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KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS MELANOMA IN PATIENTS WITH MELANOMA: A CORRELATIONAL STUDY

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Abstract

A correlational cross-sectional research design was conducted to examine the level of knowledge, attitudes, and practices (KAP) regarding melanoma in patients diagnosed with melanoma.The study aimed to assess the levels of knowledge, attitudes, and practices (KAP) regarding melanoma in patients diagnosed with melanoma. It was hypothesized that knowledge had significant positive correlation with attitude and protective practices, and demographic factors influence KAP levels. Sample size was calculated from Gpower, consisted of (N= 85) melanoma patients. Sampling technique used to recruit sample was non probability purposive sampling through dermatology and oncology departments of public and private hospitals of Lahore.Standardized KAP questionnaire was used to assess knowledge, attitude and practices. Structured information sheets were used to collect demographic and clinical data.Pearson product moment correlation was used to explore the relationships between knowledge, attitudes and practices. Hierarchical multiple regression was used to examine the predictive relationship of knowledge and attitude with practices and independent sample t-tests and ANOVA were used to evaluate differences across demographic groups.

The findings showed that knowledge and attitude and preventive practices were positively correlated. Those with greater knowledge about melanoma also demonstrated more positive attitudes and were more prone to act in a protective manner, such as skin self examination and sun protection. There was a significant negative correlation between age and knowledge, attitudes and practices, with older patients having lower levels of KAP. Knowledge and attitudes were important predictors of preventive practices. KAP levels were also significantly different across some of the selected demographic and clinical characteristics. The findings emphasize the significance of educational interventions and awareness programs aimed at enhancing patients' knowledge, positive attitudes, and preventive behaviors related to melanoma. These results have real implications for developing targeted health education strategies to improve early detection, prevention and self-management of melanoma in the Pakistani population.

Introduction

Squamous cell carcinoma, basal cell carcinoma, and malignant melanoma are the three primary forms of skin cancer, which are a significant issue with public health. The most prevalent types of skin cancer are SCC and BCC, while melanoma is less common but still the main cause of skin cancer-related death. Improving patient outcomes requires early diagnosis and treatment of all types of skin cancer. Those with lighter skin tones, those who use indoor tanning beds, and those with a history of sunburns or prior skin cancer

are more likely to develop skin cancer. Multiple nevi, a dysplastic nevus, and a family history of melanoma are specific risk factors for melanoma. Age also raises the risk of melanoma. The "ABCDE rule" is used in the clinical visual examination of the skin to assess skin infection (Baghani et al. 2024). The extensive use of lymph node biopsies, advances in systemic therapy, and a thorough grasp of the intricate biology have all significantly improved patient outcomes and survival.The formation and advancement of melanoma processes are crucial for improving patient care (Caraviello et al., 2025).

René Laennec coined the term "melanoma" in to characterize a case of the disease's metastatic spread. Melanocytes that produce pigment, undergo malignant changes that result in cutaneous melanoma (CM). Malignantly altered melanocytes in the genitalia, urinary system, gastrointestinal tract, uvea and meninges , etc are the source of non-cutaneous melanoma (Wu et al., 2025).People don't know about moles, how they develop naturally, or how to examine their own skin. Regular skin exams have been shown to increase survival rates. May is dedicated to raising awareness of melanoma (Mahmood et al., 2024).Melanocytes,cells that produce pigment found in the skin's basal layer, are the source of melanoma, a kind of skin cancer. It makes up 4–11% of all skin cancers and is the most deadly kind. 75–80% of skin cancer-related deaths globally are caused by it (Mahmood eta al., 2024). Superficial spreading, nodular, lentigo maligna, and acral lentiginous melanoma are the four main histological subtypes of melanoma, a extremely aggressive type of skin cancer. Its incidence has dramatically increased worldwide, with a reported increase of more than 60% between 1991 and 2011 (Wu et al., 2025).

One crucial technique for identifying potentially malignant lesions in moles is the ABCDE examination. It outlines five traits that a person can look for in a mole to either confirm or rule out melanoma (MacGill, 2025).

1. Asymmetric:One side of a cancerous mole is seem different from the other, but non-cancerous moles are often round and symmetrical.
2. Border:This could look jagged, notched, or blurry and is probably not smooth.
3. Color:Uneven hues and tones, such as red, black, brown, and tan, are common in melanoma s.They might even have blue or white pigmentati on.
4. Diameter:A mole's size may vary due to melanoma.For instance, a mole may be malignant if it grows greater than six millimeters.
5. Evolving:Skin cancer may be indicated by a mole's appearance changing over period of weeks or months.

Skin cancer is becoming more common all over the world,especially in the middle East , where i t is the most common cancer. Iran has a high pre valence of skin cancer due to its year-round high amounts of sunshine. (Baghani et al., 2024).

The previous couple decades, melanoma has become more common in developed nations with a high proportion of fair-skinned people.The 2020 worldwide data (GLOBOCAN) for incidence, death, and survival are used in our review.Melanoma of the skin accounts for 1.7% of all cancer diagnoses globally, with 325,000 additional cases expected in 2020, according to GLOBOCAN. An estimated 57,000 people died from melanoma in 2020, according to GLOBOCAN. The 5-year survival rate for melanoma rose from 81.9% in 1975 to 93.3% between 2011 and 2017, according to SEER. The 5-year survival rate for those with stage I–II disease is 99.4%; for stage III and stage IV, it falls to 68.0% and 29.8%, respectively. Only 4% of diagnoses are in stage IV, whilst 83% are in stages I–II (Saginala et al. 2021).

