PhD curriculum in Clinical and Public Health Nutrition

Overview, structure, syllabus, evaluation

Key information

- Duration: 2.5 years
- Language: English
- Credits: 25 (core module: 13, dissertation: 24)

Title: Clinical and Public Health Nutrition

Teaching Institution: National Nutrition and Food Technology Research institute (NNFTRI)

Degree: PhD.

Overview

The Clinical and Public Health Nutrition program offered at the National Nutrition and Food Technology Institute provides a comprehensive overview of nutrition in modern clinical practice and the application of evidence based nutritional support across the community and offers specialized training in the clinical and scientific basis of under and over nutrition, and therapeutic approaches to correcting this in the clinic, community and educational setting.

This PhD is suitable for candidates who wish to pursue a career in cutting-edge research, the practice of nutrition therapy in the health services.

Admission requirement

The applicants must hold at least M.Sc. in nutrition. Higher education degrees will be given preference. Applicants with other backgrounds than nutrition including public health, medicine, dentistry, veterinary, pharmacy, nursing and midwifery are also welcomed. Students from a non-nutrition background are welcome to apply. However, they will have to cover the prerequisite credits accordingly upon acceptance.

Employment Status of Graduates

Destinations and job roles of recent graduates include:

- Nutritionist

- Nutrition Support and Research Dietitian

- Lecturer in Nutrition

- Health Programs Manager

- Researcher

Duration

2.5 years (30 months)

Language

The English language level for this program is: Standard

Credits

The program consists of seven core modules (13 credits) and a research dissertation (12 credits).

Upon successful completion of 25 credits, students will be awarded a PhD in Clinical and Public Health Nutrition.

Core module

Code	Term	credits		Hours	
		Theoretical	practical	Theoretical	practical
Nutrition-related chronic disease	1	2		34	
Advanced Biostatistics	1	2		34	
Community Nutrition	1	2			
Biomarkers and nutrition indicators in health and disease	1	2			
Advanced Research Methodology	1	2		34	
Advanced Applied Nutrition	1	2		34	
Seminar	2	-	1	-	
Research Project	2		12		
Research Project (Dissertation)	3		12		
Research Project (Dissertation)	4		12		
Research Project (Dissertation)	5		12		

Non-core module

Non-core modules will be provided based on the topic of students' dissertation.

Program Structure and features, modules, credit assignment and award requirements:

Full-Time M.Sc.	Semester 1	Semester 2	Semester 3	Total credits
Core modules	12	1	---	13
Dissertation	---	12	12	24

Evaluations:

The students will be evaluated through individual module assessments (which may include essays, other written coursework, short written exams, practical exams, group-work, presentations or other methods), formal summer exams, and a project report. Such tasks are designed to assess, via the most appropriate method, whether learning objectives have been met.

Modules:

Nutrition-related chronic disease Syllabus

Module Title: Nutrition-related chronic disease

Prerequisite or co-requisite: None

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research; Department of Community Nutrition; National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences.

Description:

This unit covers issues in nutrition and public health, with an emphasis on how nutrition research is translated into dietary recommendations for chronic disease prevention. The process of effectively and efficiently identifying, reading, and synthesizing existing sources of reliable information on particular diet disease associations will be covered extensively as will applying this knowledge in a public health context. We will focus on the relation of nutrition to obesity, diabetes, coronary heart disease, hypertension, and selected additional health outcomes of public health significance in the world.

Learning objectives:

By the end of this course, student will be able to:

- Justify why all ages are part of the continuum of opportunities for the prevention and control of chronic disease.

- Differentiate between the leading chronic diseases, their risk factors and recommended diets.

- Examine the relationship obesity, diet, excess weight gain, and physical activity have on chronic disease.

- Examine food consumption patterns and trends as they pertain to chronic disease development.

- List the risk factors of chronic diseases.

- Finally, the student will be able to:

- Apply principles of nutrition to health promotion and disease prevention.

- Translate nutrition principles and research findings into intervention strategies for specific populations.

- Identify the influence of eating behaviors on disease development and prevention.

