Assessment of Mothers and their Children' Knowledge and Practice Regarding Precautionary Measures to prevent Warts' Recurrence

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Abstract

Background: Warts are one of the most chronic and frustrating skin and mucosal conditions encountered in dermatology clinics especially among children. Pediatric nurses play a key role in assessment, engaging and empowering mothers and children about warts. **Aim**: The current study aimed to assess mothers and their children' knowledge and practice regarding precautionary measures to prevent warts recurrence. **Design**: descriptive research design was used. **Setting:** Outpatient clinic at Dermatology Department of Tanta University Hospital. **Subjects:** All mothers accompanied with their children (100) during the last six months were included. **T**wo tools were used to collect the required data. **Tool I**: Mothers and Children' Knowledge Regarding Warts, **Tool II:** Mothers and Children's Reported Practice Regarding Warts Precautionary Measures. **Results:** All of children (100%) had low level of total knowledge about warts, nearly two thirds of mothers and more than two thirds of children had unsatisfactory practice regarding warts precautionary measures. **Conclusion:** The majority of studied mothers and all of studied children had low level of knowledge regarding warts. Highly positive significant correlations between mothers and children total knowledge and their total preventive practices of warts. **Recommendations:** Develop an awareness program for mothers and children about warts precautionary measures and use interactive and engaging teaching methods to educate children about warts.

Key words: Children, Knowledge, Mothers, Practice, Precautionary measures, warts recurrence

Introduction

Warts represent one of the most common skin diseases, affecting about 7 to 10 percent of the world population. Warts can affect people of any age, but are most common in children aged between 12 – 16 years old. Warts are often caus ed by Human papilloma virus (HPV). It is one of the most common infections in the world, infecting about 40 percent of the population. **(Teka et al., 2021)**.

Epidemiological data on the prevalence of cutaneous warts in Egypt especially in children are limited. Available studies are conducted in selected child groups mostly from dermatology clinics or small urban areas in Lower Egypt cities. A recent study reported percentage between 7%- 13% of children and adolescents are infected by viral warts. **(Abdulsalam, Nofal, & El-Ghareeb, 2022)**.

A study reported a prevalence rate of warts about 7.4% among primary school children in Bab El-Shaareya region, Cairo city, and another one was conducted in rural Lower Egypt with a reported prevalence rate of 2.3% in the hands only **(Kasim, Amer, Mosaad, Abdel-Wahed, & Allam, 2013)**.

The prevalence of warts was 10.3% among primary school children in Tema, a mixed rural-urban area of Upper Egypt. Common wart was the most prevalent type, and the hand was the most affected site. Significant predictors were big family size and sharing shoes with other family members. Other significant associated factors included living in rural areas, attending public schools, illiterate parents, fathers with manual work, and swimming in water canals **(Essa, Saleh, Mostafa, Taha, & Ismail, 2019)**

There are several factors that thought to play a role in the progression of HPV infection. It includes individual susceptibility, immune status, nutrition, endogenous and exogenous hormones. Other factors include tobacco smoking, parity, co-infection with other sexually transmitted agents such as HIV, herpes simplex virus type 2, and Chlamydia trachomatis as well as viral characteristics such as HPV type, concomitant infection with other types, viral load, HPV variant, and viral integration **(Tota et al., 2022)**.

There are various types of warts, these include the common wart, flat wart, plantar wart, filiform wart, periungual wart, mosaic wart, and genital wart. Each type of wart has specific characteristics that distinguish them from the other types **(Jain, Behere, Patil, & Karnavat, 2021)**.

Common warts (verruca vulgaris) Common warts are typically well circumscribed exophytic papules with a rough, often hyperkeratotic, surface. They usually occur on hands, knees, elbows and sites of trauma. Filiform variants with frond-like projections usually occur around the mouth or lips **(Iryani, Djawad, Wahab, & Tabri, 2019)**.

Common warts occur most frequently on the dorsal aspect of the hands (favoring the fingers and periungual region) and on the palms. They occur anywhere on the body and on mucosal surfaces. Typically, it begins as discrete, pinpoint, flesh-colored papules. Over weeks to months, they enlarge into yellow, black, or brown papules with a rough papillomatous surface. Common warts range from a single lesion to multiple lesions **(KWAN, 2022)**.

