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The Dutch periodontal screening index validation and its application in The Netherlands

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Abstract

Objective: To provide evidence that the Dutch periodontal screening index (DPSI) is a valuable tool for the screening of the periodontal status and to evaluate the application of the DPSI by general practitioners in the Netherlands.

Material and methods: To assess the validity of the DPSI, an available data set was used consisting of 131 subjects with various degrees of periodontal breakdown in whom plaque, calculus, pocket depth, bleeding on probing and attachment loss was evaluated at all inter-proximal sites. The application of the DPSI in general practice was studied in a random sample of 300 practising dentists in the Netherlands by means of a questionnaire.

Results: Full-mouth inter-proximal measurements showed that 19.1% of the subjects had $\geqslant$6 mm attachment loss at $\geqslant$2 sites. The DPSI identified 100% of the subjects with this condition. The results of the survey questionnaire showed that about 75% of the general dental practitioners were applying the DPSI, although only 15.1% were performing this consistently when a regular check-up was performed. The mean time required for the assessment of the DPSI was 3 min.

Conclusion: The DPSI is valuable tool for the screening of the periodontal condition during general dental check-ups.

Key words: attachment loss; diagnosis; periodontal screening

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Over the last two decades, epidemiological studies have shown a trend towards a lower prevalence of periodontitis in recent years, although still about 5–10% of the population suffers from severe periodontitis (Hugoson & Norderyd 2008). Because at present, still no reliable prognostic indicators exist, regular clinical examination of all individuals in a population is needed to detect/diagnose periodontitis in a phase when treatment still has a good prognosis. The population size and the frequency (e.g. once a year) of the required examination dictate that such examinations must be carried out within the general dental practice setting. However, an extensive full-mouth periodontal examination is time consuming and costly. Therefore, Croxson (1984) suggested that the community periodontal index of treatment needs (CPITN) could be used as a tool for a simplified periodontal screening examination in general dental practice. The CPITN is, in principle, an epidemiological method and originally based on the index teeth (Ainamo et al. 1982). However, when partial recordings are used, an underestimation of the prevalence of periodontitis will always occur (Ainamo 1984). Therefore, when an individual is examined, it is more appropriate to use a full-mouth evaluation. The idea to use the CPITN as a screening method in general dental practice has been adopted in the late 1980s. Because the CPITN includes only signs of inflammation, calculus and pocket depth, several modifications have been suggested.

A basic periodontal examination (BPE) was recommended by the British Society of Periodontology (BSP) (1986, 2001). This index includes the same scoring codes as the CPITN, but the symbol * is added to a sextant if there is attachment loss at any site $\geqslant$7 mm or if a furcation is probable. The American Dental Association (ADA) and the American Academy of Periodontology (AAP) (1992) introduced another modification of the CPITN, the periodontal screening and recording (PSR) index.

Conflict of interest and source of funding statement

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This index uses the same scoring codes as the CPITN as well, but the symbol * should be added to the sextant score whenever individual findings indicate clinical abnormalities such as furcation involvement, mobility, mucogingival problems and recession $\geqslant$3.5 mm. Obviously, the modifications of the CPITN by the BSP and the ADA/AAP are attempts to include the degree of attachment loss in the original CPITN.

In the Netherlands, a periodontal diagnosis and treatment protocol was introduced in 1998 by the Dutch Society of Periodontology. A component of this protocol is the Dutch periodontal screening index (DPSI), a procedure that functions as an initial evaluation to determine the level of additional periodontal examination and subsequently, the treatment needs of patients with differing disease levels. This index is also a modification of the CPITN and aims to screen for subjects with minor, moderate and severe periodontal disease. To achieve this, the original CPITN codes 0, 1, 2 remained unchanged, i.e. now written as DPSI 0, 1, 2, respectively. CPITN code 3 was differentiated into 3 minus, that is pathological pockets of 4–5 mm without gingival recession (DPSI 3) and 3 plus that is pathological pockets of 4–5 mm with gingival recession now DPSI 4. CPITN code 4 was recoded into DPSI 5 (Table 1). The ''Dutch perio-protocol'' recognizes three categories of patients: (1) patients that require only oral hygiene instruction and calculus removal (DPSI 1: bleeding pockets $\leqslant$3 mm; DPSI 2: supra- or subgingival calculus), (2) patients that require a limited periodontal examination in order to be able to make a proper treatment plan (DPSI 3) and (3) patients that require an extensive periodontal examination in order to be able to make a proper treatment plan (DPSI 4 and DPSI 5). The ''perio-protocol'' was adopted by the government and since that time it has become mandatory to include assessment of the DPSI during routine dental check-ups and to inform the patient about the results.

