

## PREVENTION OF UNHEALTHY BEHAVIOUR BY YOUTH HEALTH CARE IN THE NETHERLANDS

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### Abstract

*Background.* In this study the effect is assessed of (repeated) well-care visits and freely accessible consultation hours at secondary schools on the prevalence of adolescent health compromising behaviour and later obesity.

*Methods.* An ecologic case-referent study design was used with data from the Netherlands Bureau of Statistics, the Ministry of Defence, the 1992 High-School Student Study, all youth health care departments in The Netherlands and relevant census.

Data from the High-School Student Study included 4,569 students aged 12-18 years of which 4,167 had answered all questions on health compromising behaviour, and eating habits. The data from the Ministry of Defence included 1,004 cases with a Body Mass Index greater than 27 of a total of 12,251 male conscripts. The census of 18- and 19-year-old males in the regions of the relevant youth health care departments served as referents.

*Results.* Except for the use of alcohol the effect of more well-care visits was in all cases negative, and for the use of tobacco even significantly so (OR=1.15, 95% CI=1.01-1.33). The availability of open consultation hours had an adverse effect on use of alcohol (OR=1.29, 95% CI=1.11-1.50).

The Odds Ratio for obesity in male conscripts showed an adverse effect of a greater number of well-care visits (OR=2.46, 95% CI=1.74-3.46) and the availability of open consultation hours (OR=1.97, 95% CI=1.72-2.25).

*Conclusions.* This study does not support the hypothesis that on a population level, preventive activities of youth health care departments such as (more) frequent well-care visits or offering open consultation hours at secondary schools, have a beneficial effect on prevention of health compromising behaviour or obesity.

**Keywords:** prevention, health compromising behaviour, obesity, youth health care

## Introduction

In the face of increasing substance abuse, physical inactivity with concomitant obesity and other forms of risky behaviour among adolescents,<sup>1-6</sup> the initial confidence about the ability to influence adolescent lifestyle and thereby later health has gradually become more realistic. Until recently, prevention programmes primarily aimed at increasing knowledge, rather than influencing behaviour. However, many studies have shown that the link between knowledge, attitudes, and behaviour is tenuous, and that increased knowledge does not necessarily lead to a change in behaviour. Empirical evidence moreover, has consistently shown the ineffectiveness of programmes focussing on increasing knowledge, and some were even associated with increased drug use by stimulating students' curiosity.<sup>8,9</sup> Many drug-use prevention programmes have relied almost exclusively on ads or public service announcements to impact attitudes and behaviour. Evaluative research is frequently non-existent, strategy is not well formulated and audience segmentation is forgone.<sup>10</sup> Even high-profile and costly programmes, such as DARE (Drug Abuse Resistance Education) in the USA showed only limited effect on preventing drug abuse, if at all, but are nevertheless continued because they are highly valued by society.<sup>9,12,13</sup> Moreover, messages about healthy lifestyles are confusing and often conflicting,<sup>2,14</sup> leading to behaviour often contrary to what was intended by the health promotion professionals.<sup>8,14,15</sup>

The many aspects of risk behaviour are highly interrelated,<sup>16-18</sup> and have numerous risk factors in common.<sup>19-23</sup> Therefore, programmes using multimodal approaches and focussing on for instance the least advantaged segments of the community seem to be more successful.<sup>10,21,24-26</sup> As evidence suggests that risky behaviour starts early and tends to persist well into adulthood, preventive measures and programmes should be implemented at a far earlier age than is now customary.<sup>2,8,19,22,23,27-32</sup> This is especially true for prevention of obesity, as treatment in adults has been shown to be largely ineffective,<sup>33,34</sup> and dietary treatment of children and adolescents is complicated by possible interference with growth.<sup>4</sup>

It is widely recognised that, although health education at schools is important as a basis for informed decision making about (future) health behaviour, only population-wide efforts with commitment from teachers, parents, peers and the community as a whole can potentially contribute to the prevention of substance abuse and other forms of health compromising behaviour.<sup>1,3,8,9,13,25,35-38</sup> Even though social influence and life skills training programmes show limited usefulness in preventing substance abuse,<sup>9,11,39</sup> there is increasing evidence that social factors are more important than personal attitude, and that within-group processes (such as peer influence) are considerably more important than personal factors (such as self-esteem).<sup>19,22,40,41</sup> But even when programmes take into account as much of these factors as possible, long-term results are hardly favourable.<sup>42-44</sup>

Although there are some minor differences, developments in The Netherlands are virtually the same as those in other western countries, both in regard to the increase in substance abuse as to the (discussion with respect to the) development, implementation and effectiveness of prevention programmes.