Cryotherapy is considered second line treatment following failed topical therapy. Cryosurgery is a method of selectively destroying unwanted tissue using cold liquids or gasses. It causes maximum tissue destruction in the target lesion with minimal collateral damage to the surrounding healthy structures. Cryosurgery does not kill the human papilloma virus (HPV); in fact, viruses can survive and be preserved in liquid nitrogen **(Chat et al., 2022)**.

Liquid nitrogen is applied using a spray or cotton-tipped sticks. Regular application at three-weekly intervals over 12 weeks induces cure in 60-80 per cent of children. The wart is frozen until a ‘halo’ forms around the circumference and the freeze is maintained for 5- 30 seconds, depending on the site and thickness of the wart. Two freeze-thaw cycles are recommended for hyperkeratotic lesions **(Shim et al., 2021)**.

Most warts go away without any significant problems. Sometimes warts are linked to several different cancers, including anal, cervical, oropharyngeal cancer and disfigurement may occur**.** Children with weakened immune systems may develop unappealing clusters of warts on the hands, face and body. **(Yarbrough & Simpson, 2019)**.

Pediatric nurses play a key role in building health literacy with mothers and children.

They must involve, engage with, and empower mothers and children to learn more about warts. They have crucial role to prevent and mange warts infection for children and help them to access health services and gain advice. **(Ayatollahi et al., 2022)**.

Pediatric nurses should inform mothers and children about precautions that can help prevent warts. Human papillomavirus (HPV). They must be aware that warts spread easily from person to person, and it's found everywhere. For these reasons, it can be difficult to prevent warts completely. Informing children and their mothers taking some precautions, may help to reduce the risk of child getting warts **(Townsend & Bartlett, 2020)**.

It's important for pediatric nurse to provide mothers and children with knowledge about warts. Warts are caused by infection with the human papillomavirus. The virus thrives in warm, moist environments like shower stalls or locker rooms, so it can be transmitted indirectly from one person to another. It takes between one and eight months for a wart to appear after the virus has entered a person's body through a break in the skin **(Tubaş, Dulkadir, Taplak, & Ünlü, 2022)**.

Significance of the study:

Warts are the most common, persistent, and frustrating cutaneous problems encountered in dermatology clinic especially in school age children. Generally, they have a higher prevalence among children aged 5 –10 years and young adults. The prevalence has been estimated to be 5–30% in school age children. Common wart was the most common type among children (49.0%) of all cases followed by plantar and plane warts (24.1% for each) while genital wart was the least one (2.8%). **(Biederman et al ,2021)** Warts can sometimes have cosmetic disfigurement and effect on the psychological condition of the child if cover a large area of the body Also, it have an adverse impact on day-to-day life. Plantar warts can be painful if they rub on shoes or are on weight-bearing areas and, when on the sole of the foot, can even affect walking if they are extensive. So, assessment of mothers and their children' knowledge and practice regarding precautionary measures used to prevent spread of warts is very important and crucial for pediatric nurses to minimize infections **(Biederman etal ,2021& Burman etal,2020)**

Aim of the Study:

The present study was aimed to assess mothers and their children knowledge and practice regarding precautionary measures to prevent warts recurrence.

Subjects and Method

Study design: descriptive study design was used in the current study.

Setting: The study was conducted at Outpatient Clinic of Dermatology department of Tanta Main University Hospital, confined to the Ministry of Higher Education Scientific Research.

Subjects: A purposive sampling of 100 children with warts who fulfill the inclusion criteria and their mothers (100) was recruited in the current study. The total number of children with warts is 500 child / year in 2021. The sample size was calculated using Epi- info software statistical package. The sample size was calculated based on type 1 error 0.05 and confidence level 95%.

Tools of data collection:

Two tools were used to collect the data in current study as follow:

Tool (I): Mothers and Children' Knowledge Regarding Warts:

A Questionnaire sheet was developed by the researcher to obtain socio-demographic data of children and their mothers as well as mothers and children's knowledge regarding warts, it comprised of three parts:

Part (1): **Socio-demographic characteristics of children:** including age, sex, level of education, and child's order in the family.

