

Expert System to assess the curricular proposal in the Dermatology subject for the training of General Doctor for the prevention of skin cancer

Summary

The WHO states that the incidence of skin cancer has tripled and priority should be given to promotion, prevention and control strategies, as well as education about risk factors. The university must respond to the needs of society and contribute to the solution of these problems. The objective is to elaborate and validate by System Experts a curricular proposal in the Dermatology subject for the training of General Doctor in the prevention of skin cancer.. The research was developed at the University of Medical Sciences of Cienfuegos and theoretical, empirical and mathematical methods were used.

The curricular proposal proposes a system of intentional, related, integrative and formative actions to develop and plan lines of action and methodologies that will be used to promote changes in the teaching-learning processes on the prevention of skin cancer in the subject of Dermatology for the training of the general practitioner The evaluation by experts of the curricular strategy allowed to confirm the feasibility, pertinence, relevance, sustainability and transferability, which informs of its theoretical, methodological and functional value as a guide for the treatment of the content of the prevention of skin cancer in the subject Dermatology in the training of the general practitioner.

Keywords: dermatological training, curricular strategy, methodological strategy, skin cancer prevention, delphi method, kendall's coefficient

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Development

This article presents the diagnosis object of the research: Dermatology subject in the curricular proposal for the prevention of skin cancer; The philosophical, psychological and didactic foundations are raised, the curricular proposal is presented to contribute to the prevention of skin cancer in the training of the general practitioner from the Dermatology subject and the methodological considerations of the curricular proposal for its application are raised.

For the diagnosis of the needs of the prevention of skin cancer in the dermatology subject, the documentation corresponding to the subject program and study plan of the medical career were reviewed, an interview was carried out with dermatologists and main professors of the provinces: Havana, Villa Clara, Santis Spíritus, Ciego de Ávila and Cienfuegos.

Analysis of the study plan of the medical career and the programs of the subject on the treatment of skin cancer prevention in the subject of dermatology.

According to the study plan and program of the Dermatology subject, it is received by students in the 5th, 9th and 10th semester for 3 weeks and shares space in the curriculum with other subjects such as English and Legal Medicine, within its content in the topic: Dermatoses of other origins the topic is included; nevus, tumors and precancerous lesions and within the educational organizational forms it is taught in a conference and a workshop class and has 9 hours of on-the-job education. The work scenarios of education at work are carried out from the hospital consultation, the visit pass in the hospitalization room and the specialized medical consultation of dermatology in the polyclinics of primary health care and the student does not have time to link the academic elements of the topic nevus tumors and precancerous lesions with the work developed in

the education at work because it is the last topic taught in the third week and in the same week the practical exam begins and the time dedicated to the topic is very short only 1 conference and a workshop class, as well as 9 hours of education at work, where the student is unable to integrate these academic elements from the community with patients at risk of skin cancer, but only assesses sick patients and preventive measures aimed at decrease the incidence of the disease from the basic prevention functions that must be performed by the general practitioner in his professional act. The content of skin cancer prevention is not established in other subjects of the study plan. There are no research projects declared by students in the dermatology course.

Documents aspects to analyze

Documentos	Aspectos a analizar
	Statement in the content programs related to the prevention of skin cancer in the study plan of the medical career.
Study plan of the Medicine career.	· Requirements to promote learning by students.
Study programs of the different disciplines and subjects..	· Proposed teaching methods.
	· Potentialities and limitations of the subjects to promote the treatment of content related to the prevention of skin cancer

Teacher interview and percentage analysis

In the diagnosis to support the strategy, the data obtained from the structured interview with professors, national directors of the dermatology program, head of the national cancer group and main professor of the subject in different provinces of the country was taken into consideration.

Question 1

Do you consider the relationship between academic, labor and research elements adequate for the prevention of skin cancer in the subject of dermatology?

72.7% of the teachers considered it moderately adequate.

Approaches:

The subject is taught does not present a seminar, only a workshop class.

No research project related to the subject is carried out. When students see patients with tumorous or precancerous lesions, emphasis is placed on their diagnosis and not on prevention.