### *Prevention of unhealthy behaviour and obesity by youth health care in The Netherlands*

Youth health care (YHC) departments in The Netherlands are part of the Regional Health Services, often working for more than one municipality. They offer programmes to all primary and secondary schools in the region and the take-up by the schools is almost 100%. Since the first school-based YHC activities were initiated

in The Netherlands – more than a century ago - the YHC has grown into a nation-wide, labour-intensive service, employing hundreds of physicians, nurses and medical assistants. By the time they leave school, every child in The Netherlands will have been exposed to a wide variety of preventive health - and health promotion activities, administered by many different YHC workers. The services are most often rendered on the school premises and may include health promotion programmes, screening for specific physical abnormalities, well-care visits and (freely accessible) consultation hours. For the most part these activities are carried out by youth health care physicians, less often by nurses, and medical assistants. Between youth health care departments, there is a large variety in the total number, content and intensity of programmes, screening, and well-care visits as well as the availability of consultation hours at schools. This variety is largely due to different views and priorities in the various health care regions with regard to the content of preventive services for children and adolescents, and in no way related to differences in prevalence of adverse behaviours between the youth health care departments.

Well-care visits are orientated towards primary or secondary prevention of physical, behavioural and psychological problems, and are offered to all children and adolescents at a certain age or in specific grades. Especially at primary schools, parents are encouraged to accompany their children. At primary schools, the take-up by pupils is generally more than 90%, at schools for secondary education somewhat lower, depending on the level of education. The visits last 15 – 20 minutes a student.

During the visits, among others, height and weight are measured, and the height/weight ratio determined in relation to age and gender.<sup>45</sup> Dependent on age, questions are asked about health related behaviour: smoking, use of alcohol and cannabis, and eating habits. Especially in the case of an abnormal height/weight ratio – almost always obesity – eating habits are discussed with student and/or parent.

Consultation hours are accessible to pupils, parents and teachers, normally without prior appointment. In many cases, open consultation hours were implemented, because in the early eighties regular well-care visits for the older adolescents (age 16/17 years) were discontinued, often on budgetary grounds. They are intended to give easy access to the Health Care professionals – in most cases physicians, sometimes nurses – for questions on physical and mental health problems and their prevention.

What sets youth health care practice apart from primary and secondary health care, is the fact, that youth health care workers, be it physicians or nurses, are not permitted to treat children under their care. If therapy of any sort is deemed necessary, the child must be referred to a general practitioner or other relevant therapist. This practice seems to be unique when compared to school health services in most other countries.

In the past years, not only the frequency of contacts has changed, but also the content. Especially the last two decades have seen profound changes in the way school-based youth health care services are conducted, in many instances necessitated by budgetary cutbacks. Examples, however, of changes brought about on scientific grounds, or due to outcomes of evaluative health services research, are rare. This is especially true for the total number of well-care visits, the content of these visits, the institution of freely accessible consultation hours at schools for secondary education, health promotion activities and the like.

Part of the rationale for implementing school-based activities is, that by frequent individual contacts, be it during screening, well-care visits or consultation hours, (the onset of) unhealthy behaviour, such as smoking and (excessive) alcohol use will be detected at a time when children are still amenable to health promotion messages and behaviour can be influenced. Since most problems leading to the development of health compromising lifestyles start early and tend to persist well into adulthood, more individual contacts should

increase the likelihood of early detection and thus early prevention. However, the effectiveness of this approach is not substantiated by any evaluative research.

In other countries, such as USA, UK and Australia, similar questions are raised regarding the effectiveness of school health services, the value of (repeated) well-care visits, and in general the contribution of these activities to general health and healthy behaviour of children and adolescents. Also, the lack of scientific underpinnings for these activities and the urgent need for evaluative studies are emphasised and alternatives are discussed.<sup>11,44,46-49</sup>

The purpose of this study is to determine whether a greater number of well-care visits, and/or the availability of freely accessible ('open') consultation hours at schools for secondary education result in an improved lifestyle of the secondary school population and a reduced prevalence of obesity in male conscripts.

## **Population and setting**

### *The High-School Students Study*

In 1992 The Netherlands Institute for Budget Information repeated the High-School Students Study for a random sample of all schools for secondary education in The Netherlands. More than 11,000 students were asked to complete a questionnaire, which included questions concerning lifestyle: smoking habits, use of alcohol and cannabis (ever use of tobacco, alcohol or cannabis in the last 12 months) and eating habits. The questionnaires were completed in the classroom in 1992, at the beginning of the new school year, and had a response of more than 95%. A random selection of 50% was made available for this analysis.