Melanoma is the third frequent type of skin cancer. The poor prognosis and early metastatic danger, it has a significant therapeutic impact.Melanoma skin cancer originates from skin melanocytes, which has a high potential for metastatic dissemination (Stephen et al., 2021). The following variables raise the risk of melanoma:Atypical naevi, melanoma, or skin cancer melanoma in the family, ultraviolet radiation,sun exposure, Red or light-colored hair, pale skin, high density freckles, light-colored eyes, Sunburn history, sun exposure or tanning beds, Large numbers of moles, ageing, immunosuppression, working outside, and

genetic abnormalities that raise the chance of developing skin cancer (Zehtab, 2023).

The three distinct but related components are often used to understand health behaviour. Knowledge means the awareness and understanding of a disease, including its causes, risk factors, symptoms and preventive measures. It provides you with the knowledge base for making wise health decisions. The attitude is the thoughts, perception and emotions of an individual regarding a disease and its prevention. This is a reflection of how people judge the importance or seriousness of the problem and their motivation to act on it.Practice refers to the real activities or behaviour of people, such as taking preventive measures or seeking medical attention (Launiala, 2009; Wu et al., 2025).

Knowledge refers to the participants' awareness and understanding of melanoma, including its causation, risk factors, symptoms, preventive measures and treatment options (Wu et al. 2025).Knowledge of melanoma is crucial for encouraging early detection and preventive action. Adequate knowledge includes risk factors such as exposure to ultraviolet (UV) radiation, warning signs such as changes in moles (ABCDE criteria), and knowledge of defensive actions. Studies have shown time and time again that people who are more aware are more likely to take preventative measures and seek timely medical attention, reducing the morbidity and death due to melanoma (Wu et al., 2025; Baghani et al., 2024). Lack of understanding and misconceptions about melanoma have led to poor health outcomes and delayed detection, especially in low and middle class areas where general awareness is low (Saginala et al., 2021).

Prognosis is closely link to the diagnosis,initial stage screening and detection of melanoma skin cancer are essential in decreasing morbidity and mortality. Melanoma is one of the few malignancies for which self-screening may be beneficial, since it can often be diagnosed at a beginning stage with dermatologic examination of the skin. In terms of suspicious moles and skin lesions, the ABCDE phenomenon (asymmetry, border irregularity, colour change, diameter greater than 6 mm and evolution of lesions) is often recommended. (Geller et al., 2002).Early detection is aided by clinical screening and self-examination. Skin self-examination (SSE) has been shown to increase the chance of detecting melanoma at an earlier and curable stage. Regular skin self-examinations can assure people to identify changes and seek prompt medical care (Kasparian et al., 2009).

Knowledge of melanoma prevention influences people's participation in protective health behaviours. The primary risk factor for melanoma, which is largely preventable, is exposure to artificial and solar ultraviolet (UV) radiation. Knowledge of prevention such as the value of sunscreens usage, protective clothes, using umbrella and avoiding maximum sun burn is adequate and reduces the risk of melanoma (World Health Organization, 2020)."People who know about sun protection are more likely to take preventative measures.Awareness of the adverse effects of UV radiation and the advantages of sunscreen with adequate sun protection factor (SPF) is correlated with improved use of sun-protective acts (Kasparian et al., 2009).The importance of avoiding indoor tanning has been highlighted as exposure to artificial UV radiation significantly increases the risk of melanoma, particularly in young adults (Guy et al., 2015).

Attitude refers to participants' beliefs, perceptions and feelings about melanoma and its prevention, including perceived susceptibility, seriousness and motivation to involve in protective behaviors (Wu et al. 2025).Melanoma patients view non-conventional therapies as an adjunct to conventional medical treatments, an alternative to inactivity, and a way to cope with feelings of pessimism. The importance of providing sufficient emotional support to patients, this does not lessen the necessity of informing them that unusual methods are ineffective (Sollner et al., 1997).

A skin type, family history, past sunburns, and level of information about skin cancer all influence their perceived risk. According to studies, those who are more aware of the melanoma risk factors, are more promptly adopt preventative behaviours and report feeling more susceptible (Davis et al., 2015).Together with perceived severity, perceived vulnerability creates

a projected threat that encourages behaviour modification. People are engage in early diagnosis and preventative measures when they feel that they are at risk (Carpenter, 2010; McWhirter & Hoffman-Goetz, 2015). The notion of melanoma's seriousness is reinforced by evidence showing survival rates drastically decline when the disease reaches advanced stages (Spanjaard et al., 2015). People are motivated to participate in preventative behaviours like sun protection, skin self-examination, and early screening when perceived severity and perceived susceptibility combine to create a perceived danger (El-Toukhy, 2015; Li et al., 2015).

Practice refers to the participants' actual behaviors and habits related to melanoma prevention and early detection, such as sun protection practices, self-skin examinations, and medical consultations (Wu et al. 2025).Melanoma practice refers to the real health-seeking and preventive actions people take to lower risk and encourage early detection.Research indicates that individuals who consistently engage in these protective behaviours are less prone to developing melanoma and more likely to detect suspicious lesions (Berwick et al., 2005; Wu et al., 2025).Research has shown that preventative behaviors often do not occur, even when individuals have adequate knowledge, because of perceived discomfort, low vulnerability, and lack of desire (Baghani et al., 2024).