Question 2

How is skin cancer treated in the dermatology course for its prevention from the community?

81.8% of the teachers claim to be treated moderately adequate.

Approaches:

The aspects on prevention of cutaneous cancer are used when giving the conference, the orientations from the theoretical.

The student is never directly linked in the community, the time is very short and since it is the last conference they do not have much time to link theory with practice.

In the consultations, diagnosis is greatly reinforced and not prevention, since it is an aspect of primary care and not of secondary where teaching is generally developed.

Question 3

How do you consider the characteristics of the dermatology curriculum in terms of the methodology used?

100% of the teachers considered it inappropriate.

Approaches:

Short time of the subject, in addition to coexisting in time with other subjects such as English and legal medicine.

Skin cancer must be taught between the first lectures, the student has a very short time when receiving the subject to identify precancerous and tumor lesions from the first week and reaffirm the knowledge obtained during the time that is taught in the subject, he does not achieve integrate the experiences of patients with the disease and the measures to be taken in the community for the prevention of skin cancer.

Cancer is not mentioned in other subjects related to prevention.

The realization of other academic activities as an integrating seminar is not oriented.

The most used means to teach the disease is the real patient that not always the student when he sees the patient with injuries, received

the content and emphasis is placed on diagnosing, it is not integrated as a biopsychosocial being where risk factors are paramount in the disease presentation.

100% of the teachers link the contents on skin cancer prevention empirically, guiding the student with patients from the secondary level of care or primary level in the polyclinic consultation.

Student survey and percentage analysis

A random sampling of proportions was carried out with $p = q$ (probability in favor equal to probability against) with a sampling error of 0.10, for a sample size of 21 students who were receiving the subject of dermatology and The survey was applied at the end of it.

Question 1

Do you consider the relationship between academic, labor and research elements appropriate for the prevention of skin cancer in the subject of dermatology?

68% of the students responded moderately adequate the close relationship between academics, work and research.

Approach:

The greatest weight of the subject is given to the academic aspect, conferences, seminars and workshop classes, however skin cancer and precancerous lesions are little addressed and it is also the last topic.

Education at work (Labor), despite being the fundamental activity, is left with a lot of time, due to the time of transfer to other educational institutions to receive academic activities.

The time devoted to skin cancer diseases is made primarily towards diagnosis and not prevention.

No investigative work is indicated where academic and labor elements can be consolidated as future professionals.

Question 2

How is skin cancer treated in the dermatology course for its prevention from the community?

80% of the students reported that the skin cancer prevention treatment was moderately adequate.

Approaches:

Very long topic and more emphasis is placed on diagnosing injuries, classifying and treating them and not on how to prevent them and some aspects about the damage caused by the sun and some measures to protect yourself are mentioned.

In practice, many patients are not observed to be able to identify them and risk factors, follow-up and behavior in the community are little mentioned.

There is not enough contact with patients at risk but with sick patients.

The subject is not given great importance during the course because it is the last, more educational activities are needed at work not only in the consultation but with patients in their community and it is a subject that has never been mentioned in previous years with importance for its prevention.

The lectures are very long with aspects of classification, clinical picture of many injuries and little is explained about the incidence and behavior in our country for which we do not give importance.

Question 3

How do you consider the Dermatology Curriculum, in terms of time, Objectives, forms, means and evaluation for the prevention of skin cancer?

100% of the students affirmed inappropriate.

Approaches:

The amount of topics taught in a very short time.

The topics are inadequately organized as cancer is the last conference and no other academic activity such as seminars is taught despite its importance in the community.

The way of imparting cancer is done from consultations in hospital care or polyclinics, and they are not familiar with the patient in the community.

Patients with the necessary pathologies do not always attend to be able to put the received knowledge into practice.

Curricular proposal in the subject of Dermatology for the prevention of cutaneous cancer in the Career of Medicine to validate by the Delphi method

In each aspect you must answer according to the following scale:

1. Very suitable
2. Fairly adequate
3. Adequate
4. Inadequate
5. Inappropriate.

Characteristic of the curricular proposal

A system of intentional, related, integrative and training actions to develop and plan the lines of action and methodologies that will be used to promote changes in the teaching-learning processes of the prevention of skin cancer in the subject of Dermatology for the training of the general practitioner in medicine.