The aim of the present paper is (1) to provide evidence that the DPSI is a valuable tool for the screening of the periodontal condition and (2) to investigate to what extent the DPSI is applied by general practitioners in the Netherlands.

Materials and Methods

Validation of the DPSI

For the investigation into the validity of the DPSI, data from the Java project on periodontal disease were used (Van der Velden et al. 2006). In 2002, 131 subjects were clinically examined for plaque, calculus, pocket depth, bleeding on probing and attachment loss at all interproximal sites (for detailed information, see Van der Velden et al. 2006). The clinical examination revealed that various degrees of severity of periodontitis were present and that the prevalence of severe periodontitis defined as subjects showing at $\geqslant$2 sites a pocket depth of $\geqslant$5 mm in conjunction with $\geqslant$6 mm attachment loss (Van der Velden 2005) amounted to 20%. Therefore, this study population seems suitable to study the validity of the DPSI in identifying subjects with moderate to severe periodontitis and to compare it with the CPITN. Using the raw data, the DPSI and CPITN values were determined for each sextant on the basis of the site with the most severe condition (Ainamo et al. 1982). For the CPITN, the score per sextant ranges from 0 to 4 and for the DPSI from 0 to 5.

Table 1. Description of clinical criteria per score of the Dutch periodontal screening index (DPSI), to apply per sextant based on the site with the highest score

Score	Clinical criteria for the score per sextant
0	No pockets >3 mm in depth, no calculus, no overhanging restorations and no bleeding on probing to the bottom of the pocket
1	No pockets >3 mm in depth, no calculus, no overhangs of restorations, but presence of bleeding on probing to the bottom of the pocket
2	No pockets >3 mm in depth, presence of bleeding on probing to the bottom of the pocket, and presence of calculus or overhanging restorations
3	Presence of pathological pockets of 4–5 mm without gingival recession
4	Presence of pathological pockets of 4–5 mm with gingival recession
5	Presence of pathological pockets $\geqslant$6 mm.

Application of the DPSI in general practice

The Department of Quality and Research of the Dutch Dental Association (DDA) provided a computer-generated random sample of 300 practising dentists. In the Netherlands, all dentists working in general practice under the age of 64 amounts to 5499 dentists. Out of them 3373 were participating in the Data Station project of the DDA or in regular dental surveys or refused to participate in surveys. Therefore, the random sample was taken from the remaining 2126 practising dentists. The dentists included were asked in November 2006 to complete a questionnaire giving information about their age, gender, working conditions and the various aspects of their use of DPSI and the ''perio-protocol'' and to return the questionnaire anonymously. Two weeks after the questionnaires were posted, a reminding letter was sent to the selected dentists in order to promote the response. This questionnaire was developed by the DDA for surveys in 1998 and 2002 (van Rossum 2002). To those dentists who were already in practice before the introduction of the DPSI, additional questions were posed about differences before and after the introduction of the ''perio-protocol'' and the DPSI.

