

Exploring Pathways for Developing Clinical Nutrition Internship Teaching Competencies from a New Medical Perspective

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Abstract

In the medical nutrition professional education system, clinical internships are a critical component in cultivating students' job competence. This paper focuses on the clinical internship teaching model for medical nutrition professionals in the new medical field, exploring a set of effective teaching methods to enhance students' professional literacy and practical skills. By analyzing the concept of job competency, the importance of clinical internship supervision in medical nutrition, and the current state of such supervision, this study constructs a clinical internship supervision model oriented toward job competency. It discusses the practical effectiveness of this model, aiming to enhance the comprehensive abilities of medical nutrition students, strengthen their employment competitiveness, and provide new insights and methods for the cultivation of medical nutrition talent.

Keywords

Medical Nutrition, Job Competency, Clinical Internship

1. Introduction

In the current context of rising health demands and accelerating changes in medical models, the importance of medical nutrition professionals in disease prevention and control, health management, and other fields is becoming increasingly apparent. Clinical internships are a core component of training medical nutrition professionals and serve as a key bridge between theoretical knowledge and practical work [1]. Under the new medical science paradigm emphasizing interdisciplinary collaboration, precision medicine, and smart healthcare, exploring a clin-

ical internship mentoring model based on job competency is particularly important for improving the quality of professional talent cultivation. Through innovative teaching methods, optimized teaching content, and strengthened practical training, we are committed to cultivating medical nutrition professionals who can flexibly apply their professional knowledge and possess excellent communication skills, teamwork spirit, and professional ethics. This paper briefly discusses the teaching insights gained during the exploration of a clinical internship training model for medical nutrition majors, guided by job competency, within the new medical science perspective.

2. Definition of Job Competency

The concept of job competency was first formally proposed by Harvard University professor David McClelland in 1973. It refers to the comprehensive set of knowledge, skills, abilities, traits, and motivations that an individual must possess to complete work tasks and achieve performance goals in a specific job position [2]. It includes not only observable external behaviors, such as the application of professional skills, but also internal psychological characteristics, such as work motivation and values [3].

Job competency is given different meanings in different fields. For the field of medical nutrition, a clinical nutritionist must not only have a solid foundation in nutrition science but also possess extensive knowledge of clinical medicine. Additionally, they must demonstrate effective communication skills, exceptional presentation abilities, strong interpersonal and empathetic capabilities, and the ability to present themselves positively. These qualities enable them to provide personalized and humanized nutritional services.

3. The Importance and Current Status of Medical Nutrition Internship Supervision

3.1. The Importance of Medical Nutrition Internship Supervision

Medical nutrition is an interdisciplinary field that combines medicine and nutrition and is an important component of modern clinical medicine. It aims to improve patients' nutritional status, enhance immune function, promote disease recovery, and reduce the incidence of complications and mortality through reasonable nutritional interventions [4]. The knowledge covered includes basic medical knowledge, specialized nutrition knowledge, and clinical medical knowledge, with the aim of cultivating professionals with a solid foundation in medical and nutritional theory who are capable of engaging in nutrition-related work.

Medical nutrition internships can help students transition from theory to practice, systematically learn and master the latest theories, methods, and techniques in medical nutrition, and improve their professional skills. Through nutritional assessments, nutritional education, speech competitions, and other methods, students' language expression skills, communication skills, and accumulation of clinical practice experience are promoted. Standardized internship training helps cul-

tivate more outstanding professionals, injects new vitality into the development of the discipline, meets the growing demand for medical nutrition, and promotes the continuous advancement of the discipline [5]. Medical nutrition professionals trained through high-quality internship programs are better equipped to provide specialized nutritional support and treatment to patients, thereby enhancing the effectiveness of nutritional therapy, improving patients' nutritional status, promoting their recovery, and ultimately elevating the overall quality of healthcare services.