- Explain the role of macro and micronutrients for nutritional health and well-being.

Outlines

Sessions	Topics	Reference/ chapter	Hours
1.	An overview of nutrition epidemiology	1/chapter1	2
2.	An overview of leading chronic diseases and their risk factors	2/chapter 2; 3/chapter 4	2
3.	An overview of nutrition epidemiology of obesity, diabetes, coronary heart disease, hypertension	2/chapter3; 5/ chapter 2&3	2
4.	Global burden of chronic diseases	2 /chapter 1; 6/ chapter 2	2
5.	Role of macro and micronutrients for nutritional health and well-being	6 /chapter 3	2
6.	Food, Nutrition and Health in a Global Perspective	6/chapter 4	2
7.	Food consumption patterns	6/chapter 4	2
8.	Role of eating behaviors in disease development and prevention	6/chapter 4	2
9.	Trend of food pattern alteration and its relationship with the pattern of diseases in the population	6/chapter 3	2
10.	Nutrition-health policy issues in relation to NCDs (1)	5/chapter 12	2
11.	Nutrition-health policy issues in relation to NCDs (2)	5/chapter 12	2
12.	Health Promotion and Applied Research Methods in Global Health (1)	9/chapter 1-3	2
13.	Health Promotion and Applied Research Methods in Global Health (2)	9/chapter 1-3	2
14.	Policy making	4/chapter 14-15	2
15.	Introduction to public health	7/chapter 1; 8/chapter 2	2
16.	Public Health, Nutrition & Wellbeing in a Global Perspective	7/ chapter 3	2

Reference:

1. Willett, W. Nutritional Epidemiology. United Kingdom: OUP USA. Last edition.

2. Mathers, C., Fat, D. M., Boerma, J. T. The Global Burden of Disease: Last Update. Philippines: World Health Organization.

3. Global Burden of Disease and Risk Factors. Ukraine: World Bank Publications. Last edition.

4. Global Handbook on Non communicable Diseases and Health Promotion. Germany: Springer New York. Last edition.

5. An Introduction to Population-Level Prevention of Non-Communicable Diseases. United Kingdom: Oxford University Press. Last edition.

6. Diet Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation. Switzerland: World Health Organization. Last edition.

7. Public Health Nutrition: From Principles to Practice. United Kingdom: Taylor & Francis. Last edition.

8. Hughes, R., Margetts, B. M. Practical Public Health Nutrition. United Kingdom: Wiley. Last edition.

9. Principles of Applied Research Methods. United States: Sage. . Last edition.

Advanced Biostatistics Syllabus

Module Title: Advanced Biostatistics

Prerequisite or co-requisite: None

Credits: 2

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Biostatistics department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences; Nutrition Research department, National Nutrition and Food Technology Research Institute

Description: The focus in this course is on the application of statistical and epidemiological approaches in public health and clinical research, which covers selection of appropriate method.

Learning objectives:

By the end of this course, student will be able to:

- Identify advanced concepts and techniques of descriptive and inferential statistics with applications in health care, medicine, public health, and epidemiology.

- Describe advanced statistics, including Comparing more than two groups, Regression models, Roc curve analysis

- Apply the analytic methods in the field of health promotion, epidemiology, and program evaluation.

Outlines:

Sessions	Topic	Reference/ chapter	Hours
1.	Appropriately utilize qualitative and quantitative data in order to effectively address public health and clinical problems,	2/chapter 38	2
2.	An overview of basic statistics	1/chapter 1	2
3.	An overview of basic statistics	1/chapter 1	2
4.	Comparing more than two groups (continuous outcomes): Analysis of covariance ANCOVA	1/chapter 8	2
5.	Comparing two groups (categorical outcomes): Chi-square test	2/chapter 16, 17	2
6.	Teamwork, Lab1		2
7.	Repeated Measures of Analysis of variance	1/chapter 9	2
8.	Correlation	1/chapter 10	2
9.	Linear Regression	2/chapter 10	2
10.	Teamwork, Lab2		2
11.	Multiple predictor variables: Multiple regression I	2/ chapter 11 1/chapter 11	2
12.	Multiple predictor variables: Multiple regression I I	2/ chapter 11 1/chapter 11	2
13.	Multiple predictor variables: Logistic regression I	2/ chapter 19, 20 1/chapter 13	2
14.	Multiple predictor variables: Logistic regression I I	2/ chapter 19, 20 1/chapter 13	2
15.	Roc curve analysis	1/chapter 3	2
16.	Teamwork, Lab3		2