Data analysis

Descriptive statistics and data analysis were performed with statistical software from SPSS (version 15.0 for Windows, Chicago, IL, USA). In order to identify the severity of the disease on a subject level, the highest DPSI and CPITN value of a sextant was used. Mean values of the DPSI and the CPITN on a subject level were calculated to test for the equality of dependent correlations between the mean DPSI values and attachment loss as well as the mean CPITN values and attachment loss. For testing this, a structural equation modelling approach was used, as described by Cheung and Chan (2004). In short, a saturated model with perfect fit and zero degrees of freedom is specified. Next, a constraint is imposed on the ψ matrix such that it implies the equality of two correlations. One degree of freedom and a change in χ^2 value is obtained. The latter can be used to determine whether the constraint leads to a significant change in χ^2. When the χ^2 value is significant, the constraint should be

rejected (the correlations are not equal), as it leads to a significant misfit in the model. Whenever $p > 0.05$, the coefficients can be considered equal. In addition, the sensitivity and specificity of the DPSI and the CPITN in detecting subjects with increasing severity of periodontal breakdown were calculated.

Results

Validation of the DPSI

The mean values of the clinical parameters are presented in Table 2. It can be seen that this data set includes a wide range of subjects regarding their periodontal condition. It contains subjects with hardly any bleeding on probing as well as subjects that showed bleeding at all sites. There are subjects with no calculus and those with calculus at $\geqslant$25% of the sites. Furthermore, there are subjects with minor attachment loss and no pockets $\geqslant$5 mm and subjects with severe attachment loss and pockets $\geqslant$5 mm at almost all sites (Table 2). Both the CPITN and the DPSI showed high correlation coefficients with the mean pocket depth and the percentage of sites with deeper pockets (Table 3). However, except for the percentage of sites PD$\geqslant$4 mm, the DPSI showed significant higher correlation coefficients than the CPITN. In Table 4, the correlation coefficients are presented between attachment level parameters and the CPITN and the DPSI. Analysis showed that for both mean attachment loss as well as for the percentage of sites with attachment loss $\geqslant$4, $\geqslant$5 and $\geqslant$6 mm, the DPSI showed significantly higher correlation than the CPITN.

In order to study the value of the DPSI and CPITN in identifying subjects with moderate to severe periodontal breakdown, a comparison was made between subjects with $\geqslant$1 sextants with a DPSI score 4 or 5 and subjects with $\geqslant$1 sextants with a CPITN score 4. For this comparison, subjects were classified into four categories on the basis of $\geqslant$2 sites with attachment loss $\geqslant$3, 4, 5 or 6 mm, respectively, using the full-mouth inter-proximal data set. For the full-mouth inter-proximal measurements, results showed that almost all subjects (98.3%) showed at $\geqslant$2 sites, attachment loss of $\geqslant$3 mm, whereas 19.1% had $\geqslant$6 mm at $\geqslant$2 sites (Table 5). The DPSI score 4 or 5 was found in 61.8% of the subjects and the CPITN score 4 in 50.4%. For subjects with $\geqslant$6 mm attachment loss at $\geqslant$2 sites, this was 19.1% and 16.81%, respectively. On the basis of the sextant with the highest DPSI and CPITN score, the sensitivity and specificity values were calculated for the above mentioned four attachment loss categories (Table 6). It can be seen that for all categories, the sensitivity of the DPSI was higher than that of the CPITN. The DPSI identified 100% of the subjects with at $\geqslant$2 sites attachment loss $\geqslant$6 mm, whereas this was 88% by means of the CPITN. The specificity values of the CPITN were somewhat higher compared with those of the DPSI.

Table 2. Mean values and standard deviations (SD) on a subject level of the clinical periodontal parameters of the study population ($N = 131$) described in Van der Velden et al. (2006) with varying levels of periodontal disease

	Median	Mean ± SD	Range
Number of teeth	27.00	25.90 ± 2.41	16–28
Plaque index	1.00	1.04 ± 0.39	0.21–2.02
Bleeding on probing index	1.25	1.23 ± 0.39	0.27–2.00
Number of sites with subgingival calculus	5.00	5.07 ± 3.19	0–12
Number of sites with gingival recession	1.00	3.34 ± 6.35	0–27
Pocket depth (mm)	3.43	3.53 ± 0.58	1.93–6.16
Attachment loss (mm)	1.80	1.97 ± 1.01	0.22–6.16
Number of sites pocket depth $\geqslant$4 mm	19.00	21.31 ± 12.49	1–55
$\geqslant$5 mm	5.00	7.47 ± 8.15	0–45
$\geqslant$6 mm	1.00	1.95 ± 4.67	0–34
CPITN	3.00	2.99 ± 0.40	2–4
DPSI	3.17	3.21 ± 0.61	2–5

CPITN, community periodontal index of treatment needs; DPSI, Dutch periodontal screening index.