The prevention of melanoma depends on minimizing exposure to ultraviolet (UV) radiation and improving early detection, which can greatly reduce morbidity and mortality. Key practices include sunscreen use, sun avoidance, skin self-examination, and timely consultation with a medical professional.One of the most commonly recommended methods of melanoma prevention is the regular use of sunscreen. Sunscreen locked the skin from the dangerous UV rays; regular use, especially of broad spectrum sunscreen with sufficient SPF, reduced risk of cancers (Micha et al., 2025; Lazovich et al., 2011). Preventive measure is to avoid long exposure to the sun, especially during the hours of maximum UV. Activity during the middle of the day can greatly reduce the risk of condition (Lazovich et al., 2011).Skin self-examination (SSE) can contribute to make diagnosis. People are advised to check their skin regularly for suspicious changes by such means as the ABCDE rule.Many melanomas are self-detected. Self skin examination can lead to earlier diagnosis and may reduce melanoma mortality (Coroiu et al., 2020; Hubbard et al., 2018). Early diagnosis and treatment are essential, and prompt medical attention for suspicious skin changes is necessary. People are encouraged to speak to a medical professional if they notice any changes in moles, lesions or unusual skin growths.Early medical evaluation improves survival outcomes (Hubbard et al., 2018; Coroiu et al., 2020).

Knowledge, attitude and practice (KAP) are interrelated components which, together, determine health behaviour. The KAP model suggests that knowledge is the foundation of a sequential relationship, influencing the attitudes of individuals, which then determine their practices or behaviours.Adequate knowledge about a disease, such as its causes, risks, and prevention, enhances awareness and understanding, which can lead to the development of positive attitudes, including perceived seriousness and motivation to engage in protective actions. These attitudes subsequently influence the adoption of appropriate health practices, such as preventive behaviors and timely healthcare seeking (Launiala, 2009; Wu et al., 2025). Empirical evidence supports this relationship, demonstrating significant positive correlation between knowledge and attitude, as well as between attitude and practice, particularly in studies related to melanoma and other health conditions (Baghani et al., 2024).

The relationship between knowledge, attitude, and practice (KAP) plays a critical role in determining preventive and early detection behaviors. Adequate knowledge about melanoma such as knowledge of risk variables (such as exposure to UV light), warning signs (e.g., changes in moles), and preventive measures forms the basis for developing positive attitudes toward the severity of the illness and the importance of protection. These attitudes, including perceived susceptibility and motivation to prevent melanoma, subsequently influence

individuals' practices, such as regular using sunscreen and dressing in protective clothes, and performing skin self-examinations (Wu et al., 2025; Baghani et al., 2024).

Empirical studies have demonstrated significant positive relation between knowledge and attitude, as well as between attitude and practice, indicating that individuals have higher knowledge levels typically result in more positive attitudes and better preventive actions. However, despite adequate knowledge, some individuals may still exhibit poor practices due to barriers such as lack of resources, cultural beliefs, or low perceived risk (Saginala et al., 2021).

Literature Review

This study was evaluating the knowledge, attitudes and behaviours (KAP) of melanoma patients and their families towards the disease. Cross-sectional survey in hospitals throughout the country. KAP scores and sociodemographic information were measured using administered questionnaires. Significant positive relationships between knowledge and practice and between knowledge and attitude were revealed by correlation studies.Additionally, a correlation between practice and attitude was discovered. According to the findings of structural equation modelling (SEM), practice and attitude were directly impacted by knowledge, while practice was impacted by attitude.Melanoma patients and their families have little knowledge about the disease, but they have optimistic attitudes and proactive behaviours (Wu et al. 2025).

In Cyprus, a Mediterranean island with a high ultraviolet (UV) index, it ranks tenth among women and eighth among males.Climate change is predicted to have a significant impact on Cyprus, and as a result, melanoma will probably become a more significant public health issue. It is feasible to prevent melanoma, however it is unclear how well-informed Cyprus residents are about the disease and how to avoid it. In order to assess the Cypriot population's understanding of melanoma and its contributing causes, we employed a validated survey.From October 2015 to April 2016, we administered a 47-item survey to 600 Cypriot citizens. District of residence and educational level were positively correlated with protective behaviour. Knowledge of melanoma was positively correlated with both district of residence and education level. Age and educational attainment were strongly correlated with level of concern.The research population's knowledge and preventative behaviours regarding melanoma are lacking. Teenagers and those with lesser levels of education should get specialized information on melanoma and its prevention so that protective behaviours are developed early in life (Kyprianou et al., 2022).

The study is to assessed public knowledge of melanoma and skin self-examination (SSE) among patients attending Lahore General Hospital, Pakistan. Results demonstrated a substantial knowledge gap with 81% of participants unaware of melanoma and 70% of respondents reporting that they had not examined their skin. More than half of the respondents said they had moles, but the majority were not worried about it and had not seen a doctor. There was also little knowledge about the severity of melanoma or its ability to metastasize. Many participants, however, identified benefits of regular skin examinations and self-examination for early detection and improved survival. The study points out considerable deficiencies in melanoma awareness and preventive practices and calls for public education programs to promote early detection and timely healthcare-seeking behaviour (Mahmood et al., 2024).

This study examined knowledge, attitudes, and practices regarding skin cancer among the general public and healthcare professionals in Lahore, Pakistan. Results indicated greater knowledge of skin cancer among males and more positive attitudes and preventive practices among females. Younger people were more aware and more likely to engage in skin cancer prevention behaviours. Higher educational attainment and occupational status were also significantly associated with better knowledge and practices. Doctors were more effective than nurses and chemists in identifying common skin cancer symptoms and stressing the importance of routine screening among health care professionals. The study reports demographic and professional differences in skin cancer awareness, indicating the need for targeted public health campaigns and specialized

educational programs to promote effective prevention, early detection, and uniform skin cancer management practices (Aslam et al., 2024).