Part (2): Socio-demographic characteristics of mothers: it includes mother's age educational level, occupation, number of family members, housing condition and residence.

Part (3) Mothers' and Children's Knowledge regarding warts:

It was designed by the researcher after reviewing the related literatures **(El Attar, A., et.al. 2022) Tengku Jamaluddin, T. Z. M., et.al., 2020).** It was designed in multiple choice question, it was composed of 14 questions for children and 14 questions for mothers that cover all the knowledge, it included the following items:

a- For mother : items related to warts such as meaning , diagnosis, onset, source of infection, manifestations, causes, mode of transmission, duration of illness, classifications, medical history, previous infection of family members, recurrence, prevention, precautionary measures and treatment.

b- For children : items related to warts such as meaning , diagnosis, onset, source of infection , manifestations, causes, mode of transmission, duration of illness, site, classification, medical history, previous infection of family members, recurrence, prevention, precautionary measures & treatment.

The total score of mothers and children's knowledge was calculated and classified into the following:

–Poor Knowledge Less than 50%.

–Fair knowledge from 50 < 70%.

–Good knowledge from 70 - 100%.

This sheet was filled in the clinical area using structured interview with the studied children and their mothers.

Tool (II): Mothers and Children's Reported Practice Regarding Warts Precautionary Measures:

This tool was developed by the researcher to collect data related to reported practice of mothers and their children, regarding warts precautionary measures. It included the following practices:

a. Mothers' Reported Practice Regarding Warts Precautionary Measures:

- Hand washing (10) items.
- Allocating personal equipment (5) items.
- Skin care (8) items.
- Precautionary measures during touch warts (3) items.

b. Children's Reported Practice Regarding Warts Precautionary Measures:

- Hand washing (10) items.
- Using personal equipment (4) items.
- Caring of skin such (6)items

Total score of mothers & children's practice was classified into:

- Unsatisfactory practice less than 65%.
- Satisfactory practice equal or more than 65%.

Method

- **Administrative process**: An official permission was obtained from the Dean of the Faculty of Nursing, Tanta University and submitted to the administrator of Dermatology Department of Tanta University Hospital, after clarifying the purpose of the study to obtain approval and cooperation for carrying out this study.
- **Ethical and legal considerations:-**

a. Ethical approval was obtained from the Faculty of Nursing Scientific Research Ethical Committee before conducting the study (code No. : 9-11-21).

b. Informed consent was obtained from mothers and their children after explaining the aim of the study. Mothers and children had the right to withdraw from the study at any time without giving any reason.

c. Mothers were assured that data obtained was confidential and used only for the purpose of the study.

d. Nature of the study didn't cause any harm or pain to the entire sample.

- **Content validity**: Face validity of the tools were calculated based on 5 experts in Pediatric Nursing opinion, it was 94%.
- **A pilot study:** was conducted on 10% of study sample (10) children and (10) mothers to test the tool for its clarity, applicability, feasibility and the necessary modifications were done.
- **Reliability of developed tool** Cronbach's Alpha was used to test reliability of the tools. It was 0.787 for knowledge tool (I) and 0.771 for practice tool (II).
- **Tools development:** two tools were developed **by** the researcher in the current study, Mothers and Children' Knowledge Regarding Warts tool (I). Mothers & Children's Reported Practice Regarding Warts Precautionary Measures Tool (II).
- **The actual phase of study :**

It was carried out by the researcher to identify children who meets the inclusion criteria and to assess mothers and their children's knowledge and practice regarding precautionary measures to prevent warts' recurrence at the study setting.

Children & their mothers' approval for participation were obtained after explaining the aim of the study. The researcher interviewed mothers and their children's in waiting room during follow up. The researcher was available in the previous setting at morning shift, three days per a week on Saturday, Tuesday and Thursday.

