

## Invited article

## A survey among potential employers for developing a curriculum in public health nutrition

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**Abstract**

*Objectives:* To describe which functions potential employers of public health nutritionists in Norway find important for a person trained in public health nutrition to be able to carry out. Further, to illustrate how the findings were used in the development of a curriculum for a bachelor in public health nutrition at Akershus University College.

*Design:* A non-random, cross-sectional survey using a questionnaire with both pre-coded and open-ended questions.

*Subjects:* Ninety-one establishments working in various fields more or less related to nutrition responded (response rate of 45%).

*Results:* Local offices of the Norwegian Food Safety Authority were over-represented among respondents. Functions related to communication and food and nutrition laws and regulations were most frequently rated as important by the respondents. Functions in nutrition research, project work and policy and planning were also regarded important by more than half of the respondents. The priorities of the potential employers together with the additional comments and suggestions were taken into account when a new curriculum on public health nutrition was developed.

*Conclusions:* The assessment of functions prioritised by employers of public health nutritionists gave a valuable input for developing a new curriculum in public health nutrition. It reflected the challenges of the real world that public health nutritionists will work in and therefore helped making the curriculum potentially more relevant.

**Keywords**  
Curriculum development  
Functions  
Public health nutrition

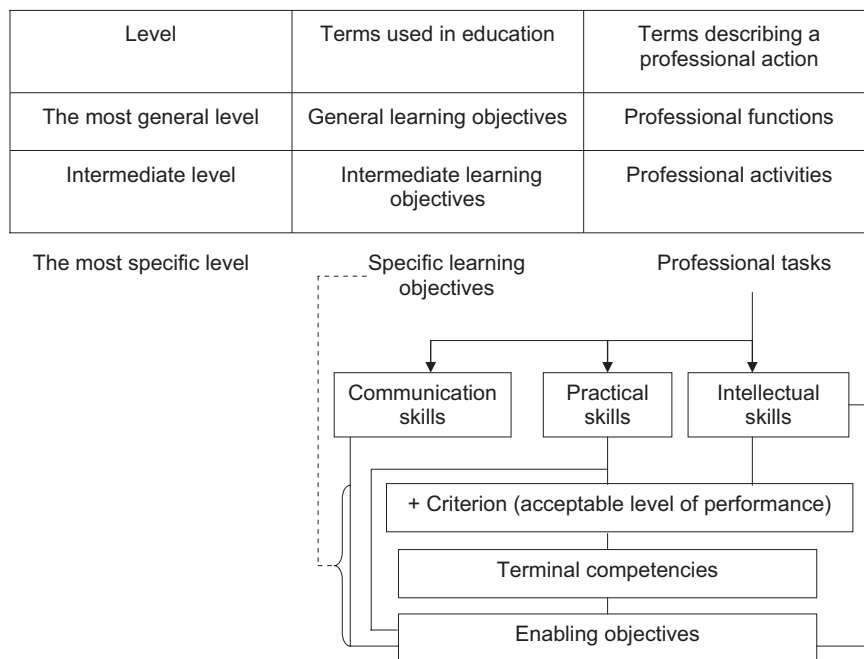
Nutrition training and development of a competent nutrition work force is essential to meet the many challenges related to nutrition<sup>(1)</sup>. Worldwide, levels of obesity are on the rise<sup>(2)</sup>, and Norway is no exception<sup>(3)</sup>. At the same time, hunger and undernutrition contribute to an estimated 35% of the almost 10 million child deaths annually and 11% of the total global disease burden<sup>(4)</sup>. The need for skills and competence to address the very slow progress in resolving these nutritional problems in a sustainable way is evident.

The specialisation in nutrition aiming at promoting a nutritionally adequate diet and preventing nutrition-related health problems in groups and populations has been called Public Health Nutrition<sup>(5)</sup>. We have chosen to expand our definition of this subject area to extend beyond the public health sphere. Thus, in our understanding, public health nutrition should also cover several other dimensions such as food systems, food culture, public policies, human rights and capacity building<sup>(1,6,7)</sup>.