References:

1- Barbara Hazard Munro, Statistical Methods for Health Care Research, Lippincott Williams & Wilkins, 2005
2- Betty R. Kirkwood, Jonathan A. C. Sterne, Essential Medical Statistics, Wiley, 2010

Community Nutrition Syllabus

Module Title: Community Nutrition

Credits: 2

Prerequisite or co-requisite: Basic nutrition, public health, Nutrition assessment, lifespan nutrition

Module type: theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research; Research Department of Food and Nutrition Policy and Planning, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences

Description:

This module focuses on identifying and analyzing current issues in international and community nutrition and the methods to improving them. It provides students with sufficient knowledge and skills necessary to conduct effective community nutrition programs. We will cover the concept of community, the role of nutrition in health promotion and perspectives for resolving community nutrition problems. It also covers needs assessment issues and national and local community nutrition programs, determinants of health outcomes, measurement of nutrition and health status, food and nutrition policies and legislation, and monitoring of community programs. Finally, the concepts and knowledge required for the delivery of community nutrition services will be applied to program planning, intervention and program evaluation.

Learning objectives:

By the end of this course, student will be able to:

- Define community nutrition and recognize its importance.

- Describe community nutritionist's professional roles and responsibilities, including advocacy.

- Conduct food and nutritional assessment of the community.

- Identify data collection methods commonly used in community assessments.

- Distinguish between community nutrition and nutritional related diseases.

- Identify and appreciate cultural barriers to health promotion/disease prevention

- Describe the principles of effective community nutrition programs.

- Appreciate the nutritional needs of each category in the community.

- Develop national nutrition policies.

Outlines:

Session	Topics	Reference/chapter	Hours
1.	Introduction to public health and community nutrition The role of nutrition in health promotion.	6/Chapter1, 2	2
2.	Objectives of, and services provided by the community nutrition programs	6/Chapter 1	2
3.	Goals of a community needs assessment Nutritional needs assessment	2/chapter 3	2
4.	Sources of data for conducting a community assessment	1/Chapter15 2/Chapter 3	2
5.	Different methods for assessing nutritional status and health in the community	3/Chapter 1	2
6.	Social determinants of health and their implications in community nutrition research and practice	3/Chapter 3	2
7.	Current status of food security and government and international program running in the field of community nutrition	6/Chapter 11 3/Chapter 6	2
8.	Nutrition intervention for vulnerable population	2/Chapter 4	2
9.	Designing and implementing a community nutrition program	1/Chapter 15	2
10.	Principles of Planning Effective Community Nutrition Programs	2/Chapter 14	2
11.	Theories and Models for Health Promotion and Changing Nutrition Behavior	5/Chapter 5, 6	2
12.	Cultural influences and public health nutrition	3/Chapter 2	2
13.	Evaluation of a community nutrition program	3/Chapter 16	2
14.	Implementing Nutrition Interventions in Low- and Middle-Income Countries	3/chapter4	2
15.	Maternal and Child Nutrition in Low- and Middle-Income Countries	6/chapter 14, 15, 17	2
16.	Process of policy-making and developing legislative and regulatory	2/Chapter 5, 6	2

References:

1. Boyle, M.A. Community Nutrition in Action. 2017 (7th edition). Boston, MA: Centgage Learning.

2. M Kaufman. Nutrition in Promoting the Public's Health; Strategies, Principles, and Practices. 2007.

3. Merson MH, Black RE, Mills AJ. Global Health. Burlington. 2011. (3rd edition). MA: Jones & Bartlett Learning.

4. Allen L, Gillespie S. What works? A review of the efficacy and effectiveness of nutrition interventions. ACC/SCN Nutrition Policy Paper no.19, ADB Nutrition and Development Series No. 5. Manila: Asian Development Bank, 2001.