Mother and their children socio-demographic characteristics were assessed using tool (I) part 1 & 2. Mothers' and children's knowledge regarding warts was assessed individually using structured interview schedule. Each interview last for 20 minutes. Mothers and children's knowledge was assessed by using (tool I part 3)

The researcher assess children's reported practice regarding hand washing technique, using personal equipment, caring of skin and avoidance of touching warts . Mothers reported practice regarding hand washing technique, avoid touching child's warts, personalize child's equipment, cleaning and covering child's cuts and scrapes, keep child's skin clean and dry and using protective measures when touching warts were also assessed using (tool II)

The questions were directed in a simple Arabic language. Answers were recorded immediately by the researcher. Data was collected over a period of 6 months starting from the beginning of May 2022 to the end of October 2022.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version 26. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison was done using Chi-square test (χ^2).\Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient r. A significance was adopted at ($P<0.05$) for interpretation of results of tests of significance. Also, a highly statistical significance was adopted at ($P <0.001$).

Results:

Table (1): Shows percentage distribution of studied children according to their socio-demographic characteristics. It was observed that more than one third (36.%) of the studied children their age ranged between 10-12 years old and nearly one third of them (33%) their age ranged between 8 to less than 10 years old with mean age of (**8.62±1.847**) years. Concerning sex, it was observed that more than half of the children (56%) were female, and all of them (100%) were in basic education. As regards children's order in family it was found that nearly equal percentage (36% and 37%) of the children

were first and second child in the family respectively**.**

Table (2) shows the percentage distribution of the studied children according to their medical history, It was observed that most of children (83%) hadn't previous history of warts ,and all of them (100%)hadn't history of other diseases. As regards family history of warts ,it was found that only 18% of them had history of warts , Equal percentage (27.8%)of mothers and fathers were exposed to warts.

Table (3): Shows percentage distribution of studied mothers according to socio-demographic characteristics. It was observed that 40% of the studied mothers their age ranged between 30<35 years and only 3% of them their age ranged between 45-50 years with mean age of (**34.16±4.944**). Regarding educational level, it was found that 65% of mothers had secondary education, and that 80 % of them didn't work. Nearly three Quarters of the mother (77%) were from rural areas. As regards housing condition it was found that 61% of studied mothers lives in house with 3 rooms and one bathroom, while only 1%of them lives in one room and shared bathroom

Table (4): Shows percentage distribution of studied mothers according to their knowledge about warts. It was observed that about more than half (58%) of studied mothers had incomplete answer about meaning of warts and about two thirds (68%) reported incomplete answer about diagnosis. Almost all of studied mothers (99%) had incorrect answer about onset of the symptoms. On the other hand more than two thirds (71%) of studied mothers had complete answer regarding warts infectious ability.

Table (5): illustrates percentage distribution of studied children according to their knowledge about warts. It was observed that nearly three quarters of the children (74%) had incorrect answer regarding meaning of warts, and 66% of them had incorrect answer about diagnosis of warts .

Most of children (99%) had incorrect answer about onset of the symptoms, 90% of them didn't know source of infection and warts infectious ability, and 95% had incorrect answer about causes and types of warts. It was found that all of studied children (100%) had low level of total knowledge about warts.

Table (6): shows percentage distribution of children according to their total practice of wart's preventive measures. It was observed that 61 % of studied mothers had unsatisfactory practice while 39 % of them has satisfactory practice regarding warts preventing measures

Table (7): shows total practice of studied children regarding warts preventive measures, It was observed that 69% of studied children had unsatisfactory practice while 31% had satisfactory practice regarding warts preventing measures .

Table (8): clarifies correlation between mothers' total knowledge and their reported practice. There was highly positive significant correlations between mothers' total knowledge and hand washing where (p = 0.000), and between mothers' total knowledge and allocating personal equipment for child where (p = 0.000). High statistical significant positive correlations were also found between mothers' total knowledge & Clean child's skin where (p = 0.000), and between mothers' total knowledge and precautionary measures during touch warts (p = 0.000). High statistical positive correlations between mothers' total knowledge and mothers' total practice was found (P=0.000).

Table (9): clarifies correlations between children's total knowledge and their reported practice .There was highly statistically significant positive correlations between children's total knowledge and hand washing where (p = 0.000), and between children's total knowledge and skin care where (p = 0.000). It was obvious that there was positive

significant correlation between children's total knowledge and sharing personal equipment where (p=0.026). There was highly statistical positive correlations between children's total knowledge and children's total practice where (P=0.000).

Figure (1): clarifies percentage distribution of mothers according to their knowledge regarding warts. It was clear that the most of the mothers (92%) had low level of knowledge regarding warts.