The total number of well-care visits of youth health care physicians or nurses, the grades and type of schools in which they were planned – at both primary and secondary education schools – and the availability of open consultation hours at schools for secondary education in the period of 1987-1992 were determined on the basis of annual reports of all the Dutch youth health care departments, supplemented with information gained by postal questionnaire and if necessary direct personal contact. Only one of the then 63 youth health care departments refused to participate. For each student in a certain grade at the time of the survey, the number of well-care visits he or she had been exposed to, the number of years since the last visit, and the availability of open consultation hours was assessed. Table 1 gives an overview of the distribution of the study population according to number of well-care visits, and availability of open consultation hours.

### *Ministry of Defence conscript data*

From the Ministry of Defence height, weight, postal code of place of residence and year of birth were obtained of all (male) conscripts that underwent a physical examination in 1995. Only those that were born in the year 1976 or 1977 (age 19 or 18) were selected (n=12,251).

As a measure of obesity, the Body Mass Index was used ( $BMI: \text{weight}(\text{kg})/\text{height}(\text{m})^2$ ).<sup>30,50,51</sup> Cases were 1,004 conscripts with a BMI of more than 27.

Based on the age of the conscript and the relevant information about the youth health care departments, the total number of well-care visits and the availability of open consultation hours were determined for each conscript. As all conscripts that had no well-care visits came from the same youth health care department, this group was not included in the analysis.

The census of 18- and 19-year-old males in the regions of the youth health care departments served as referents. The relevant information was obtained from the Netherlands Bureau of Statistics.

## **Methods**

### *The High-School Students Study*

Students were allocated to youth health care departments according to the postal code of the school they visited.

Based on the literature, the following co-variables were selected from the questionnaire for inclusion in the regression models as independent variables: ethnic origin, type of education, family situation, parental occupational status and degree of urbanisation of the place of residence of the subject.

For each question on health behaviour (ever use of tobacco, alcohol, cannabis in the last 12 months, and self-reported eating habits) a dichotomous variable was constructed. With the resulting four dichotomous variables as dependents, in logistic regression procedures the effect of having access to open consultation hours (procedure 1) and of the total number of well-care visits and the time elapsed since the last of these visits (procedure 2) conditional on the co-variables was estimated. The following interaction terms were also included: parental occupational status and ethnicity, type of school and ethnicity, and type of school and grade. Variables were added and retained in the model only when inclusion resulted in a substantial change (> 5%) in the Odds Ratio of the determinant under consideration. When an interaction term was included, in the final model the constituent variables were also included.

### *Ministry of Defence conscript data*

Based on the postal code of the place of residence, it was determined to what youth health care department the conscripts had to be allocated.

As the (six) variables described in a report of the Dutch Institute for Research on Government Spending on regional differences in prevalence of psychosocial problems among 0-18-year-olds,<sup>52</sup> are strongly associated with the prevalence of obesity as well, these six co-variables (ethnic origin, number and type of facilities for secondary education, family situation, parental occupational status and degree of urbanisation of the place of residence of the subject) were chosen to balance the youth health care departments with respect to possible differences in the prevalence of obesity. This was done by weighting the data with overall-weights for each region, composed of the weights for each variable for each region. The totals of the census were similarly weighted.

Table 2 gives an overview of the distribution of the number of conscripts per number of visits and the availability of open consultation hours before and after adjusting for differences in the six variables mentioned before. Finally, the adjusted Odds Ratios for obesity in case of having access to open consultation hours and more frequent well-care visits were calculated.

## **Results**

For the High-School Student data, in two logistic regression procedures for each type of behaviour, the effect of having access to open consultation hours and of the total number of well-care visits plus the number of years since the last of these visits on the prevalence of this behaviour was estimated. Table 3 shows the Odds Ratios

with their 95% confidence intervals of the four lifestyle variables under consideration. In all cases an Odds Ratio greater than 1.00 signifies an adverse effect.

Except for the use of alcohol the effect of a greater number of well-care visits was in all cases opposite to the intended direction, and for the use of tobacco even significantly so (Odds Ratio=1.15, 95% CI=1.01-1.33). The influence of the number of years elapsed since the last visit was varied and in all cases not significant.

The availability of open consultation hours had a significantly adverse effect on use of alcohol (Odds Ratio=1.29, 95% CI=1.11-1.50). Eating habits on the other hand were favourably affected, although not significantly so (Odds Ratio=0.91, 95% CI=0.80-1.04).