2.1. Rationale

Melanoma is the dangerous types of skin cancer,becoming more common cancer worldwide.Early detection and appropriate preventive behaviors are crucial for improving survival rates. Despite advancements in diagnosis and treatment, patient outcomes remain closely linked to individual knowledge, attitudes and practice towards melanoma.Limited knowledge about melanoma risk factors, preventive measures and self-examination techniques in Pakistan and other South Asian regions.Assessing the knowledge, attitude, and practice (KAP) among melanoma patients is useful in identifying gaps that may impede prevention and early diagnosis and in guiding targeted educational and behavioral interventions. The present study aims to explore these dimensions for better health literacy and preventive care.

2.2. Objectives

1. To assess the level of knowledge, attitudes and practices related to melanoma in patients diagnosed with melanoma, and to explore their associations with demographic and clinical characteristics.
2. To examine patients' attitudes toward melanoma prevention, early diagnosis, and self-care practices.
3. To evaluate the sun protection and self-examination practices adopted by melanoma patients in their daily lives.

2.3. Hypotheses

1. There will be a significant positive relationship between knowledge and sun protection practices among melanoma patients.
2. Higher knowledge levels will be associated with more favourable attitudes toward melanoma prevention and self examination.
3. Demographic factors including age, gender, education level, family history etc will significantly predict KAP levels.

2.6. Conceptual Model

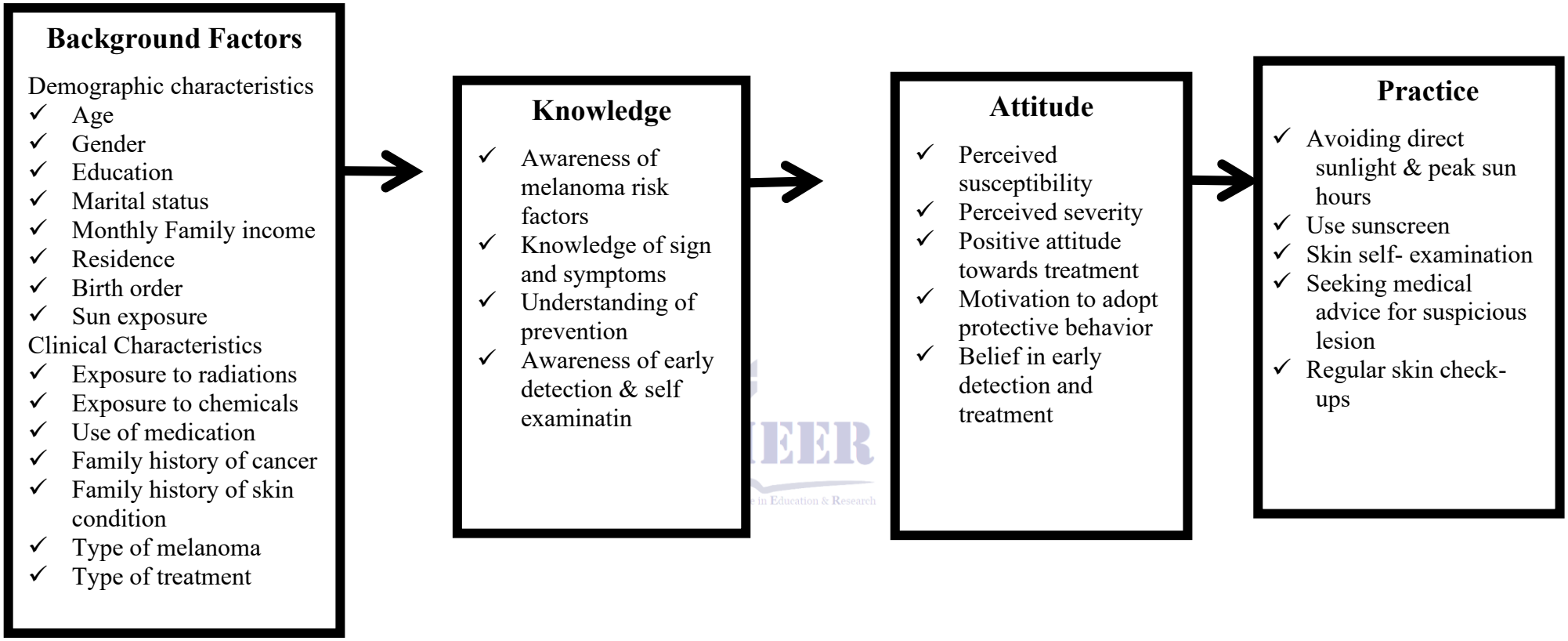

Figure 3.1. Conceptual Model of Knowledge, Attitude and Practice(KAP)

Method

3.1. Research Design

A correlational cross-sectional research design was used to assess the level of knowledge, attitudes and practices related to melanoma in patients diagnosed with melanoma, and to examined their associations with demographic and clinical characteristics.

3.2. Sample and Sampling Strategy

Non-probability purposive sampling technique was used to recruit the sample. The sample comprised of 85 patients with melanoma as estimated by **GPower. Participants were recruited as referrals from oncology and plastic surgery departments or OPD of public and private hospitals in Lahore.**

3.2.1. Inclusion Criteria

1. Participants who were clinically diagnosed melanoma at least 6 months ago.
2. Participants who were on clinical follow ups at public and private hospitals.
3. Participants who were provide informed consent to participate in the study.
4. Both in-ward and OPD patients were included.

3.2.2. Exclusion Criteria

1. Participants who were diagnosed with the other chronic conditions (psoriasis, eczema, acne, vitiligo, lupus etc).
2. Participants who had coexisting chronic physical illness (diabetes, hypertension, arthritis etc).
3. Participants who had any co existing malignancy(Breast cancer, abdominal cancer, cervical cancer etc).
4. Participants who had diagnosed cognitive impairment or severe mental health conditions, such as psychosis or suicidal ideation.
5. Participants with no formal education were excluded.