Table 3. Correlation coefficients between the mean DPSI and CPITN values on a subject level and the percentage of sites with a specific pocket depth (PD) on the basis of the clinical data set

	DPSI	CPITN	χ^2	*p*-value
Mean PD	0.83	0.80	7.65	0.006
% sites PD$\geqslant$4 mm	0.75	0.77	0.53	0.47
% sites PD$\geqslant$5 mm	0.86	0.74	15.40	0.0001
% sites PD$\geqslant$6 mm	0.74	0.66	22.20	$<$0.00001

CPITN, community periodontal index of treatment needs; DPSI, Dutch periodontal screening index.

Table 4. Correlation coefficients between the mean DPSI and CPITN values on a subject level and the percentages of sites with specific amount of attachment loss (AL)

	DPSI	CPITN	χ^2	*p*-value
Mean AL	0.66	0.56	50.56	$<$0.00001
% sites AL$\geqslant$4 mm	0.73	0.61	51.16	$<$0.00001
% sites AL$\geqslant$5 mm	0.73	0.61	54.38	$<$0.00001
% sites AL$\geqslant$6 mm	0.70	0.60	34.74	$<$0.00001

CPITN, community periodontal index of treatment needs; DPSI, Dutch periodontal screening index.

Application of the DPSI in general practice

A total 141 out of the 300 questionnaires were returned to the Department of Periodontology (response rate 47%). Out of these, six were returned uncompleted and 16 were completed by dentists who were no longer working as general dental practitioners (GDP). Thus, the sample consisted of 119 GDPs with a mean age of 45.7 years ranging from 24 to 62 years; 93 (78%) were males and 26 (22%) females. Ninety-eight (82%) of the respondents were already working as GDP before 1998 and 21 (18%) started their practice thereafter. On average, 2.6 GDPs were working per dental office; however, in the majority of practices, 1 GDP was working alone. As a mean, 1.75 dental hygienists and 2.0 assistants were working per dental office.

The results showed that about 75% of the GDPs were applying the DPSI, although only 15.1% were performing this consistently when a regular check-up was performed (Table 7). The mean time required for the DPSI assessment amounted to 3.1 min. (SD = 2.7) and

Table 5. Percentage of subjects having ⩾2 sites with attachment loss (AL) of 3 mm or more identified by full-mouth approximal scoring or by one or more sextants with a DPSI score 4/5 or by one or more sextants with a CPITN score 4 ($N = 131$)

		Subjects with ⩾1 sextant	
	full-mouth score $N = 131$	DPSI 4/5 $N = 81$	CPITN 4 $N = 66$
Subjects with ⩾2 sites			
AL⩾3 mm	98.3%	58.0%	46.6%
AL⩾4 mm	63.3%	49.6%	39.7%
AL⩾5 mm	37.4%	35.8%	27.5%
AL⩾6 mm	19.1%	19.1%	16.8%

CPITN, community periodontal index of treatment needs; DPSI, Dutch periodontal screening index.

Table 6. Sensitivity and specificity of the DPSI and the CPITN on the basis of the sextant with the highest score, to identify subjects with ⩾2 sites with attachment loss (AL) ⩾3 mm or more

	Subjects with ⩾1 sextant			
	DPSI 4/5		CPITN 4	
	sensitivity	specificity	sensitivity	specificity
Subjects with ⩾2 sites				
AL⩾3 mm	64.9%	64.3%	52.1%	64.3%
AL⩾4 mm	78.3%	66.7%	62.7%	70.8%
AL⩾5 mm	95.9%	58.5%	73.5%	63.3%
AL⩾6 mm	100.0%	47.2%	88.0%	58.5%

CPITN, community periodontal index of treatment needs; DPSI, Dutch periodontal screening index.