For the conscript data, the adjusted Odds Ratios for obesity in case of having access to open consultation hours and more frequent well-care visits were calculated. Table 4 shows the adjusted Odds Ratios for obesity for male conscripts per number of visit and availability of open consultation hours. Both a greater number of visits (3 visits as compared to one) and the availability of open consultation hours had a significantly adverse effect on the prevalence of obesity.

## Discussion

This study does not support the hypothesis that at a population level preventive activities of youth health care departments such as (more) frequent well-care visits or institution of open consultation hours at secondary schools, have a beneficial effect on health compromising behaviour. Before accepting these findings however, several methodological issues need to be addressed.

With respect to misclassification, given the comprehensive method of data gathering, the information concerning the working methods of the youth health care departments is of high quality. This is not the case where the content of well-care visits is concerned, especially in regard to health promotion activities and relevant advice. Studies suggest however, that inter-physician variations are far greater than possible differences between the departments.<sup>53</sup>

Internal migration has probably led to some misclassification on the determinants, as it was not possible to ascertain which students or conscripts had moved to other youth health care regions and therefore could have been subject to other youth health care working methods. Therefore, some dilution of the effect due to this misclassification might have occurred. Information from the Netherlands Bureau of Statistics indicate, however, that in 6 years no more than 3% of the relevant age group will have moved to another youth health care region. Generally, attendance at well-care visits is more than 85% and often reaches 95% at schools for higher general secondary or pre-university education. Failing to appear due to illness will generally lead to a call up later that year or the following year, so the total number of visits will eventually be the same. Nevertheless, students from a lower social-economic background and of those more often the girls, fail to appear relatively more often. The same can be said when non-attendance is caused by truancy, although in that case it more often concerns boys.

Until 1996, all Dutch men becoming of military age (18 years old) were routinely drafted. The cohort of 1995 conscripts therefore represents the birth-cohort of men that were eighteen in 1995 or shortly before. Of those a small proportion is actually enlisted and thus has a physical examination. Reasons for exclusion or deferment are physical and mental handicaps, continuation of education, and the like. As such the conscript data are selective and not a representative sample of Dutch men at that age. Because there are no regional differences in reasons for exclusion or deferment, however, the selection criteria are the same throughout the country and the data will be comparable between the youth health care departments. To further minimise the effect of a

possible uneven distribution of relevant variables between the different categories, both the conscript data and the referent population were weighted for differences in degree of urbanisation, proportion of ethnic minorities, percentage of single-parent families, number and type of facilities for secondary education and percentage of people on social security.

The lack of information about youth health care practice in the years between 1992 and 1995 will have little influence on the outcome of the analysis, if at all. Only one youth health care department (with 9 cases) had a well-care visit planned after grade 2 of secondary school, so all other conscripts would have had the total possible number of well-care visits in 1992. As for consultation hours, in the period under consideration no youth health care departments discontinued these once they were instituted. Moreover, the institution of consultation hours will not be effective immediately after implementation and generally will take more than a year to become an accepted extension of youth health care practice. Therefore, influence of the institution of consultation hours in 1993 or later can be expected only after 1994.

It is not easy to find an explanation for the unexpected adverse effects, although an absence of positive effects is in line with literature regarding effectiveness of preventive programmes. At the very least it can be concluded that the claim by youth health care workers of a beneficial effect of repeated well-care visits and open consultation hours is not substantiated by these data. It can be hypothesised that in the case of the well-care visits, with their attention to unhealthy habits and accompanying health promotion messages, adolescents in a juvenile reaction against this well-meant advice and attention might exhibit precisely the behaviour they are warned against. Conversely, this could explain, why open consultation hours have a beneficial effect on eating habits. In the case of worry about overweight, adolescents actively seeking advice will be more prone to take it, translating into improved eating habits.

## **Conclusion**

It is concluded that at the population level, a contribution of the Dutch youth health care departments to improving healthy behaviour and prevention of obesity among adolescents by offering one or more visits to youth health care workers or maintaining open consultation hours, cannot be demonstrated. This is surprising as the expectation with respect to the effectiveness of these programmes is high, and prevention of unhealthy behaviour is considered to be one of the main targets for youth health care activities in this age group. In view of the international literature, however, these high expectations seem less realistic.