Nutrition training in Norway has long traditions. The State's school for home economics teachers was initiated

in 1909. This school became part of Akershus University College (HIAK) in 1994. Over the years, the training programme developed and incorporated an increasing focus on nutrition. As the need for more academic nutrition training evolved, a 2.5-year Nordic nutrition training programme was commenced at the University of Oslo in 1966. In the beginning, the training programme was meant for home economics teachers. The University of Oslo offers today a 3 + 2-year bachelor and master study programme in nutrition where the main emphasis is on clinical nutrition, but with possibilities of focusing on public health nutrition and nutrition biology. About twenty students are accepted each year. A major change in the nutrition educational system in Norway was that the 3-year home economics teachers' training was closed down in 2002. Thus, the in-depth nutrition and home economics training combining practical and theoretical skills disappeared. The reduced training capacity combined with an increasing need for nutritionists led to a lack of public health nutritionists in Norway. Consequently, HIAK considered starting a new training programme in public

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**Fig. 1** Level of objectives and functions<sup>(15)</sup>

health nutrition in order to answer the need for competent nutritionists.

Therefore, HIAK did a survey in 2002 to give input to and be a basis for developing a curriculum for a new bachelor study programme in public health nutrition. Potential employers of public health nutritionists were asked about which functions they would expect a public health nutritionist should be able to perform, if they were to hire one. Most of the previous studies on the topic describe which skills and competencies\* nutrition professionals deem as most important, e.g. in Australia<sup>(8)</sup>, the USA<sup>(9–11)</sup>, Latin America<sup>(10)</sup>, the UK<sup>(12)</sup> and a range of Western countries<sup>(13)</sup>. We chose to interview potential employers, in order to get the opinion and perspective of outsiders of the nutrition community; thus our focus on functions. This fits well into Hughes’ conceptual framework for analysing public health nutrition workforce development<sup>(14)</sup>, and can be seen as stage three of the framework: work needed and core functions. An employer will expect the employee to perform certain tasks and functions to a standard<sup>(15,16)</sup> and this requires an adequate mixture of skills and competencies. The links between functions, activities, tasks and skills, and the link to learning objectives, are shown in Fig. 1<sup>(15)</sup>.

Selected potential employers of public health nutritionists in Norway were presented with a list of thirty-one generic functions. The aims of the present paper are to describe which of these they found most important and to

illustrate how the findings were used in developing a curriculum for a bachelor programme in public health nutrition at Akershus University College.

**Methods**

**Survey instruments**

A questionnaire including a set of functions was developed. The functions were chosen based on literature in the area at that time<sup>(6,10,15,17,18)</sup>. The functions were generic to avoid a too lengthy questionnaire. The questionnaire was reviewed by nutrition experts from various institutions in Norway. The final questionnaire included thirty-one functions in nine themes, as shown in Table 1. For each function, the respondents were asked: ‘If the establishment was to employ a person newly graduated from training along the axis of food–nutrition–health, would the following functions be important?’ with the options yes/no/don’t know. Each theme with two to five suggested functions was followed by an open-ended question inviting the respondent to suggest additional functions or give other remarks. The questionnaire included some questions for background information on what kind of nutrition-related activities the establishment undertook. An electronic questionnaire was made using the web-based software QuestBack (<http://www.questback.com/>). Reminders were sent by email twice to non-responders. An invitation letter highlighted that the survey focused on functions at a generic level, and that basic human nutrition would be included in the planned nutrition training programme.

\* Here the word ‘competencies’ should be understood as how a needed set of skills, knowledge and attitudes are combined in order to perform a specific job.