3.2. Current Status of Medical Nutrition Internship Supervision

Medical nutrition internships serve as an important bridge between campus nutrition education and clinical nutrition practice, playing a pivotal role in bridging the two [6]. The traditional “lecture-demonstration-imitation” teaching model, while historically significant, is teacher-centered and emphasizes one-way knowledge transfer. This approach struggles to meet the demands of cultivating versatile medical professionals in the modern era. The mentor is the absolute authority and sole source of knowledge. The initiation, direction, and evaluation of teaching activities are entirely controlled by teachers, while students remain in a passive, receptive role. A uniform curriculum, teaching methods, and assessment standards are applied to all students, disregarding individual differences, prior knowledge backgrounds, and learning styles. Teaching is viewed as a “filling” process, wherein teachers impart knowledge and skills to students. Emphasizing imitation and repetition rather than critical thinking and innovation. This model often prioritizes standardized technical skills while neglecting the cultivation of students' critical thinking, innovative abilities, and humanistic literacy. Moreover, it fails to integrate cutting-edge technologies such as smart healthcare, resulting in a disconnect between education and clinical practice development. For example, Luoyang Vocational and Technical College began enrolling students in its Medical Nutrition program in 2013. Starting in 2016, the college initiated a medical school collaboration, enabling students to undertake internships in hospital clinical nutrition departments. At present, clinical nutrition internships primarily focus on the distribution of enteral nutrition formulas and observational learning in other clinical departments. This approach lacks a systematic, standardized, and comprehensive understanding of clinical nutrition practice, resulting in graduates being unable to promptly and effectively assume responsibilities in clinical nutrition departments. Therefore, cultivating job competency in medical nutrition students requires not only a focus on knowledge acquisition but also an emphasis on whether they possess the practical skills needed for professional practice.

Within the new medical paradigm, clinical nutrition internship supervision is facing unprecedented challenges and opportunities. The traditional “lecture-demonstration-imitation” teaching model, while historically significant, is teacher-centered and emphasizes one-way knowledge transfer. This approach struggles to meet the demands of cultivating versatile medical professionals in the

modern era. This model often prioritizes standardized technical skills while neglecting the cultivation of students' critical thinking, innovative abilities, and humanistic literacy. Moreover, it fails to integrate cutting-edge technologies such as smart healthcare, resulting in a disconnect between education and clinical practice development. Therefore, establishing a new training pathway centered on job competency and driving the transformation of mentoring models from "knowledge transfer" to "capability development" has become an inevitable choice for enhancing the quality of clinical nutrition talent cultivation.

4. Internship Mentoring Model Based on Job Competencies

The cultivation of professional competence in medical nutrition can include the following four aspects: solid professional knowledge and skills, effective communication skills, excellent presentation skills, and proactive self-presentation skills. The internship training model adopted by the Ninth Eighth Ninth Hospital of the Logistics Support Force of the Chinese People's Liberation Army places greater emphasis on practical experience, innovation, and personalization (Figure 1).