5. M Gibney; M Barrie. Public Health Nutrition. Margetts and John M. Kearney (ed.) 2004.

6. Spark A, Lauren M. Dinour, Janel Obenchain. Nutrition in Public Health Principles, Policies, and Practice, Second Edition. 2021. CRC Press

Biomarkers and nutrition indicators in health and disease Syllabus

Module Title: Biomarkers in nutritional assessment

Prerequisite or co-requisite: Basic nutrition, biochemistry, practical nutrition assessment

Credits: 2

Module type: Theoretical

Instructor(s)/Department(s): Faculty members of the Department of Nutrition Research, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences

Description:

This course includes basic concept of biomarkers in nutritional assessment, their classification as well as their advantages and limitations. An overview of the new omics technology and their use in nutrition research is also provided. The student is expected to have an active contribution to the class through participation in discussions and presenting lectures.

Learning objectives:

By the end of this course, student will be able to:

- Define biomarkers commonly used in nutritional assessment at both clinical setting and community-based research.
- Interpret results of nutritional biomarker determinations.

Outlines

Session	Topics	Reference/chapter	Hours
1	Definition and classification of biomarkers; confounding factors in interpretation of biomarkers	2/chapter1	2
2-3	Biomarkers of exposure; biomarkers of status	1/chapter14-22; 2/chapter15	4
4-6	Biomarkers of function	1/chapter 29-33; 2/chapter15.4	6
7	Selecting nutritional biomarkers	2/chapter15.5	2
8-9	Evaluation of the selected nutritional biomarkers	2/chapter15.6	4
10-11	Nutrigenetics	1/chapter23-26; 2/chapter15.7	4
12-13	Proteomics, Metabolomics	2/chapter15.7	4
14-15	Lipidomics, Transcriptomics	2/chapter15.7	4
16-17	Exposome and Exposomics	3-4	4

References

1. Gibson RS. Principles of nutritional assessment. Biomarkers. 3rd ed., 2021. https://nutritionalassessment.org/biomarkers/

2. Vineis P, Chadeau-Hyam M, Gmuender H, Gulliver J, Herceg Z, Kleinjans J, Kogevinas M, Kyrtopoulos S, Nieuwenhuijsen M, Phillips DH, Probst-Hensch N. The exposome in practice: design of the EXPOsOMICS project. International journal of hygiene and environmental health. 2017 Mar 1;220(2):142-51.

3. Fang M, Hu L, Chen D, Guo Y, Liu J, Lan C, Gong J, Wang B. Exposome in human health: Utopia or wonderland?. The Innovation. 2021 Nov 28;2(4):100172.

Advanced Research Methodology Syllabus

Module Title: Advanced Research Methodology

Prerequisite or co-requisite: Basic nutrition

Credits: 2

Module type: Theoretical

Instructor(s)/Department(s): Faculty members of Biostatistics department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences; Nutrition Research department, National Nutrition and Food Technology Research Institute

Description:

This course is designed to introduce new Ph.D. students to a selection of research topics and tools commonly used in the fields of nutrition and food sciences. Topics to be covered include methods of literature review, data analysis and presentation, and research ethics. In addition, the course will include an introduction to various types of food and nutrition research, including behavioral research, qualitative research, and clinical trials research.

Learning objectives:

By the end of this course, student will be able to:

- Select research topics and tools used in the fields of nutrition and food sciences
- Describe methods of literature review, data analysis and presentation, and research ethics.
- Identify and use various types of food and nutrition research

Outlines:

Sessions	Topics	Reference/ chapter	Hours
1.	Meaning, Concept, Nature, Steps, Types and Characteristics of research. Scientific Inquiry Philosophical and Sociological foundations of research Interdisciplinary approach and its implications in various research area	1/chapter 1	2
2.	Qualitative and quantitative methods of research-1	1/chapter 4, 5	2
3.	Qualitative and quantitative methods of research-2	1/chapter 4, 5	2
4.	Qualitative and quantitative methods of research-3	1/chapter 4, 5	2
5.	Qualitative and quantitative methods of research-4	1/chapter 4, 5	2
6.	Concept of sampling and other concepts related to sampling. Probability and non-probability samples, their characteristics and implications-1	1/chapter 6	2
7.	Concept of sampling and other concepts related to sampling. Probability and non-probability samples, their characteristics and implications-2	1/chapter 6	2
8.	Tools of data collections, their types, attributes and uses. Redesigning, research tools-like questionnaire, observation, interviews, scales and tests etc-1	2/chapter 4-10	2
9.	Tools of data collections, their types, attributes and uses. Redesigning, research tools-like questionnaire, observation, interviews, scales and tests etc-2	2/chapter 4-10	2
10.	Analysis of qualitative data based on various tools. Analysis of quantitative data and it presentation with tables, graphs etc. Statistical tools and techniques of data analysis	1/chapter 6 2/chapter 4-10	2

Sessions	Topics	Reference/ chapter	Hours
	Decision making with hypothesis testing through parametric and non-parametric tests. Validity and delimitations of research findings-1		
11.	Analysis of qualitative data based on various tools. Analysis of quantitative data and it presentation with tables, graphs etc.	1/chapter 6 2/chapter 4-10	2
12.	Statistical tools and techniques of data analysis	1/chapter 6 2/chapter 4-10	2
13.	Decision making with hypothesis testing through parametric and non-parametric tests. Validity and delimitations of research findings-2	1/chapter 6 2/chapter 4-10	2
14.	Correction for the effects of measurements error	2/chapter 12	2
15.	Report writing: Meaning and types of reports – Stages in preparation of Report – Characteristic of good report – Structure of the Report- Documentation: Footnotes and Bibliography: Checklist for the Report.	1/chapter 7 2/chapter 13	2
16.	Ethics in Research: What is Ethics in Research & Why is it Important? Ethical issues with human subjects; ethical issues with animal studies. Codes and policies for research ethics; ethical decision making in research	3/chapter 3	2

References:

1. C. George Thomas, Research Methodology and Scientific Writing, Springer International Publishing, 2021
2. Walter Willett, Nutritional Epidemiology, OUP USA, 2013
3. Hilla Brink, Christa Van der Walt, Gisela Van Rensburg, Fundamentals of Research Methodology for Health Care Professionals, Juta, 2006

Advanced Applied Nutrition Syllabus

Module Title: Advanced Applied Nutrition

Prerequisite or co-requisite: None

Credits: 2

Module type: Theoretical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research; Department of Clinical Nutrition and Dietetics, National Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences

Description: Interpret, evaluate, communicate and apply complex nutritional concepts to a wide variety of individuals with gastrointestinal diseases and cancers.

Learning objectives:

By the end of this course, student will be able to:

- Define diet therapy of gastrointestinal diseases and cancers

- Provide the necessary dietary advises in gastrointestinal diseases and cancers.

- develop diets for individuals with nausea, vomiting, dry mouth, reflux, dysphagia, dyspepsia, peptic ulcers, gastrectomy, constipation, diarrhea, steatorrhea, malabsorption, celiac disease, food allergies, food intolerances, inflammatory bowel disease, Irritable bowel syndrome, short bowel syndrome, Blind loop syndrome, diverticular, fistulas, ostomies, intestinal transplants

- Develop diets for patients with acute and chronic hepatitis, fatty liver, liver cirrhosis, liver transplantation, gallstones, acute and chronic cholecystitis, and cholecystectomy.

- Develop diets for patients with acute and chronic pancreatitis.

- Develop diets in cancer prevention, treatment and rehabilitation.

- Develop diets in cancer patients undergoing chemotherapy, radiation therapy, and tumor surgery.