Table 7. Frequency of the application of the DPSI during regular dental check-ups by general practitioners, percentage assessments and required time ($N = 119$)

	Application of the DPSI			
	consistently	usually	sometimes	never
	18	36	35	30
	15.1%	30.3%	29.4%	25.2%
% DPSI assessments during regular check-up	100	64.6 (22.6)	23.2 (15.0)	–
Time needed for DPSI assessment (min.)	2.8 (2.8)	3.2 (3.1)	3.2 (2.2)	–

DPSI, Dutch periodontal screening index.

Table 8. Judgement of general practioners (%) about the procedure to screen patients by means of the DPSI for their periodontal health ($N = 119$)

Do you think this procedure to be:	Yes	No	No opinion
''Easy''	57.8	16.3	10.4
''Meaningful''	63.0	11.9	11.1
''Labour intensive''	24.4	45.9	13.3
''Time-consuming''	25.2	43.7	14.8
''Adequate reimbursement''	9.6	46.7	25.9
''Administrative aggravating''	37.0	37.8	9.6

DPSI, Dutch periodontal screening index.

ranged between 1–15 min. In general, the GDPs found the application of the DPSI easy and meaningful but the financial reimbursement inadequate (Table 8). The most frequent reasons mentioned for not assessing the DPSI during regular dental check-ups included insufficient motivation of the patients, not considered necessary in patients with good oral health and in patients who had already been screened and referred to a specialist (Table 9). GDPs reporting of never applying the DPSI (22.2%) mentioned a number of arguments; in this respect, it was most frequently mentioned that it takes too much time (Table 9).

The majority of the responding GDPs were already working in practice before the introduction of the ''perio-protocol'' and the DPSI in 1998 ($N = 94$), of which only 6.4% responded to be unsatisfied about the introduction of these measures. In contrast, over 60% reported to be very satisfied or satisfied about this introduction (Table 10). Regarding the attention of GDPs for the periodontium, results showed that over 35% of the GDPs now pay more attention to the periodontal condition due to the introduction of the ''perio-protocol'' and the DPSI (Table 11). In addition, they also feel that the dental profession has become more aware of periodontal problems, that the distinction between perio- and non-periopatients has become clearer and that prevention receives more attention in dental care (Table 12).

Discussion

In the 1980s, it became apparent that not everybody is equally susceptible to periodontal diseases and that periodontitis concentrates in a relatively small part of the population (Löe et al. 1986). Therefore, it was suggested that populations should be screened to identify the susceptible individuals. As a result, the BPE was introduced in the United Kingdom and the PSR in the United States. However, both systems have a problem that the screening procedure itself becomes more complicated. In case of the BPE, furcation analyses must be carried out and attachment loss ⩾7 mm should be assessed, whereas the use of the PSR includes the assessment of furcation involvement, mobility, mucogingival problems and recession ⩾3.5 mm. It can be argued that the 7 mm attachment loss, according to the BPE, and the recession ⩾3.5 mm on top of, e.g., a 4 mm pocket in case of the PSR identifies individuals in such an advanced stage of disease that treatment becomes complicated with a more doubtful prognosis for the teeth.

A screening procedure to become successfully implemented in daily practice should be easy to apply, identify periodontitis patients in a phase when treatment still has a good prognosis and should take a minimum amount of time. The sensitivity of such a procedure should be high in order not to miss

Table 9. Reasons (%) for not (always) using the DPSI during regular dental check-ups by general practitioners

Reasons for *not always* using the DPSI* ($N = 71$)		Reasons for *never* using the DPSI* ($N = 30$)	
Patients are not motivated	60	It takes too much (extra) time	40
No need in patients with good oral health	50	Patients are not motivated	23
Patients are already screened and referred	37	This procedure is too rigid	23
It takes too much (extra) time	19	I use a better procedure	20
The honorarium is too low	13	The honorarium is too low	20
Sometimes forgotten	6	The treatment options are too much guided	20
Only in case of deep pockets	3	It is unmanageable	17
Other reasons	13	Other reasons	16

*Several answers were possible.
DPSI, Dutch periodontal screening index.

