability to measure visceral fat as compared to MRI or CT.

Conclusion

Effective health promotion requires each individual to set their own health-related goals and to take initiative to fulfill these. Clearer instructions on how to interpret SHC results, particularly for those who would be classified in the morbid group, are required.

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特健階層と腹部肥満区分別の保健指導の要望、拒否理由、 生活習慣改善の有効要因の検討

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—キーワード—

特定健康診査, 保健指導, 内臓脂肪肥満

目的：特定健診の支援レベルおよび腹部肥満状況に基づき、特定保健指導へのニーズ、特定保健指導を希望しない者の理由および特定保健指導を希望する者が健康増進のために要望したサービスを検討することが本研究の目的である。

方法：2012年に特定健診を受けた275名の40歳以上の男性を3つの支援レベルに階層化した。次に内臓脂肪は生体インピーダンス法で測定し、内臓脂肪量と腹囲の組み合わせから、腹部肥満状況を4つにカテゴリー化（腹部肥満でない、見た目肥満、隠れ肥満、内臓肥満）した。さらに3つの支援レベルと4つのカテゴリーに基づき、3群（病的群、予備群、正常群）に分けた。アンケートは保健指導への意思、指導を受ける際のニーズ、指導を受けない場合の理由、受ける場合の健康管理や健康的な生活習慣増進のための要望について実施。回答結果を3群間で比較した。

結果：全群において保健指導を希望する者の最も多いニーズは「理解しやすい説明の実施」であった。一方、保健指導を希望しない最も多い理由は「自分でモチベーションを高めるので指導はいらない」であった。その希望しない理由の割合は病的群が予備群、正常群に比し高かった。

結論：本研究により特定健診結果の解釈についてより明確な説明が要望されていることが示された。特に病的群に対しては、自分自身に関連する健康目標を設定するような、自己制御力や自己達成感を生じさせる指導がなされるべきである。

利益相反：利益相反基準に該当無し

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