Outlines

Sessions	Topics	Reference/ chapter	Hours
1.	An overview of nutrition assessment	4/chapter 4 & 5	2
2.	An overview of disease status assessment (gastrointestinal disease and cancer)	1/chapter1	2
3.	Pathophysiology of diseases of the upper gastrointestinal tract (mouth, esophagus, stomach)	3/chapter3; 4/chapter27	2
4.	Diet therapy in diseases of the upper gastrointestinal tract (mouth, esophagus): nausea, vomiting, dry mouth, reflux, dysphagia	2/chapter 7; 4/chapter 27	2
5.	Diet therapy in diseases of the upper gastrointestinal tract (stomach): dyspepsia, peptic ulcers, gastrectomy	4/chapter 27	2
6.	Pathophysiology of diseases of the lower gastrointestinal tract: malabsorption, celiac disease, food allergies, food intolerances, inflammatory bowel disease, Irritable bowel syndrome, short bowel syndrome	1/chapter3; 4/chapter 28	2
7.	Pathophysiology of diseases of the lower gastrointestinal tract:	4/chapter 28	2
8.	Diet therapy in diseases of the lower gastrointestinal tract: constipation, diarrhea, steatorrhea, Blind loop syndrome, diverticular, fistulas, ostomies, intestinal transplants	2/chapter7; 4/chapter 28	2
9.	Pathophysiology of liver diseases	1/chapter 4; 4/chapter 29	2
10.	Diet therapy in liver diseases: acute and chronic hepatitis, fatty liver, cirrhosis, liver transplantation	4/chapter 29; 5/chapter82	2

Sessions	Topics	Reference/ chapter	Hours
11.	Pathophysiology of pancreatic and biliary diseases	1/chapter 5; 4/chapter 29	2
12.	Diet therapy in pancreatic and bile diseases: acute and chronic pancreatitis, gallstones, acute and chronic cholecystitis, and cholecystectomy	5/chapter81; 4/chapter 29	2
13.	Pathophysiology of cancer	4/chapter 36	2
14.	An overview of cancer prevention, treatment and rehabilitation	4/chapter 36; 6/chapter 1-2	2
15.	Diet therapy in chemotherapy, radiation therapy	4/chapter 36 6/chapter 3; 7/chapter 8-9	2
16.	Diet therapy in tumor surgery	4/chapter 36; 7/chapter 10	2

References

1. Mark DeLegge. Nutrition and Gastrointestinal Disease. Netherlands: Humana Press. Last edition.

2. Alan Buchman. Clinical Nutrition in Gastrointestinal Disease. United Kingdom: SLACK. Last edition.

3. Miranda Lomer. Advanced Nutrition and Dietetics in Gastroenterology. United Kingdom: Wiley. Last edition.

4. Krause's Food, Nutrition, & Diet Therapy. India: Saunders. Last edition.

5. Escott-Stump, S. Nutrition and Diagnosis-related Care. United Kingdom: Williams & Wilkins. Last edition.

6. Ney, D. M., Zeman, F. J. Applications in Medical Nutrition Therapy. United Kingdom: Merrill. Last edition.

7. Modern Nutrition in Health and Disease. Germany: Lippincott Williams & Wilkins. Last edition.

8. Malone, A., Charney, P. ADA Pocket Guide to Nutrition Assessment. United States: American Dietetic Association. Last edition.

9. Marian, M., Roberts, S. Clinical Nutrition for Oncology Patients. United States: Jones & Bartlett Learning. Last edition.

10. Molseed, L. L., McCallum, P. D. The Clinical Guide to Oncology Nutrition. United States: American Dietetic Association. . Last edition.

Seminar Syllabus

Module Title: Seminar

Prerequisite or co-requisite: None

Credits: 1

Module type: Practical

Instructor(s)/Department(s): Faculty members of Department of Nutrition Research, National Nutrition and Food Technology Research Institute, Shahid Beheshti University of Medical Sciences

Description

In this course, students will have to present a lecture on a current problem of clinical or public health nutrition using critical search and data analysis under the supervision of the instructor(s).

Research Project Syllabus

Module Title: Research project (Dissertation)

Prerequisite or co-requisite: None

Credits: 12

Module type: Practical

Description

The students will conduct an original research on a hot topic in clinical or public health nutrition using a problem-solving approach under the supervision of the instructor(s). Multidisciplinary project are specifically encouraged.