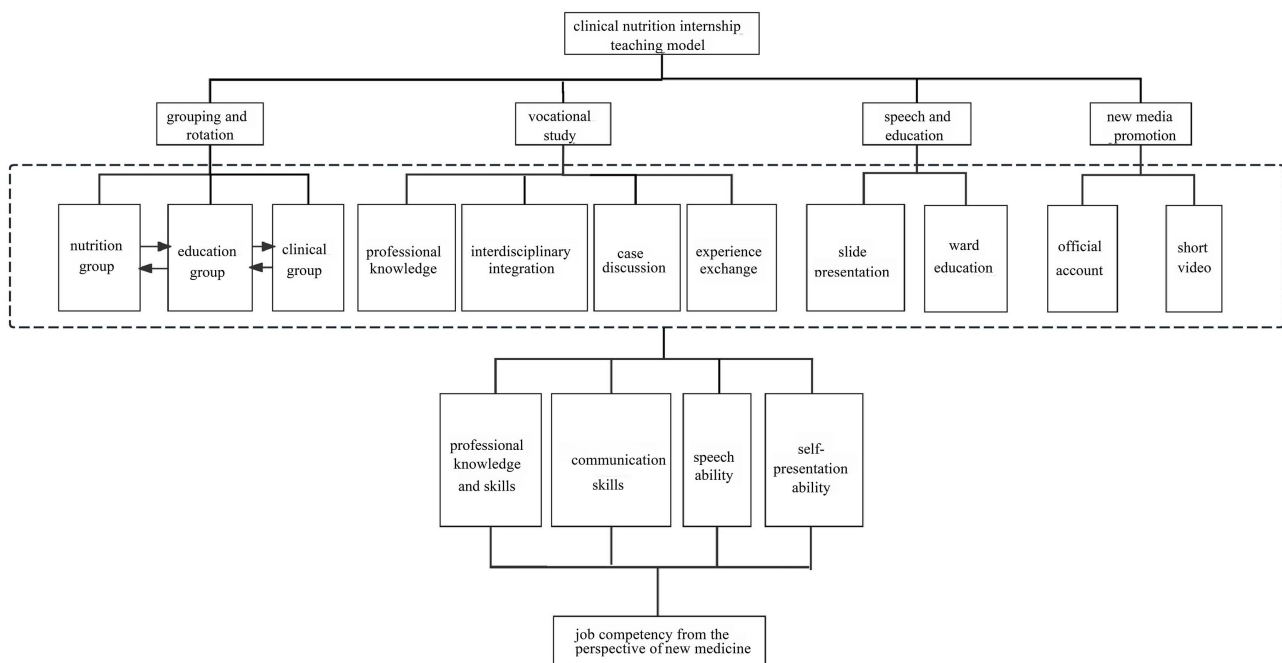


Figure 1. Internship teaching model based on job competency in the context of new medical science.

4.1. Grouping and Rotation

In order to strengthen interns' theoretical knowledge, accumulate practical experience, and enhance their comprehensive abilities during their internship, a group assignment and rotation plan has been developed, as shown in Table 1. Each rotation cycle lasts two months. After completing a rotation cycle, each group hands over to the next group and rotates to the next group.

Table 1. Internship groups and objectives.

Group	Content	Objective
Nutrition group	Nutritional supplement preparation and delivery; accompanying nutritional rounds; outpatient clinic assistance with diagnosis and treatment.	Within the first three months of the internship, master the preparation and operational procedures for nutritional formulations, and become familiar with the indications and contraindications for various nutritional products. Acquire proficiency in nutritional screening and assessment to develop individualized nutritional treatment plans. During the internship period, complete nutritional risk screenings for 200 individuals and nutritional assessments for 100 individuals.
Propaganda group	Produce educational content; conduct nutrition education in clinically relevant departments (one-on-one, one-to-many).	During the internship, we transformed theoretical knowledge into accessible and actionable educational content, deepened my understanding of specialized knowledge, and enhanced communication and teamwork skills. We completed 300 one-on-one educational sessions and 3 group educational sessions.
Clinical group	Assigned to clinical-related departments such as the ICU or oncology department, where you will shadow clinical instructors to learn specialized knowledge.	During the internship, we cultivate clinical reasoning skills and the ability to analyze the relationship between disease and nutrition. Strengthen the clinical nutrition diagnosis and treatment outcomes of the department, and develop the capabilities of specialized nutritionists.

4.2. Business Learning Keeps Pace with the Times

Regular business training can enhance the professional competence of interns and the entire nutrition team, keep pace with industry trends, and comprehensively support the growth of students and the team. The professional training sessions conducted by the Nutrition Department of the 989th Hospital of the Logistics Support Force are a time-honored tradition that has been passed down over the years. These sessions are held every Tuesday afternoon and cover a wide range of topics in a comprehensive manner, employing innovative and diverse learning formats.

4.2.1. Deepening Learning of Knowledge and Technology

Regularly organize learning sessions on the basics of nutrition, providing a detailed analysis of the metabolic processes of macronutrients (carbohydrates, fats, proteins) and micronutrients (vitamins, minerals) in the human body, including how nutrients from different food sources are digested, absorbed, transported, and utilized, to deepen understanding of the fundamental relationship between nutrition and health. Stay up to date with the latest research findings in the field of nutrition, learn about the latest nutrition-related guidelines, and gain insights into the most cutting-edge nutritional recommendations by analyzing guidelines published by authoritative medical institutions both domestically and internationally. This will enable you to promptly update your clinical practice methods. Learn to use artificial intelligence to estimate food energy, analyze its nutritional

content, compare it to the standards of dietary nutrient reference intakes, and provide dietary recommendations.

4.2.2. Interdisciplinary Knowledge Integration Learning

Regularly invite specialists from gastroenterology, neurosurgery, endocrinology, and oncology to discuss the pathogenesis, diagnostic methods, surgical procedures, and treatment advancements of diseases in their fields. Explore the role of nutritional factors in the onset and progression of diseases, and how to integrate with various clinical specialties to provide comprehensive management plans for patients [7]. In collaboration with the Department of Rehabilitation Medicine, we study the nutritional needs of patients in the rehabilitation phase and the impact of nutritional support on the rehabilitation process. We explore how to develop nutritional plans to promote functional recovery in patients with conditions such as fractures and post-stroke sequelae.