General objective of the strategy

Structure the topic of skin cancer prevention in the dermatology subject for the training of general practitioners in medicine.

Elements that structure the strategy:

- Academic
- Labor
- Investigative
- Methodological

1-Academic:

It consists of the contents, expressed in knowledge, for the prevention of skin cancer in the subject of dermatology.

2-Labor:

It is constituted by education at work, whose main objective is to contribute to the formation of skills and practical habits that characterize the mode of action of the graduate of medical sciences. The student learns by working in the real context of professional work. The clinical method is practiced in a tutored way, which is the one that fosters in the student the formation of diagnostic and

treatment skills, where a total deployment of the teaching-learning process is carried out.

3-Investigative:

Design and execute a quality research project. developed and consolidated in the lines of research, the prevention of skin cancer directly related to the study plan of the subject of dermatology and skin cancer as health problems.

4- Methodological:

It is structured by the system of established methods, forms, means and evaluation.

Methods: Expository methods will be combined: joint development and independent work, the type of method will be selected based on the specific objectives of each topic, promoting the independent search of the student to solve the theoretical and practical situations that demand the conditions in which the study is developed. educational organizational form, promoting dialogue and reflection in the student's training process.

Topic I. Propedeutics and Therapeutics

A-Propedeutics: Skin phototypes

Aim:

Identify the different skin phototypes (FTC) to establish prevention behaviors for Skin Cancer (CC).

I- Academic Knowledge: Know - - - -

d) Explanation of the 6 skin phototypes in the patient

e) Differentiation of the individual characteristics of each of the skin phototypes

f) Analysis of the differences of the skin phototypes studied for photoprotection in the prevention of skin cancer.

II- Labor Skills: Know How

d. Determine the characteristics of the skin phototype in each patient and differentiate the characteristics of each FTC in patients.

F. Analyze the differences of the FTC in each patient for photo protection.

III- Values: Know How

g. Respect the individual characteristics of each patient

h. Esteem

i. Apply the principles of medical ethics

j. The honesty

k. Responsibility

l. Dedication to patients and their families.

B-Therapeutics: Sunscreens

Objective: Identify the different sunscreens for photo protection

Actions system:

I- Knowledge: Know

c) Explanation of the types of sunscreens

d) Differentiation of the individual characteristics of each of the protectors in the different skin phototypes

e) Analysis of the differences of the different photoprotectors studied for photoprotection.

Topic II: Dermatoses of other origins: Nevi, precancerous lesions and Skin cancer A-Precancerous lesions:

Actinic keratoses.

Objective: To identify actinic keratoses (AK) as the most frequent pre-cancerous lesion and expression of early skin damage for the prevention of skin cancer

Actions system:

I- Academic: Knowledge: know

1. Identify risk factors to integrate them with primary and secondary prevention measures

2. Specify aspects of the periodic self-examination of the skin

3. Determine the behavior to follow in the face of keratoses depending on their distribution, number and signs of transformation

4. Establish photo protection aspects.

II-Labor: Skills: Know How

c) Communication skills (student - patient, student - family) that allow them a correct questioning and diagnostic guidance.

d) Skills for the dermatological physical examination: Examination of the skin and mucous membranes

e) Communication skills (student - patient, student - family) that allow them a correct questioning and guidance with identification and diagnosis of risk factors and precancerous lesions.

III- Values: Know How

to. Respect the individual characteristics of each patient

b. Esteem

c. Apply the principles of medical ethics

d. The honesty

and. Responsibility

F. Dedication to patients and their families.

B-Skin cancer

Objective: To identify the risk factors for different skin tumors and the conduct to follow for their prevention from primary health care.

Actions system:

Academic: Knowledge

e) Identify risk factors and guide periodic self-examination of the skin

f) Explain the clinical signs that should attract attention when performing the skin self-examination

g) Explain the different risk areas for basal carcinoma and high risk factors and poor prognosis for squamous cell carcinoma and cutaneous melanoma

h) Establish aspects of photo protection for the prevention of skin cancer.