3.3. Operational Definitions

3.3.1. Melanoma

The term "melanoma" describes a malignant tumour that develops from melanocytes, the skin's pigment-producing cells. It is characterized by abnormal and uncontrolled proliferation of melanocytes, which can invade surrounding tissues and metastasize to other organs if not detected early (Garbe et al., 2022).

3.3.2. Knowledge

Knowledge refers to the participants' understanding and awareness of melanoma, including its causes, risk factors, symptoms, preventive measures, and treatment options. Knowledge will be measured through questionnaire items adapted from (Wu et al. 2025).

3.3.3. Attitude

Attitude denotes the participants' beliefs, perceptions, and feelings toward melanoma and its prevention, including perceived susceptibility, seriousness, and motivation to engage in protective behaviors (Wu et al. 2025).

3.3.4. Practice

Practice refers to the participants' actual behaviors and habits related to melanoma prevention and early detection, such as sun protection practices, self-skin examinations, and medical consultations (Wu et al. 2025).

3.4. Assessment Measures

3.4.1. Demographic Information Sheet

The Demographic Information Sheet assessed participants' sociodemographic characteristics including age, gender, birth order,educational level, marital status, family system, residence, family background, occupation, and monthly family income. It also explored lifestyle and environment exposure variables such as sun exposure habits, duration and timing of exposure, smoking and alcohol consumption, and physical traits like eye color and skin type.

3.4.2. Clinical Information Sheet

The Clinical Information Sheet gathered information related to melanoma-specific clinical variables, such as age at diagnosis, frequency of sunburn exposure per year, history of radiation or chemical exposure, comorbid skin or systemic conditions, family history of malignancy, and type and treatment type of melanoma.These measures provided a comprehensive profile of each participants' demographic, behavioral and clinical characteristics, allowing for correlation and regression analyses within the knowledge, attitude and practice(KAP) framework toward melanoma.

3.4.3. Knowledge, Attitude, and Practice (KAP) questionnaire

The final questionnaire had four aspects for gathering data, and it was administered in Chinese. Included were basic personal details such as age, gender, education level, and current job position (Wu et al., 2025).

There were twelve items in the knowledge dimension, seven in the attitude dimension, and

six in the practice dimension. The response options were used to determine the scores for statistical analysis. The knowledge dimension yielded a score range of 0–24 points, with correct answers earning 2 points and ambiguous or erroneous answers earning 0 (e.g., excessive ultraviolet light can raise the risk of melanoma, and melanoma does not metastasize).

A five-point Likert scale with a score range of seven to thirty-five points, ranging from extremely positive (five points) to extremely negative (one point), was used to gauge the attitude dimension (e.g., I recommend regular skin self-examination to patients and am concerned about melanoma recurrence).

Similarly, a five-point Likert scale with a score range of six to thirty points was used to measure the practice component. In each section, scores of at least 70% of the maximum possible were considered indicative of sufficient knowledge, a positive attitude, and proactive behaviour. This criterion was selected using established techniques from earlier KAP research, such as studies that evaluated healthcare workers' knowledge and attitudes using similar criteria10.

The questionnaire was developed after a review of the literature on health-related KAP models and knowledge and behaviour unique to melanoma (for example, I will go to the hospital for regular follow-ups on time as prescribed by the doctor, and I will alter my lifestyle based on the doctor's advise, etc.).

3.5. Procedure

The study was follow a systematic procedure to ensure ethical considerations throughout the research process. Ethical approval was obtained before data collection. Approval from the original authors were sought for the use of existing KAP scales related to melanoma. After receiving all approvals, questionnaire was translated in urdu, translating the questionnaire helped participants clearly understand each question and respond accurately, reducing the risk of misinterpretation.To enhance the reliability and validity of the instrument, a pilot study were conducted before the main study with a limited sample of participants.

The permission letters were signed from different hospitals. Data collection was subsequently conducted in oncology and plastic surgery department and out-patient department of both public and private hospitals in Lahore, Pakistan. Participants were recruited through purposive sampling based on inclusion criteria and willing to participate voluntarily.

Before participating, each patient was explained for the purpose, procedures, possible dangers, and advantages of the study. Confidentiality was upheld and written informed consent was obtained.

To ensure the authenticity and credibility of the collected sample, Reference contact details and data verification report of the patients were documented and provided to the research supervisor for confirmation purposes only. The supervisor cross-checked selected cases from the sample verification report and reference contacts. All questionnaires were securely stored and only available to the principle researcher. After completion of data collection, completeness of the responses was examined, coded, and entered into statistical software for analysis.

3.6. Ethical Consideration

The current study will be carried out in compliance with the ethical principles of the American Psychological Association (APA).

1. Participants were informed about the goal of the study and given an information booklet and consent form.
2. Information about the participants was kept private and anonymous.
3. Participants might leave the research at any time without incurring any penalties.
4. The researchers refrained from evaluating the conduct, reactions, or disposition of the individuals.

Results

The findings of comprehensive statistical analysis assess the levels of knowledge, attitudes, and practices (KAP) regarding melanoma in patients diagnosed with melanoma. A summary of the sample characteristics was provided through psychometric analyses of the measurement scales, which served as the foundation for the study. The

internal consistencies of the scales, confirming the reliability of the knowledge, attitude and practice. To determine the mean differences of two groups and two or more groups independent sample t test and one-way Anova were run. To explore correlation between variables,Pearson product-moment correlation analysis was conducted.A linear regression analysis was run to determine to which extent the knowledge, attitude predicting the practice in patients with melanoma.