Figure (2): presents ranking of mothers reported practice domain of precautionary measures to prevent warts recurrence. It was clear that more than three quarters of the mothers (67.6%) clean child's skin, followed by hand washing 61.5%, precautionary measures during touch warts 57.3% and the least practice was allocating personal equipment (41.2%).

Figure (3): demonstrate ranking of children reported practice domains on prevention of warts recurrence , It was observed that sharing personal equipment was reported by 68%of the children , followed by hand washing 58.5% , and the least practice was (42%)for skin care .

Table (1): Percentage Distribution of the Studied Children according to their Socio–Demographic Characteristics.

Children characteristics	The studied children (n=100)	
	No	%
Age (in years)		
- 6-<8	31	31
- 8-<10	33	33
- 10-12	36	36
Range	**(6-12)**	
Mean ± SD	**8.62±1.847**	
Sex		
- Male	44	44
- Female	56	56
Educational level		
- Basic education	100	100
Child's order in family		
- First	36	36
- Second	37	37
- Third	23	23
- Last	4	4

Table (2): Percentage Distribution of the Studied Children according to their Clinical History.

Children clinical history	The studied children (n=100)	
	No	%
Previous exposed to warts		
- None	83	83.0
- Once	17	17.0
Children history of other diseases		
- No	100	100.0
Family history of warts		
- Yes	**18**	**18.0**
- No	82	82.0
Family member exposed to warts	**(n=18)**	
- Father	5	27.8
- Mother	5	27.8
- Brother	3	16.7
- Sister	4	22.2
- Grand-mother	1	5.5

Table (3): Percentage Distribution of the Studied Mothers according to their Socio–Demographic Characteristics.

Mothers' characteristics	The studied mothers (n=100)	
	No	%
Age (in years)		
- 25<30	17	17.0
- 30<35	40	40.0
- 35<40	29	29.0
- 40<45	11	11.0
- 45-50	3	3.0
Mean ± SD	**34.16± 4.944**	
Educational level		
- Basic education	11	11.0
- Secondary school	65	65.0
- University	24	24.0
Occupation		
- Work	20	20.0
- Not work	80	80.0
Residence		
- Rural	77	77.0
- Urban	23	23.0
Family members number		
- 3<5	29	29.0
- 5<7	69	69.0
- More than or equal 7	2	2.0
Housing condition		
- Room and shared bathroom	1	1.0
- Room and private bathroom	2	2.0
- Two rooms and bathroom	36	36.0
- Three rooms and bathroom	61	61.0

Table (4): Percentage Distribution of Studied Mothers Knowledge about Warts .

Mothers' knowledge about warts	The studied mothers (n=100)					
	Incorrect/ Don't know		Incomplete answer		Complete answer	
	No	%	No	%	No	%
Meaning	27	27.0	58	58.0	15	15.0
Diagnosis	14	14.0	68	68.0	18	18.0
Onset of symptoms	99	99.0	1	1.0	0	0.0
Warts infectious ability	27	27.0	2	2.0	71	71.0
Source of infection	86	86.0	14	14.0	0	0.0
Causes	76	76.0	21	21.0	3	3.0
Manifestations	8	8.0	74	74.0	18	18.0
Modes of the infection transmission	34	34.0	62	62.0	4	4.0
Duration of illness	98	98.0	2	2.0	0	0.0
Sites of warts	4	4.0	96	96.0	0	0.0
Types of warts	86	86.0	14	14.0	0	0.0
Ways to prevent infection	29	29.0	38	38.0	33	33.0
Precautions to prevent warts' recurrence	30	30.0	43	43.0	27	27.0
Treatment of warts	8	8.0	80	80.0	12	12.0

Table (5): Percentage Distribution of Studied Children Knowledge about Warts .