II-Labor: Skills: Know How

f) Communication skills (student - patient, student - family) that allow them a correct questioning and diagnostic guidance.

g) Skills for the dermatological physical examination: Examination of the skin and mucous membranes

h) Establish risk factors in each patient such as: skin phototype, presence of multiple nevi, APF of Skin Cancer.

i) Identify the presence of lesions with clinical signs suspicious of skin cancer

j) Determine the areas of high risk for the appearance of tumors, as well as the factors of poor prognosis.

3- Investigative

From the first day of class the Design guides the execution of a research project developed and consolidated in the lines of research on the prevention of skin cancer, directly related to the study plan of the subject of dermatology and skin cancer as a problem of health, using real patients as primary data in different work settings, assigning individuality and creativity to the student.

e) Demonstrate communication skills and dermatological physical examination

f) Identify skin phototypes, risk factors, clinical signs that should attract attention when performing the skin self-examination, different risk areas

g) Recognize the lesions of nevus, actinic keratoses, basal carcinoma, squamous cell carcinoma and cutaneous melanoma,

h) Establish aspects of photo protection for the prevention of skin cancer and guide the periodic self-examination of the skin.

4-Methodological

It is structured, by the system of established methods, forms, means and evaluation.

Methods: Expository methods, joint development and independent work will be combined, the type of method will be selected based on the specific objectives of each topic, promoting the independent search of the student to solve the theoretical and practical situations that demand the conditions in which the study is developed. educational organizational form, promoting dialogue and reflection in the student's training process.

Shapes. The established forms will be used depending on the objectives and the type of method used in the development of the content.

- Academic: Conferences, Workshop class, Practical class. Seminar
- Labor: Education at work, consultations, visit pass, doctor's office
- Investigative: Independent task based on research and the clinical method in different work settings with real patients from the consultation or other healthcare setting: hospitalized patients, patients in pediatric consultations, patients in dermatology consultation in primary health care and patients in the primary health care of the doctor's office.

Means: All the material resources that make it possible to objectify the content that is taught and learned, depending on the forms of teaching used in the training process: Real patients, television, computers, slides, medical records, dermatoscope, magnifying glasses, APP for cell phones on prevention of skin cancer, to give the student independence in a gradual and ascending way and develop in them logical thinking and creative and scientific research activity.

Assessment: It enables the fulfillment of the objectives in the training process, it must be flexible, inclusive and contextualized, which values the student's learning in the different scenarios in which they have received their training.

The role of the teacher in the methodological axis will be given by promoting the independent and reflective activity of the student in the combination of the different components that make up the theoretical and methodological development of the training of students in the prevention of skin cancer.¹⁻³

Delphi method

The Delphi Method is used in any research topic, as a way to validate the work carried out before a group of recognized experts. Its main characteristics are: Cortés & Iglesias⁴

- Anonymity.
- Feedback controlled by the researcher.
- Statistical group response.

According to Cortés & Iglesias,⁴ it defends the idea that critical analysis, in a group of experts, constitutes a fundamental instrument in the validation process of research.

As criteria for evaluating the result of this research, feasibility, relevance, sustainability and transferability were established; determined from the ideas of the authors, from the conceptions that have been used.

This method is used to validate the proposal "Dermatological training for the prevention of skin Cancer in the general practitioner".⁵⁻⁸

Stages and application of the Delphi method

1.- A set of 5 cut-off points or evaluation categories of the liker scale type is established: Very adequate, Fairly adequate, Adequate, Not very adequate and Inadequate.

2.- Selection of experts:

The experts were selected according to the established criteria, knowledge and argumentation: Hurtado de Mendoza,⁹

The list of expert candidates meeting predetermined requirements for experience, years of service, subject knowledge, etc. is drawn up.

Determination of the competence coefficient of each expert:

$C_{com} = \frac{1}{2} (C_c + C_a)$ the competence coefficient of each expert:

Where:

Cc: Knowledge Coefficient.

Ca: Coefficient of Argumentation.