4.2.3. Case Discussion and Exchange of Experiences

Typical cases are selected each week for in-depth discussion. In outpatient teaching, actual cases are introduced. For example, in weight management, the responsible nutritionist presents the patient's specific situation, including their dietary habits, disease status, physical measurements, nutritional intervention process, and results. Through case analysis, students will combine the theoretical knowledge they have learned about energy balance and nutrient metabolism with the formulation and implementation of actual nutritional treatment plans, thereby enhancing their ability to solve practical problems [8]. In clinical teaching, through lectures by responsible nutritionists on patient conditions, nutritional risk screening scores, nutritional assessment results, physical measurements, and laboratory indicators, nutritional treatment plans and implementation effects, students jointly analyze the rationality and shortcomings of the plans and propose suggestions for improvement [9] [10].

At the same time, students and instructors are encouraged to share their experiences and new knowledge gained from clinical work, academic conferences, and literature reading, as well as advanced nutritional treatment cases from home and abroad, to broaden the team's horizons, promote knowledge sharing, and cultivate innovative thinking.

4.3. Slide Show Creation and Presentation

Conduct regular nutrition education training sessions, with participants divided into groups to give 3 - 5 minute presentations and showcase their slideshows [11]. The content mainly includes basic nutritional knowledge, nutritional guidance for special populations, nutritional treatment for common diseases, analysis and discussion of typical cases, and summaries and insights from internships at various stages. Students and instructors listen together, and instructors score based on the content of the presentation, language expression, slide production, demeanor, and overall effect [12]. After all students have finished their speeches, the supervising

teacher will provide targeted feedback, acknowledging strengths, pointing out areas for improvement, and offering suggestions for future development.

4.4. Participate in New Media Promotion

In recent years, the Nutrition Department of the 989th Hospital of the Logistics Support Force has released a large number of public accounts and short videos through the Internet and new media channels. In the initial stage, interns will receive training in WeChat official account writing and short video production techniques [13], including excellent new media copywriting techniques and basic video shooting knowledge and techniques. During the practical phase, the supervising teacher determines the science popularization theme and content, and the intern writes the copy and shoots and edits the video. Finally, after approval by the department head, the content will be used for departmental new media promotion or submitted to provincial or municipal science popularization short video competitions.

4.5. Flexible and Individualized

Each intern has their own strengths and interests, and after completing the regular rotation internship, students are given some flexibility in their choices. After gaining a comprehensive understanding of the internship content and work processes of each group and mastering basic skills, interns can re-select their groups based on their career plans and interests to undergo 3 - 4 months of consolidation and in-depth learning to become specialized nutritionists.

4.6. Evaluation and Assessment Mechanism

Assessment and evaluation are crucial components of the internship training model. When it comes to training interns for medical nutrition professional positions, accurately evaluating students' abilities and conducting appropriate assessments and effective evaluations have become key to ensuring the quality of internship training [14].

Traditional written and oral examinations can assess students' theoretical knowledge, but it is difficult to evaluate their practical skills, ability to respond to unexpected situations, and ability to communicate with patients. In addition, contemporary college students suffer from significantly reduced strength and endurance due to prolonged sitting, late nights, psychological depression, and reduced exercise, resulting in generally poor physical fitness.

Therefore, in addition to conventional theoretical assessments, the internship program incorporates practical evaluations such as anthropometric measurements, nutritional screening and assessment, teamwork skills, communication and presentation abilities, case analysis, dietary guidance plan development, and professional ethics. Physical fitness assessments are also conducted, integrating the military-style management characteristics of military hospitals into the internship training to ensure a comprehensive evaluation of students' job competence

from multiple dimensions (**Table 2**). Regular assessments are conducted, immediate feedback on the results is provided after completion, strengths and weaknesses are identified, and suggestions for improvement are offered. Internship performance is included in students' academic records and serves as an important reference for evaluating excellence, recommending students for awards, and recommending them for employment. At the same time, based on the assessment results, instructors summarize their experiences and lessons learned from teaching internships, optimize teaching content and methods, and improve teaching quality.

Table 2. Multi-Dimensional assessment and evaluation of internship supervision.