**Table 1** Functions rated as essential by potential employers of persons trained in public health nutrition\* (*n* 91)

	%
1 Food–health–nutrition in laws and regulations	
1.1 Be familiar with laws and regulations pertaining to food–health–nutrition	87
2 Food–health–nutrition in communication	
2.1 Communicate with the mass media	70
2.2 Provide information about food–health–nutrition at population level and to population groups (e.g. age, disease or ethnic groups)	68
2.3 Provide information about food–health–nutrition to other professions, companies, organisations and other groups	77
2.4 Teach about food–health–nutrition to various groups	55
2.5 Coordinate work in food–health–nutrition between different actors at various levels, internally and externally	58
3 Food–health–nutrition from science to practice	
3.1 Transform scientifically based knowledge to practical advice	74
3.2 Transform advice to practical cooking	35
3.3 Adjust advice on food–health–nutrition to various population groups (e.g. age, disease or ethnic groups)	62
4 Food–health–nutrition in research and assessment	
4.1 Assess and evaluate problems connected to food–health–nutrition in the population/groups of the population (e.g. age, disease or ethnic groups)	41
4.2 Conduct and participate in research related to food–health–nutrition	25
4.3 Give feedback to the target group about the results	66
4.4 Popularise results from research	55
5 Food–health–nutrition in project work	
5.1 Manage projects in food–health–nutrition	46
5.2 Monitor projects in food–health–nutrition	58
5.3 Conduct projects in food–health–nutrition	57
5.4 Evaluate projects in food–health–nutrition	56
6 Food–health–nutrition in policy and planning	
6.1 Develop plans and strategies for food–health–nutrition	54
6.2 Plan projects and programmes for food–health–nutrition	55
7 Food–health–nutrition in administration and management	
7.1 Handle budgets	26
7.2 Take leadership	25
7.3 Take responsibility for personnel	13
8 International work in food–health–nutrition	
8.1 Report on central topics in the international debate on food–health–nutrition	22
8.2 Advise Norwegian organisation on global topics related to food–health–nutrition	18
8.3 Participate in Norwegian delegations to international meetings and conferences	21
8.4 Be part of teams to assess problems related to food–health–nutrition in developing countries	10
8.5 Provide consultancies for developmental organisations working with food–health–nutrition in developing countries	7
8.6 Collaborate across languages and cultures	34
9 Food–health–nutrition in information and communication technology	
9.1 Handle statistical software (e.g. SPSS)	37
9.2 Handle database software (e.g. Access)	41
9.3 Handle nutrition-specific software (e.g. for calculating nutrient intake)	53

\*Those who answered 'yes' to the question 'If your establishment would employ a person newly graduated from training along the axis of food–health–nutrition, would the following functions be essential?' The table is ordered according to frequencies and not to the sequence in the questionnaire.

### Sampling

Eligible participants in the survey were any potential employer of a public health nutritionist in Norway. Relevant public institutions (dealing with policy, research, interventions and health), organisations (governmental and non-governmental) and private sector (industry, media and consultancies) were identified, and 221 establishments were invited to participate. The sample was meant to include the most relevant actors from the point of view of the authors and was thus not random. Health services at communal level were included from only one county, Akershus; this is the second most populous of Norway's nineteen counties.

Of the 221 invited establishments, ninety-nine responded (response rate of 45%; see Table 2). However, the real response rate was only 41% since eight respondents had left most questions unanswered. The largest group of respondents was representing district offices of the Norwegian Food Safety Authority (34% of the sample).

This was followed by Chief County Medical Officers (14%), and other organisations and associations (12%). Response rate in various categories of respondents varied considerably (Table 2).

### Data analysis

The data were transferred from QuestBack to the SPSS statistical software package version 11.0 (SPSS Inc., Chicago, IL, USA) and analysed statistically. Since there were few respondents in each category, only descriptive statistics (frequencies) were used.

### Curriculum development approach

A framework described in the WHO *Educational Handbook for Nutrition Trainers*<sup>(15)</sup> was chosen as the pedagogical basis for the curriculum development. The handbook describes the relationship between professional functions and educational objectives, as shown in

**Table 2** Participants in the survey among potential employers of public health nutritionists (*n* 99)\*

	No. responding	No. invited	Response rate in each category (%)
Regional Food Safety Authority offices	34	78	44
Chief County Medical Officers	14	18	78
Organisations (non-governmental and governmental)	12	17	71
Public institutions (research, intervention)	8	15	53
Local health service in Akershus County	7	20	35
Developmental organisations	6	8	75
Food companies/stores	6	19	32
Health regions	5	17	29
Relevant ministries (health, agriculture) with their directories and services	3	18	17
Information offices	3	3	100
Newspaper/magazine	2	4	50
Associations for nutritionists	0	4	0

\*Eight respondents had left most questions unanswered.