The Competition:

Given the coefficients Cc and Ca, the value of the coefficient of competence Ccom is calculated for each expert following the following criteria:

Expert competence is HIGH if $C_{com} > 0.8$

Expert competence is MEDIUM if $0.5 < C_{com} \leq 0.8$

Expert competence is LOW if $C_{com} \leq 0.5$

(Cortés & Iglesias,⁴)

It was determined that, of the 13 selected experts, 10 had a high score in the Kcom proficiency coefficient, for 77% and 3 had a mean score for 23%. Of the experts, 5 (39%) presented a master's degree and 61% a second-degree specialist, 5 assistant professors (39%), 8 assistant professors (61%), with more than 10 publications and a graduate of more than 10 years 8 (61%), graduated between 5-10 years old 5 (39%). Publications 9 (69%) have more than 10 publications and 3 (21%) between 5-10 publications.

When evaluating the knowledge coefficient, the experts indicate that they are prepared in the topic of prevention for health 100%, when faced with the question related to knowledge about the prevention of skin cancer in the subject of Dermatology, they responded 100% to be well prepared, the preparation in the skin cancer topic of the dermatology course it was 100%, good and regarding the methodological preparation to integrate the academic work and research elements in a subject, only 5 (39%) responded that they were regularly prepared. In the same way, it behaved in relation to the knowledge about the structure of a curricular proposal in the subjects of higher medical education where 5 (39%) were moderately prepared.

The calculated Ccom coefficient of competence of the experts determined that the 13 selected experts had a high score in the competence coefficient.

3.- Analysis of the proposal by the experts.

Each expert was given a form with the aspects to be evaluated and the ranges for evaluation, which they can select to evaluate the proposal, the aspects to be evaluated by the experts are the following:

Elements that structure the strategy

- Academic
- Labor
- Investigative
- Methodological.

From the results of the previous analysis by the experts, construct the table of observed frequencies, in the table the number of experts who marked each of the valuation ranges is shown,

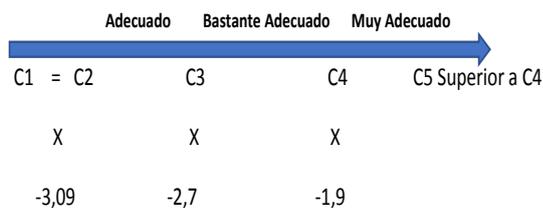
4.- The statistical tables are calculated:

- cumulative frequency table.
- relative cumulative frequency table
- accumulated inverse normal frequency table, this is the image for the normal distribution of each of the values in the previous table.
- calculation of the average by criteria see annex.
- calculation of the N-P table see annex
- calculation of the numerical ray which is nothing more than the calculation of the confidence intervals of the criteria previously established in the Likert scale, for the evaluation of the experts.

Expert judgment. Delphi results

Carrying out all the calculations corresponding to the Delphi method for the evaluation of the criteria, the following values of the cut-off points were reached:

Numerical ray



Cut points:

PC1: inadequate

PC2: unsuitable

PC3: suitable

PC4: quite adequate

PC5: very suitable.

The calculated N-P values have positive values falling in the range greater than C4 (-1.93), so the experts evaluate all the criteria of the proposal as Very Adequate.

Kendall's coefficient w

Calculation of Kendall's W Coefficient for the analysis of the concordance of the experts in relation to the Delphi results (SPSS 22):

The Kendall coefficient, obtained to calculate the agreement of the experts in the validation of the Delphi result of the present work, gives a TOTAL CONCORDANCE indicator equal to 0.928, corroborating the results obtained in the Numerical Ray:

All experts agree that the criteria given in the proposal are Very Adequate.¹⁰⁻¹⁹

Result

Curbelo M, Iglesias M, Cortés M in the publication "How to achieve the training of the general practitioner for the prevention of skin cancer" exposes the results of the strategy from the methodological component where the selected sample comprises 43 students of the Fifth year of Medicine of the universe of 247 for 13.5%, corresponding to the 2019-2020 School Year at the Faculty of Medical Sciences of Cienfuegos. The students were provided with timely information on the areas under investigation, offering them a didactic and illustrative manual that allows them to understand the aspects conceived in the identification of the different manifestations of skin cancer and their prevention from primary health care.