Assessment format	Assessment items	Fraction proportion %	Assessment content
Theory-related examination	Clinical nutrition	25	Nutritional therapy for various diseases.
Skill operation	Physical measurement	10	Height, weight, waist circumference, hip circumference, upper arm circumference, skinfold thickness, etc.
	Preparation	10	Preparation and distribution of nutritional preparations.
	Screening and evaluation	10	Master the NRS2002 nutritional risk screening and SGA comprehensive nutritional assessment, and understand the three-level diagnosis of malnutrition.
	Propaganda of speech	10	PPT production, speech skills, clinical education times, etc.
	Diet plan formulation	15	Individualized energy and protein calculation, diet formulation, etc.
Professional development	Team cooperation	5	Carry out collective education and participate in meetings.
	Interpersonal communication	5	Communicate with doctors, nurses, patients, and their families.
	Professional quality	5	Whether absenteeism, lateness, early retirement phenomenon, and mental outlook.
	Physical fitness assessment	5	Morning exercises, standing military posture, 800-meter run, push-ups, pull-ups, internal affairs, and other military training projects.
Synthesis	Aggregate score	100 points	

5. Practical Effectiveness of the Mentoring Model

5.1. Multi-Dimensional Assessment and Evaluation of Internship Supervision

Over the past three years, we have accepted a total of 48 interns, all of whom are third-year students majoring in Medical Nutrition at Luoyang Vocational and Technical College. This includes 16 students from the Class of 2020, 14 from the Class of 2021, and 18 from the Class of 2022. The group comprises 7 male students and 41 female students, all of whom have achieved passing grades in all subjects during their first and second years of study. Under the new medical science perspective, through a clinical internship teaching model oriented towards job competency, we compared the average scores of three groups of interns before and after their internships using a multidimensional assessment (see **Table 2**). The interns showed significant improvement in all aspects of their abilities (**Table 3**).

Table 3. Comparison of multi-dimensional assessment results of three intern groups before and after mentoring.

grade	Average score of admission (points)	The average score (points)	upgrade rate
Grade 20 (16 people)	51.9	76.3	47.0%
Grade 21 (14 people)	53.5	89.1	66.5%
Grade 22 (18 people)	50.1	91.3	82.2%

5.2. Participating in Large-Scale Competitions and Publicity Activities

The 989th Hospital of the Logistics Support Force provides interns with opportunities to participate in various nutrition competitions and promotional activities. Every year, the Nutrition Department hosts the Luoyang Nutrition Society Health Science Popularization Competition, which brings together about 20 interns from hospitals across the city. The interns from our hospital's Nutrition Department performed outstandingly at this event, achieving excellent results. Compared with interns from other units in the same grade, 82% of them won third prize or higher.

5.3. Employment Rate and Satisfaction

Under the new medical paradigm, clinical internship instruction aligned with job competency requirements and market demands ensures the timely updating of teaching content [15]. According to the school's employment rate statistics, the high-quality employment rate of students in the last two years has increased by nearly 40%. According to a student satisfaction survey conducted by employers, satisfaction rates were as high as 95% or above. Practice has demonstrated that this mentoring model not only enhances students' job adaptability and career development potential, but also significantly boosts employment rates and satisfaction levels, thereby supplying more high-caliber, application-oriented talents to

various industries.

6. Conclusions

Clinical internships are a key component of training medical nutrition professionals and are of great significance in improving students' job competence. Under the new medical science perspective, the exploration of a competency-based teaching model emphasizes the cultivation of overall abilities, focusing not only on students' knowledge and skills, but also on the cultivation of comprehensive qualities such as practical abilities, teamwork abilities, communication abilities, and presentation abilities. Through diverse and flexible internship programs, students' professional identity in medical nutrition has been significantly enhanced. They are better able to adapt to future work environments and meet societal demands when faced with complex and ever-changing situations. It should be noted that the single-center design and relatively small sample size of this study may limit the generalizability of conclusions regarding the effectiveness of this teaching model to some extent.

Looking ahead, there is still considerable room for development in the clinical internship training model based on medical nutrition professional competency. Under the new medical science paradigm, with the advancement of technology and the transformation of the healthcare industry, the definition of professional competency will continue to evolve and improve [3]. Building on the achievements of this exploratory initiative, we will actively incorporate the latest industry concepts and technologies to further refine our mentoring system. We will continue to strive to cultivate medical nutrition professionals who are well-suited to the demands of the times and possess exceptional job competencies, thereby contributing to the vigorous development of the medical nutrition field.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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