**Table 3** Nutrition-related activities conducted by the responding establishments (%)

Establishment ( <i>n</i> )	Research	Assessment	Information	Interventions	International work
Regional Food Safety Authority offices (34)	0	44	67	47	6
Chief County Medical Officers (14)	0	29	100	85	0
Organisations (non-governmental and governmental) (12)	25	50	83	58	33
Public institutions (8)	50	75	75	51	75
Local health services in Akershus County (6)	0	67	100	100	0
Developmental organisations (6)	33	67	67	67	83
Food companies/stores (6)	83	83	67	67	100
Health regions (5)	20	100	80	80	20
Ministries with their directories and services (3)	0	67	100	100	100
Information offices (3)	0	100	100	100	33
Newspaper/magazine (2)	0	0	0	0	0
Total (99)	15	54	78	64	29

Fig. 1. The functions or set of activities a nutritionist is expected to be able to perform correspond to the general educational objectives. The more specific level of action has been called professional activities, corresponding to intermediate objectives. The most specific level of action is professional tasks, which corresponds to specific learning objectives. A task has been defined as 'a set of actions necessary to the fulfilment of a given activity'<sup>(15)</sup>. In order to conduct a task satisfactorily, various skills will be required, e.g. intellectual skills, communication skills or practical skills. Most often, a combination of skills is needed<sup>(17)</sup>.

## Results

### Findings from the survey

Table 3 shows the various types of nutrition-related activities undertaken by the respondents (*n* 99). The most frequent activity was nutrition information and educational work, answered by 78% of the respondents. Nutrition interventions were conducted by 64% of the respondents, and assessment and evaluation of the nutrition situation by 54%.

As presented in Table 1, the function that was most frequently rated as important was to be familiar with laws and regulations pertaining to food–health–nutrition (87%). This was particularly underlined by the local Food

Safety Authority offices, among which 90% rated this function as important. However, also among the other categories, as many as 85% found this function important. A typical comment to this question was:

This is the basis for all our work. (Representative from a local Food Safety Authority office)

Various forms of nutrition communication were prioritised by the majority of the respondents (able to provide nutrition information to other professions (77%), provide nutrition information to various population groups (68%) and to communicate with the mass media (70%)). Teaching nutrition and coordinating nutrition-related activities were important for about half of the respondents, the ability to transform scientifically based knowledge to practical advice was important for 74%, whereas to be able to adjust the advice given to various population groups was central to 62%. The ability to transform scientific information to practical cooking was seen as important by fewer (35%). Examples of additional suggestions of functions were:

To be creative and innovative in order to give practical advice. (A local Food Safety Authority office)

To be able to advocate for nutrition to improve national laws and regulations. (Norwegian Consumer Council)

The most emphasised function in relation to research and assessment was to give feedback to target groups about results from research (66%), followed by popularise results from research (55%). To be able to assess nutritional problems in population groups was rated important by 41%. A representative from the industry said:

The nutrition person must be able to interpret results from research.

In the fields of administration and management the respondents found leadership (25%) and budget handling (26%) more important than responsibility for personnel (13%). Generally these issues scored low; however, some added:

The person must be able to lead meetings and be responsible for personnel.

The most emphasised function in international work was the ability to collaborate across cultures; this was mentioned by 34% of the respondents. Several of the comments from the respondents reflected their current work or future plans for operating in multicultural settings in Norway, e.g.

To collaborate across cultures will be important concerning interventions for immigrant groups. (A local Food Safety Authority office)

Many of the respondents reported handling of nutrition software as an important function (53%). There were two other functions in the fields of information and communication technology, i.e. to handle statistical software and database software, which were important for 37% and 41%, respectively. Development of Internet pages and the ability to search scientific literature were functions that were also mentioned by some.

### **Curriculum development**

The findings from the survey were used as a basis for developing learning objectives for the bachelor programme, following the methodology described earlier<sup>(15)</sup>. The functions were converted into general learning objectives. A total of twelve general objectives were developed. This can be exemplified with how the functions related to communication were grouped into one general objective:

After ended training, the students should be able to adequately communicate, advise, and pass on scientifically based information in nutrition to individuals and different population groups and professions, via different channels and arenas, and give practical demonstrations on preparation of food.

This objective contains several skills to be obtained throughout the 3-year bachelor programme, such as intellectual skills (knowledge), communication skills and practical skills (such as cooking demonstrations). The

curriculum was built up in a way that shows the significance of each specific objective (skill to be learned), in relation to the functions that the student should be able to do after the training programme. When the curriculum and study plan were ready they were reviewed by nutrition experts from various institutions in Norway, both academic and governmental. They were asked to comment on the learning objectives, the structure and the content. According to the time specified for a bachelor programme, and the felt relevance by the staff at HIAK, a final revision was made. In the spring of 2008 the first batch of bachelor trained public health nutritionists had their final examination.