Table 4.1

Descriptive and Psychometric Properties of Knowledge, Attitude and Practice (N=85)

				Range			
Scales	*k*	M	*SD*	*Minimum*	*Maximum*	*Cronbach's a*	*Skewness*
Knowledge	12	7.094	2.437	2.00	12.00	.834	-.188
Attitude	7	24.54	6.77	9.00	35.00	.896	-.620
Practice	6	19.96	6.87	6.00	30.00	.803	-.464

Note: M=Mean, SD=Standard Deviation, a = alpha

Table 4.1 present the internal Consistency of the scales.The knowledge scale consists of 12 items with dichotomous scale (Correct/Incorrect) showed good reliability with cronbach's α =.834, Attitude scale consists of 7 items with 5 point likert scale showed good reliability with cronbach's α =.896 indicating acceptable consistency among attitude items.Practice scale consists of 6 items with 5 point likert scale showed good reliability with cronbach's α =.803 indicating that practice items reliably assessed the participant's preventive practice.

The skewness value for all variable were in the acceptable range (+1) showed that data were approximately normally distributed and suitable for further psychometric analyses.

Table 4.2

Mean,Standard Deviation and t-values for Sun Exposure on Knowledge, Attitude and Practice in Patients with Melanoma (N = 85)

	Yes		No				
Variables	M	*SD*	M	*SD*	*t(85)*	*p*	*Cohen's d*
Knowledge	7.130	2.484	6.937	2.294	.284	.777	0.08
Attitude	24.59	6.739	24.31	7.152	.149	.882	0.04
Practice	19.88	6.856	20.317	7.143	-.223	.824	0.06

Note: M = Mean, SD = Standard deviation, *p ≤ .05 level; **p ≤ .01 level; ***p ≤ .001 level

Table 4.2 revealed that participants with sun exposure reported slightly higher mean scores in knowledge and attitude compared to participants without sun exposure, . In contrast, participants without sun exposure demonstrated marginally higher practice scores than those with sun exposure .The differences were not statistically significant for knowledge,attitude, and practice, all p-value were greater than .05The effect sizes were negligible (Cohen's d = 0.04–0.08), indicating minimal differences in KAP regarding melanoma skin cancer based on sun exposure status.

Table 4.3

Mean,Standard Deviation and t-values for Family History of Cancer on Knowledge, Attitude and Practice in Patients with Melanoma (N = 85)

	Yes		No				
Variables	*M*	*SD*	*M*	*SD*	*t(85)*	*p*	*Cohen's d*
Knowledge	6.547	2.451	7.627	2.330	-2.083	.040	0.45
Attitude	23.42	6.896	25.62	6.553	-1.507	.136	0.33
Practice	19.64	6.987	20.27	6.821	-.425	.672	0.10

Note: M = Mean, SD = Standard deviation, *p ≤.05 level; **p ≤ .01 level; ***p ≤ .001 level

Table 4.3 demonstrated that individuals with a family history of cancer, those without such a history reported higher mean scores in knowledge, attitude, and practice. Only knowledge showed a statistically significant difference, meaning that individuals without a family history of cancer knew a great deal more about melanoma skin cancer. Cohen's d = 0.45 indicated a moderate effect size for knowledge. For attitude and practice, the differences were not statistically significant; all p-values were larger than.05, and the effect sizes were tiny (Cohen's d = 0.10–0.33).

Table 4.4

One-way ANOVA for Exposure to Radiation (Sunlight,Medical Radiation, Occupational Radiation and No Significant Exposure)

	Sunlight		Medical Radiation		Occupational Radiation		No Significant Exposure				
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	η^2	*p*
Knowledge	7.03	2.59	6.66	2.52	7.43	1.62	7.80	.447	.225	1.04	.879
Attitude	12.1	7.02	23.6	7.09	25.7	5.46	29.6	2.61	1.11	0.04	.346
Practice	19.8	7.02	16.3	6.42	20.8	7.24	22.4	4.83	.525	0.02	.666

Note: M = Mean, SD = Standard deviation, *p ≤ .05 level; **p ≤ .01 level; ***p ≤ .001 level

Table 4.4 showed that Knowledge, Attitude, and Practice scores varied across different types of radiation exposure; however, these differences were not statistically significant. In knowledge, participants with no significant exposure reported slightly higher mean scores, followed by occupational radiation, sunlight exposure , and medical radiation exposure.In attitude, higher scores were observed among participants with no significant exposure and occupational radiation exposure compared to medical radiation and sunlight exposure. The practice scores were relatively higher in the no significant exposure group and occupational radiation group compared to sunlight and medical radiation. Slight variations were observed across exposure groups, none of the differences reached statistical significance, all p-value were greater than .05 indicating that type of radiation exposure had no meaningful effect on KAP regarding melanoma skin cancer.