Further studies are urgently needed to inquire into the reasons behind this lack of demonstrable effects. Also, it should be determined whether perhaps specific groups within the population can benefit from these youth health care activities, rather than the population as a whole. In the mean time, other methods for prevention of unhealthy behaviour and substance abuse, within or outside the context of youth health care, should be developed. Leaving the activities unchanged would represent an unreasonable and disproportionate burden to the already limited resources of Preventive Health Care. In addition, this study stresses the importance of proper evaluation of any programme directed to prevent unhealthy behaviour and substance abuse.

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**Table 1.** Total number of students per number of well-care visits and availability of open consultation hours (High-School Students Study).

	<b>consultation hours</b>	<b>no consultation hours</b>	<b>undetermined</b>	<b>TOTAL</b>
no visits	235	45	-	280
1 visit	696	990	170	1,856
2 visits	1,124	765	415	2,304
3 visits	31	98	-	129
<b>TOTAL</b>	<b>2,086</b>	<b>1,898</b>	<b>585</b>	<b>4,569</b>

**Table 2.** Total unweighted and weighted<sup>a</sup> number of conscripts per number of well-care visits and availability of open consultation hours (Ministry of Defence conscript data).

	<b>consultation hours</b>		<b>no cons. hours</b>		<b>undetermined</b>		<b>TOTAL</b>	
	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted
no visits	0	0	112	53	0	0	112	53
1 visit	967	561	761	599	0	0	1,728	1,160
2 visits	5,061	4,983	3,423	3,479	358	305	8,842	8,767
3 visits	245	229	254	243	0	0	499	472
unknown	226	463	0	0	844	1,320	1,070	1,783
<b>TOTAL</b>	<b>6,499</b>	<b>6,236</b>	<b>4,550</b>	<b>4,375</b>	<b>1,202</b>	<b>1,625</b>	<b>12,251</b>	<b>12,236</b>

<sup>a</sup> weighted for differences in degree of urbanisation, proportion of ethnic minorities, percentage of single-parent families, number and type of facilities for secondary education and percentage of people on social security

**Table 3.** High-School Students Study: Odds Ratios and their 95% confidence intervals for the influence of having access to open consultation hours, the total number of well-care visits and the number of years since the last well-care visit (reference categories 'no visits' and '1 year') on the four lifestyle variables before and after introduction of confounding variables (O.R. > 1.00 signifies an adverse effect).

		alcohol	tobacco	softdrugs	eating habits
open consultation hours	crude OR	1.22 (1.06-1.41)	0.94 (0.82-1.07)	0.83 (0.60-1.16)	0.86 (0.76-0.97)
	adj. OR			0.96 (0.67-1.36) <sup>b</sup>	
	adj. OR	1.29 (1.11-1.50) <sup>a</sup>		1.20 (0.83-1.74) <sup>c</sup>	0.91 (0.80-1.04) <sup>a</sup>
number of well-care visits	crude OR	1.14 (0.89-1.33)	1.20 (1.04-1.38)	1.34 (0.94-1.91)	
	adj. OR	0.99 (0.84-1.17) <sup>d</sup>	1.15 (1.01-1.33) <sup>e</sup>	1.30 (0.91-1.85) <sup>e</sup>	1.08 (0.95-1.24)
number of years elapsed	crude OR	1.19 (1.11-1.29)	1.08 (1.01-1.16)	1.27 (1.07-1.51)	
	adj. OR	0.91 (0.83-1.00) <sup>d</sup>	0.98 (0.91-1.06) <sup>e</sup>	1.11 (0.92-1.33) <sup>e</sup>	1.01 (0.94-1.08)

<sup>a</sup> after introduction of variable 'type of education'

<sup>b</sup> after introduction of variable 'urbanisation'

<sup>c</sup> after introduction of variable 'age', and 'type of education'

<sup>d</sup> after introduction of variable 'grade'

<sup>e</sup> after introduction of variable 'age'

**Table 4.** Ministry of Defence conscript data: adjusted<sup>a</sup> Odds Ratios (95% confidence intervals) for obesity (BMI > 27) per number of visits and availability of open consultation hours (O.R. > 1.00 signifies an adverse effect).

	cases (BMI > 27)	referents (census)	OR (95% CI)
1 visit	95	8,664	
2 visits	733	66,672	1.00 (0.80-1.23)
3 visits	52	1,927	2.46 (1.74-3.46)
no consultation hours	373	47,441	
consultation hours	528	34,044	1.97 (1.72-2.25)

<sup>a</sup> The data are weighted for differences in degree of urbanisation, proportion of ethnic minorities, percentage of single-parent families, number and type of facilities for secondary education and percentage of people on social security