### **Discussion**

The generalisability of the survey is limited due to bias in the sample and a low response rate. The sampling was done based on the research group's knowledge of establishments and institutions working in the field of nutrition in Norway. However, Norway is a small country with relatively few actors in the field of nutrition. A real attempt was made to include most establishments that could possibly be interested in employing a public health nutritionist. The sample was heterogeneous, non-random, and included a wide range of institutions. Local Food Safety Authority offices comprised the largest group of respondents (34%). This may not reflect the real distribution of employers of public health nutritionists in Norway. Currently, relatively few of the local Food Safety Authority offices employ nutritionists.

One cause of the low response rate could be that some of the institutions invited to participate did not see the link with public health nutrition and therefore chose not to reply. Another reason could be that a web-based questionnaire was used. This was in 2002 when web-based solutions were quite new to some people.

The number of suggested functions in the questionnaire was also limited. However, the respondents did not provide many new functions although they had the possibility to do so. The Delphi method used e.g. by Hughes<sup>(13)</sup> could have better captured an agreement of the range of suggestions that came from the respondents.

The curriculum, including the final learning objectives, was formed not based on the survey alone, but also supplemented by inputs from external sources: the review of the curriculum by nutrition experts from various institutions, the scientific literature and by the staff at HIAK. The curriculum development led to twelve general objectives. For attaining each objective, several skills would be needed. Each skill would require several levels of competencies.

The function the most frequently considered important to the respondents was related to food and nutrition laws and regulations. This finding was expected among the

main category of respondents, namely the Food Safety Authority offices. More surprising was that most other respondents also rated this function as essential. The increasing emphasis on laws and regulations related to food – nationally, regionally and internationally – might be an explanation for this result. Knowledge of laws and regulations were not among the suggested competencies for public health nutrition in the comprehensive study by Hughes<sup>(13)</sup>.

Functions related to communication were also rated as important by most respondents. To communicate with the mass media and provide information about food, nutrition and health to various groups were considered as important functions. This may appear as a strong, perhaps naïve, belief that nutrition education alone is effective. However, lack of knowledge is often not the main barrier to a healthy lifestyle. Most effective interventions to e.g. prevent obesity have been shown to be those that are addressing several aspects of diet and physical activity<sup>(19)</sup>. At the same time, to communicate nutrition information is generally viewed as an important part of nutrition professionalism<sup>(13,20)</sup>. The consequence for the curriculum was a firm emphasis on communication skills, including health literacy analysis<sup>(21)</sup>. Other strategies and approaches to improve diet and nutrition are also emphasised in the final curriculum. This includes policies and programmes at various levels (community, national and global) and in various sectors (health, agriculture, education, etc.).

The example of an objective presented in the current paper concerns communication. Although most respondents did not find practical cooking important, we included it in this main objective. This illustrates that not only the employers' opinions were taken into consideration; several of the nutrition experts reviewing the curriculum highlighted a minimum knowledge of practical cooking as an important part of a public health nutrition curriculum.

Most other studies of competencies for public health nutrition have been conducted among nutrition professionals<sup>(9,10,13)</sup>. The respondents in our survey were representing organisations or establishments, and thus provided input not only from nutrition professionals. The questionnaire therefore listed the various functions in more lay and generic terms than what had been used in other surveys we have seen. Despite these differences, many of the functions that were identified as most important were similar to those found by others<sup>(9,10,13)</sup>.

## Conclusion

Despite the bias of the sample and the weaknesses in the survey design, the survey gave very useful inputs to the development of a curriculum for a new bachelor training programme in public health nutrition. The priorities and viewpoints of the potential employers were used in

developing the general, intermediate and specific objectives. It should have helped to make the study programme more relevant to the real world situation that awaits the graduated public health nutritionist. All in all we consider the training programme partly based on the survey to be fairly balanced and relevant for the challenges public health nutritionists will face in the local community. Continued follow-up and modifications according to experiences, reviews and evaluation are however necessary.

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*Authorship responsibilities:* A.O. conceived the project. A.O., G.I.G., L.E.T. and I.B. designed the study. G.I.G. collected the data and did the preliminary analyses. L.E.T. drafted the manuscript. All authors contributed to the writing of the manuscript.

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