Table 4.5

One-way ANOVA for Exposure to Chemicals (Hair Dye, Fragrances,Beauty Products, Makeup Products,Pesticides, Home Cleaning Agent, Not Significant and Other)

	Hair Dye		Fragrances		Beauty Products		Makeup Products		Pesticides		Home Cleaning Agent		No Significant		Other				
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	η^2	*p*
Knowledge	5.31	2.49	8.15	1.77	5.00	.000	6.82	1.99	5.00	2.64	7.88	2.08	6.64	2.46	8.20	2.37	3.176	0.22	.005
Attitude	21.3	7.86	27.1	5.20	16.5	16.5	23.9	6.77	20.0	10.5	25.7	5.99	22.9	7.50	27.4	4.90	2.142	0.16	.049
Practice	17.8	6.87	22.2	6.02	10.0	.000	18.8	5.99	15.3	11.4	20.8	6.97	18.5	7.90	22.8	5.33	1.965	0.15	.071

Note: M = Mean, SD = Standard deviation, *p ≤ .05 level; **p ≤ .01 level; ***p ≤ .001 level

Table 4.5 revealed that Knowledge, Attitude, and Practice scores varied across different types of chemical exposure, with some statistically significant differences observed. In knowledge, participants exposed to "Other" chemicals and fragrances showed higher mean scores, while lower scores were observed among users of hair dye, beauty products, and pesticides, with a statistically significant. The attitude scores were highest among the "Other" category and fragrances, while lower scores were seen in beauty products and pesticides, with a significant group difference. For practice, higher scores were observed in "Other"and home cleaning agents , whereas lower scores appeared in beauty products and pesticides ,the difference did not reach statistical significance. The chemical exposure type showed a significant influence on knowledge and attitude, while its effect on practice was not statistically significant.

Table 4.6

Pearson Product Moment Correlation on study variable (N=85)

Variables	*Age*	*Knowledge*	*Attitude*	*Practice*
Age		-.493**	-.556**	-.500**
Knowledge			.801**	.745**
Attitude				.898**
Practice				

Note:*p< .05; **p< .01; ***p<.001

Table 4.6 shows that age was significantly and negatively associated with knowledge, attitude, and practice, indicating that as participants' age increased, their levels of knowledge, positive attitudes, and preventive practices related to melanoma tended to decrease. In contrast, knowledge demonstrated a significant positive relationship with both attitude and practice, suggesting that participants with greater knowledge were more likely to have favorable attitudes and engage in better practices. Furthermore, attitude was positively associated with practice, indicating that more positive attitudes toward melanoma were linked with better preventive and health-related behaviors. Overall, the findings suggest that knowledge, attitude, and practice are closely interconnected, while increasing age may be associated with lower levels of these variables.

Table 4.7

Hierarchical Multiple Regression for Predicting Practices in Patients with Melanoma (N=85)

Variables	*B*	*SE*	*B*	*t*	*p*	R^2	ΔR^2
Model 1						.381***	.381***
(Constant)	34.737	5.443		6.382	.000		
Age	-.409	.066	-.591	-6.231	.000		
Gender	-.883	1.288	-.064	-.685	.495		
Current level of education	-2.619	1.048	-.256	-2.499	.015		
Monthly family income	2.448	.819	.298	2.988	.004		
Family history of cancer	-.468	1.283	-.034	-.365	.716		
Family history of skin condition	2.377	1.486	.162	1.599	.114		
Model 2						.829***	.829***
(Constant)	.953	3.757		.254	.801		
Age	-.020	.045	-.029	-.452	.653		
Gender	-.638	.687	-.047	-.928	.356		
Current level of education	.065	.589	.006	.111	.912		
Monthly family income	.597	.457	.073	1.305	.196		
Family history of cancer	-1.649	.694	-.121	-2.376	.020		
Family history of skin condition	-.081	.810	-.006	-.100	.921		
Knowledge sum	.223	.229	.079	.975	.332		
Attitude sum	.839	.087	.827	9.628	.000		

Note: SE=Std. Error , *B*=Beta , ; *p ≤ .05 level; **p ≤ .01level; ***p ≤ 0.01

Table 4.7 presents the results of the hierarchical multiple regression analysis predicting melanoma-related practices among patients. In the first model, age, educational level, and monthly family income emerged as significant predictors of practices, whereas gender, family history of cancer, and family history of skin conditions were not significant contributors. After adding knowledge and attitude in the second model, the explanatory power of the model increased substantially. In this final model, attitude emerged as the strongest positive predictor of practices, indicating that patients with more positive attitudes were more likely to engage in better melanoma-related practices. Family history of cancer also showed a significant association with practices, while age, gender, education, monthly family income, family history of skin conditions, and knowledge were no longer significant predictors.

Discussion

The present study was conducted to examine the knowledge, attitude and practice (KAP) towards melanoma among patients of melanoma. Different procedures of statistical analysis were performed using Statistical Packages for Social

Sciences software. Analyses were conducted to test the hypothesis of some additional findings.

The findings supported the first hypothesis that knowledge was positively correlated with melanoma preventive practices. Participants who were aware of melanoma and its risk factors had relatively better preventive behaviours, including sun protection and self-care practices. These findings are consistent with previous international studies that found sufficient knowledge to play a key role in encouraging protective practices against skin cancer (Wu et al., 2025; Heckman et al., 2021).

Similarly, Mahmood et al. (2024) awareness about melanoma and self-skin examination improved preventive behaviours among the Pakistani population. The present findings also support the Health Belief Model that awareness and perceived susceptibility motivate people to take health-protective actions.

The second hypothesis was that greater knowledge would be associated with more favourable attitudes toward melanoma prevention and self-examination. This hypothesis was partially supported by the results of the study, as participants with relatively higher knowledge levels showed positive attitudes towards melanoma prevention. These results are consistent with the findings of Baghani et al. (2024) who reported positive correlation between knowledge and attitude regarding prevention of skin cancer.

Cercato et al. (2015) observed that those with higher knowledge of sun exposure and sunscreen use had more favourable attitudes toward preventive behaviours. The current findings suggest that increasing educational awareness may help individuals to develop healthier beliefs and attitudes to melanoma screening and prevention.

The third hypothesis was partially supported with regard to demographic variables. The study revealed that some demographic factors like birth order, family history of cancer and chemical exposure had significant association with KAP dimensions, while variables like gender, residence, occupation, education and marital status did not significantly affect KAP scores. These findings are in partial agreement with previous studies that demonstrated demographic factors may affect melanoma awareness and preventive behaviours .