Table 10. Degree of satisfaction among general practitioners (%) about the fact the by 1 January 1998 the ''perio-protocol'' and the DPSI was introduced ($N = 94$)

	Degree of satisfaction	
	perio-protocol	DPSI
Very satisfied	13.8	10.6
Satisfied	46.8	42.6
Not satisfied nor unsatisfied	31.9	36.2
Unsatisfied	4.3	6.4
Very unsatisfied	2.1	2.1
Don't know	1.1	2.1

DPSI, Dutch periodontal screening index.

Table 11. Change in attention of general practitioners (%) to the periodontium due to the introduction of the ''perio-protocol'' and the DPSI ($N = 94$)

Does the periodontium of your patients get more attention?	Change of attention to periodontium due to	
	perio-protocol	DPSI
Much more	5.3	7.5
More	29.8	28.7
No more no less	63.8	62.8
Less	1.1	1.1
Much less	0	0
Don't know	0	0

DPSI, Dutch periodontal screening index.

Table 12. Opinion of general practitioners (%) on a number of statements ($N = 94$)

Since the introduction of the ''Perio-protocol'' and the DPSI:	Opinion		
	agree	agree/nor disagree	disagree
''Is the dental profession more aware in dealing with periodontal problems''	55.3	36.2	8.5
''Has the distinction between patients with and without periodontitis become more clear''	46.8	37.2	16.0
''Gets prevention more attention in dental care''	46.8	37.2	16.0

DPSI, Dutch periodontal screening index.

periodontitis patients in need of treatment. The results of the present study shows that the DPSI correlated better with the real degree of attachment loss than the CPITN and identified all subjects with severe disease, i.e. $\geqslant 2$ sites with 6 mm or more attachment loss. The results also show that the specificity of the CPITN was somewhat higher than that of the DPSI. In terms of screening, specificity may be less important than the sensitivity. Specificity values of 47.2% (DPSI) and 58.5% (CPITN) of the present study, in case of severe disease, would imply that a number of subjects receive a false-positive diagnosis of severe disease ($\geqslant 2$ sites with 6 mm). However, these subjects will then receive an extended examination resulting in the proper diagnosis. This is a small disadvantage compared with the much worse scenario of not identifying patients with severe periodontitis due to an inadequate screening procedure. In the present study, three subjects with severe disease would have been missed by using the CPITN, whereas all subjects with severe disease were identified using the DPSI. On the other hand, it must be realized that the relatively low specificity values of the DPSI and CPITN indicate that these evaluation systems cannot be used for epidemiological studies as the severity of disease may be overestimated.

The present study used the data set obtained from a longitudinal study on the national history of periodontal disease in Indonesia (Van der Velden et al. 2006). As it was a field study with limited dental facilities and periodontitis develops primarily interdentally, it was decided to examine only the buccal aspect of all interdental areas. Therefore, the present study may have some limitations because mid-buccal, mid-lingual and inter-proximal lingual measurements were not included. On the other hand, the screening procedure with the DPSI as well as the CPITN, include evaluation of all sites per sextant until the highest score is obtained. Therefore, it seems unlikely that very different results would have been obtained if the present data set included evaluation of six sites per tooth. Another aspect may be that in the present study for the comparison of the DPSI and CPITN a force-controlled probe was used with a tapered probe tip, a cross section at the tip of 0.5 mm and Williams mm markings. For the assessment of the CPITN, a special probe has been developed with a ball-ended probe tip of 0.3 mm cross section and with a shaded area between 3.5 and 5.5 mm: the WHO probe (WHO 1978). Previous research showed that with the same amount of probing force (0.10–0.25 N), the tip of

the WHO probe tends to be located apical from the attachment level, whereas the tapered probe fails to reach the attachment level (Bulthuis et al. 1998). However, for the differentiation between pockets with or without gingival recession when assessed by means of the WHO probe, comparable results would have been probably obtained as with the present force-controlled probe.