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The research is oriented to them from the first day of their rotation through Dermatology, which would be carried out in different teaching settings.

Observation guide, to demonstrate the student's professional performance in the labor component

Labor dimension	Good %	Regular %	Bad %
Observation of the skin	63	30	7
Skin phototype	74.4	25.5	0
Risk factor's	76.8	18.5	4.6
Melanocytic lesions	76.7	22.3	0
Pre-cancerous lesion	88.3	11.7	0
Skin tumors	69.7	13.9	4.6
Measures skin self Exam	79.0	31	0
Auto examen de la piel	67.4	23.2	9.3
Conduct and monitoring	74.4	23.2	2.3
Values	100	0	0

When applying the Observation Guide it can be observed: regarding the labor component:

than by observing the skin, 62.7% showed it to do well, In terms of the identification of skin phototypes, 32 students for 74.4%, In the identification of risk factors for skin cancer, 35, which represents 76.7, it was evaluated as good.

In the diagnosis and description of melanocytic nevus lesions, 33 are evaluated as Good for 76.7%,

Regarding the observation of precancerous lesions, 38 are evaluated as Good for 88.3 In the diagnosis of skin tumors, 30 students represented 69.7% Regarding the orientation of photoprotection measures for the prevention of skin cancer, 34 representing 79.0%, were evaluated as Good.

The self-examination of the skin was guided by 29 students for 67.4%, they are evaluated as Good, when observing the behavior and follow-up of the patient with malignant tumors, 32 for 74.4% are evaluated as Good, In compliance with the related values With ethics, responsibility, Honesty and dedication to patients and families, 100% of the students were evaluated as Good, when they managed to promote the determined values.

Observation guide, to demonstrate the student's professional performance in the investigative component

Research dimension	Good %	Regular	Bad
Ejecution	74.4	25.6	0
Elaboratio of the report	74.4	11.6	9.3
Methods used	74.4	25.6	0
Methods used	74.5	25.6	0

When evaluating student performance in presenting research related to skin Cancer prevention:

In the execution of the investigation, 32, representing 72.4%, were evaluated as Good and only 11 for 25.6% as Fair.

In the preparation of the report, 32 students 74% were evaluated as Good, 5 for 11.6% of Fair and 4 for 9.3% of Bad.

The presentation of the results with adequate means, 32 for 74.4% was done properly and 11 for 25.6% on a regular basis.

The results are presented with adequate methods by 32 students for 74.4% and 11 for 25.6% on a regular basis.

Conclusions

In the diagnosis of the Dermatology subject, little relationship is established between academic, labor and research in the Dermatology subject in relation to the topic of prevention of skin cancer, Academics are pointed out with greater emphasis, highlighting the importance of diagnosis and treatment of the disease and not in the prevention of it.

The training of the general practitioner requires an improvement related to the prevention of skin cancer, the theoretical references on this subject, confirm that the training of this professional requires an integration and systematization of the academic, labor and research components to act in the community on the prevention of skin cancer.

In the Dermatology curriculum, one of the proposed objectives is the preventive action of skin cancer, however, the organization of the topics, where the topic of skin cancer is the last topic taught, does not contribute to the training of students in the prevention of skin cancer.

The implementation of the curricular strategy in the Dermatology course for the training of general practitioners in the prevention of skin cancer shows how students manage to enrich their knowledge and skills by demonstrating the labor and research component. The observation of the skin and identification of lesions as well as the measures of photoprotection and orientation of the behavior in the patients, is evaluated well in more than 60 percent of the students.

The research carried out complements the student's skills by exposing satisfactory results in terms of execution, preparation, means and methods used, where the topic related to skin cancer in the community is deepened and updated.

The validation and application of the curricular strategy for the training of the general practitioner for the prevention of skin cancer, through the Delhi method and the results of the research methods used such as observation, show the transformation that can be achieved in the training of the physician general, for the prevention of skin cancer in the community. when the teaching, care and research components are integrated

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