The current study also showed significant differences in knowledge and attitudes towards melanoma between participants exposed to certain chemicals. The KAP scores were relatively higher in participants exposed to fragrances and other chemicals than those exposed to pesticides or beauty products. These results might point to the fact that occupational and environmental experiences affect how individuals perceive skin health risks.

Strashilov and Yordanov (2021) have previously pointed out environmental and chemical factors in the development of melanoma and emphasised the need for preventive education on exposure to carcinogens. Thus, raising awareness about hazardous environmental exposures may lead to better preventive behaviours in high-risk groups.

Zafar et al. (2022) reported similar finding in Pakistan who observed that better knowledge on ultraviolet radiation exposure was associated with more positive attitudes and protective practices among university students. Similarly, Aslam et al. (2024) found that individuals with higher awareness of skin cancer had better attitudes toward prevention and early detection.

The present findings are consistent with the indigenous literature on health behaviour, particularly in KAP (Knowledge, Attitude, Practice) frameworks as applied to Pakistan and similar contexts. The strong negative association between age and knowledge, attitude and practice is consistent with studies which found that younger people tend to have better awareness and more proactive health behaviours, possibly due to greater exposure to digital health information and education campaigns.Similar patterns have been seen in dermatological and cancer related studies where increasing age was associated with reduced preventive behaviours and lower screening awareness. On the other hand, the strong positive correlations observed between knowledge, attitude and practice support the well-established KAP model which postulates that better knowledge leads to positive attitudes and, consequently, to healthier practices. Research on indigenous people in South Asia has found that

people with more knowledge of disease are more likely to adopt preventive behaviours, especially in terms of skin cancer awareness and sun protection practices (Khan et al., 2021; Ahmed & Raza, 2022).

The regression results also reveal attitude as the strongest predictor of practice. This is supported by regional evidence suggesting that behavioural change is more strongly driven by perception and belief systems than by knowledge alone. Studies in Pakistani health care settings have shown that even when patients have adequate knowledge, their ability to put this into practice depends largely on their attitudes toward the seriousness of the disease, their perceived susceptibility, and their motivation for self-care (Ali et al., 2020; Javed & Hussain, 2023).

The finding that the effect of socio-demographic factors like gender, education and income was rendered non-significant after the inclusion of psychological variables suggests that cognitive and attitudinal factors may mediate the effect of background characteristics on health behaviour. This is in agreement with local studies noting that attitude is a major determinant in influencing preventive practices in chronic disease settings including cancer preventive practices (Shah et al., 2022).

In general, results corroborate the importance of promoting attitudinal changes with targeted health education programs for the improvement of melanoma-related prevention practices in the indigenous population.

The current study contributes to the growing body of knowledge, attitude and practice literature of Pakistani patients with melanoma. Results suggest the need for structured awareness programs, patient education and early screening interventions to promote preventive behaviours for melanoma.

Educational campaigns encouraging the use of sunscreen, self-skin examination, and early identification of suspicious lesions may help reduce delayed diagnosis and improve health outcomes. Consistent with previous literature (Caraviello et al., 2025), the study underscores the importance of improving public awareness and preventive strategies for the effective management of melanoma and the reduction of disease burden.

5.1. Limitations and Suggestions

1. The cross-sectional design of this study made it impossible to establish causal links between knowledge, attitude, and practice. Longitudinal or experimental research should be conducted in the future to gain a deeper understanding of causal effects.
2. The results' generalisability was limited by the small sample size and the fact that participants were only chosen from particular hospitals. Larger, more varied samples from other regions of Pakistan should be used in subsequent studies.
3. Moderate knowledge and positive attitudes were observed, but preventive practices regarding melanoma were relatively low. Awareness campaigns and health education programs related to sunscreen use, sun protection, and self-skin examination are needed.
4. Limited indigenous literature concerning knowledge, attitude and practices related to melanoma restricted wider comparison of results in the Pakistani context. There is a need for more local research to bolster evidence-based interventions and policies.
5. Healthcare professionals should provide structured counseling and educational materials to melanoma patients and their families on early detection, preventive behaviors and regular screening practices.

5.2. Implications

1. The study emphasizes the importance of increasing awareness about melanoma, its risk factors and preventive behaviors in patients and the general population.
2. The results corroborate the necessity of education and awareness efforts on the usage of sunscreen, sun protection, and self-skin examination for melanoma early diagnosis.
3. The results can be used by healthcare professionals such as oncologists and psychologists to guide patient-centered counseling and psychoeducational interventions for melanoma patients.

4. The study establishes the groundwork for further research in this field and contributes to the scant indigenous literature on melanoma-related knowledge, attitudes, and behaviours in Pakistan.
5. The findings will be useful to public health authorities and policymakers to design preventive programs and screening strategies to reduce delayed diagnosis and improve melanoma-related health outcomes.

5.3. Conclusion

This study aimed to assess the knowledge, attitudes and practices regarding melanoma in patients diagnosed with melanoma. Results revealed that participants had moderate knowledge and positive attitudes towards melanoma prevention. But the preventive measures were still relatively less adequate. Knowledge, attitude and preventive practices were significantly and positively correlated, suggesting that the greater the health promoting behaviors, the greater the level of awareness. Demographic and clinical factors had also partial effect on KAP dimensions.The study highlights the need for awareness raising, preventive behaviors and strengthening educational interventions on melanoma. By increasing public awareness and encouraging early screening and self-examination, early detection, better treatment outcomes and a reduced burden of melanoma can be achieved in Pakistan.

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