Few studies evaluated the application of the PSR and the BPE. The American dentists' attitude towards the PSR system was surveyed by Lo Frisco & Bramson (1993). They reported that 77% of the GDPs rated the PSR system good to excellent. In the present study, 60% GDPs rated the introduction of the perio-protocol and DPSI as satisfactory to very satisfactory and 8% as unsatisfactory to very unsatisfactory. The high appreciation of the American dentists of the PRS system as reported in the survey of Lo Frisco & Bramson (1993) could be due to a very successful campaign supported by the industry. No recent data appear to be available concerning the extent of application of the PSR in daily practice in the United States today. A recent study evaluated the use of the BPE in the United Kingdom (Tugnait et al. 2004). This study reported that 91% of GDPs was applying the BPE in new patients with 56% using it for all patients. This indicates that 9% of the GDPs were not applying the PBE, which is a substantially lower figure than the 25% of GDPs in the present survey that reported to never use the DPSI.

The result that one-quarter of GDPs in the Netherlands is not performing the periodontal screening is worrying, also in the light of the low response rate of 47%. This low response rate may be due to the feeling of the GDPs that the questionnaire was not at all anonymous and that, by a hidden trick, they could have been traced. This would be frightful to them as the application of the DPSI during routine dental check-ups is mandatory since 1998. Hence, the most negative scenario would be that almost three-quarters of the GDP are not performing the mandatory screening i.e. the 25% that admitted to never do the screening and the 47% non-responders. However, 3373 GDPs were not included in the population from which the random sample was taken because they were either participating in the Data Station project of the DDA or in regular dental surveys or refuse to participate in surveys. This latter group accounted to about one-third. Therefore, the supposition that 75% of the GDPs are not performing the mandatory screening may be too negative, as the GDPs participating in the Data Station project of the DDA and participating in regular surveys were not included in the sample, and they may have a more positive attitude toward dentistry in general and periodontal screening in particular. Nevertheless, there may be lessons to learn when mandatory screening periodontal screening procedures are introduced in a country. In the first place, the promotion campaign was primarily carried out by the Dutch Society of Periodontology and this may have been insufficient and not supported enough by the government. In this respect, support of such a campaign by the industry may be of great help. Secondly, there was no financial incentive to perform the periodontal screening. It was mandatory to do it within the already existing routine screening procedure for caries. So, it may be advisable to introduce a specific fee for periodontal screening in order to have a higher success rate among GDPs regarding the implementation of periodontal screening in there daily practice.

In conclusion, the results of the present study show that the DPSI is a valuable tool for yearly screening for periodontitis. The results of the screening procedure determine the level of subsequent more extensive periodontal examination from which the treatment needs of patients can properly be planned. In addition, it requires little time and can, therefore, easily be applied during routine general dental check-ups. However, for the implementation of the screening by means of the DPSI into the dental community, it may be advisable to introduce a specific fee.

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Clinical Relevance

Scientific rationale for the study: During regular general dental check-ups, examination for periodontitis is required in all patients. However, a full periodontal examination is time consuming and therefore, a screening procedure that takes less time may be indicated. A screening procedure should be easy to apply, identify periodontitis patients in a phase when treatment still has a good prognosis and should take a minimum amount of time.

Principal findings: Here, the value and use of the Dutch Periodontal Screening Index (DPSI) a modification of the Community Index of Treatment Needs (CPITN) is described. With the DPSI, 4–5 mm pockets with gingival recession is introduced as a separate category. The combination of screening for 6 mm pockets and 4–5 mm pockets with recession (DPSI scores 4 and 5), resulted in the identification of all subjects in the study population with $\geqslant$6 mm attachment loss at $\geqslant$2 sites. Although the required mean time for the application of the DPSI is 3 min., 25% of the Dutch dentists do not perform this mandatory screening procedure.

Practical implications: The DPSI is a valuable tool for the screening of the periodontal condition of dental patients during routine general dental check-ups. However, as not all dentists perform such a procedure, more efforts should be used to include a routine periodontal examination in general practice.