Children's' knowledge about warts	The studied children (n=100)					
	Incorrect/ Don't know		Incomplete answer		Complete answer	
	No	%	No	%	N	%
Meaning	74	74.0	23	23.0	3	3.0
Diagnosis	66	66.0	33	33.0	1	1.0
Onset of symptoms	99	99.0	0	0.0	1	1.0
Warts' infectious ability	90	90.0	10	10.0	0	0.0
Source of infection	90	90.0	10	10.0	0	0.0
Causes	95	95.0	5	5.0	0	0.0
Manifestations	54	54.0	46	46.0	0	0.0
Modes of the infection transmission	61	61.0	39	39.0	0	0.0
Duration of illness	98	98.0	1	1.0	1	1.0
Sites affected with warts	10	10.0	90	90.0	0	0.0
Type of warts	95	95.0	4	4.0	1	1.0
Ways to prevent infection	50	50.0	35	35.0	15	15.0
Precautions to prevent recurrence	50	50.0	50	50.0	0	0.0
Treatment of warts	59	59.0	41	41.0	0	0.0

Total level of knowledge	The studied children (n=100)	
	N	%
Low	100	100.0

Table (6): Percentage Distribution of Studied Mothers Reported Practice towards Warts Preventive Measures.

Mothers' total practice level	The studied mothers (n=100)	
	No	%
– Unsatisfactory	61	61.0
– Satisfactory	39	39.0

Table (7): Total Practice of the Studied Children Regarding Warts Preventive Measures.

Children total practice level	The studied children (n=100)	
	N	%
– Unsatisfactory	69	69.0
– Satisfactory	31	31.0

Table (8): Correlation between Mothers' Total Knowledge & their Reported Practice Regarding Warts.

Practice domains	The studied mothers (n=100) Total knowledge score	
	r	P
1. Hand washing	**0.439**	**0.000****
2. Allocating personal equipment for child	**0.672**	**0.000****
3. Clean child skin	**0.548**	**0.000****
4. Precautionary measures during touch warts	**0.648**	**0.000****
Total practice score	**0.705**	**0.000****

* Significant at level P<0.05 .
** Highly significant at level P<0.01.

Table (9) Correlation between Children's Total Knowledge Score Regarding Warts and their Practice Regarding Prevention of Warts.

Practice domains	The studied children (n=100) Total knowledge score	
	r	P
1. Hand washing	**0.346**	**0.000****
2. Sharing personal equipment	**0.223**	**0.026***
3. Skin care	**0.448**	**0.000****
Total practice score	**0.447**	**0.000****

* Significant at level P<0.05.

** Highly significant at level P<0.01

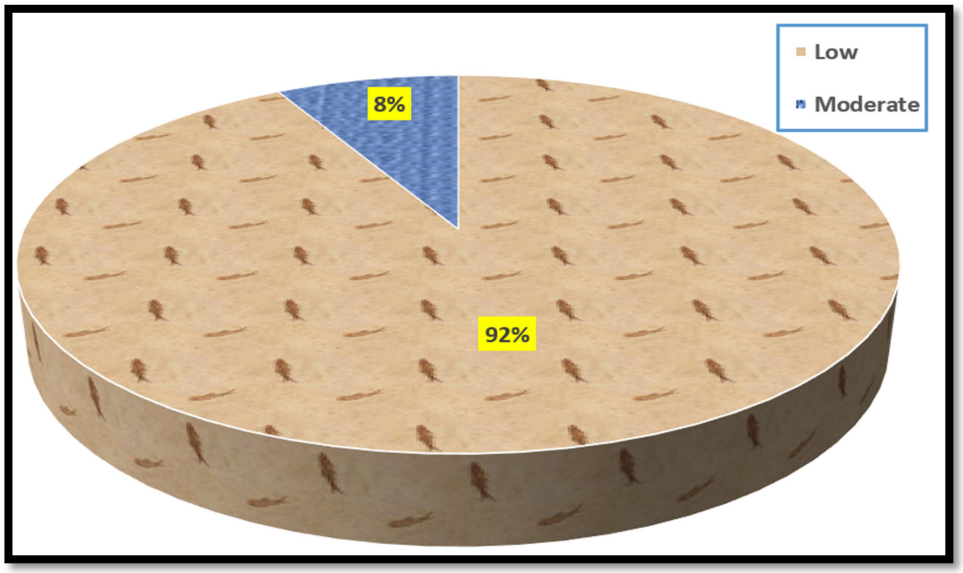

Figure (1): Percent distribution of mothers according to their knowledge regarding warts

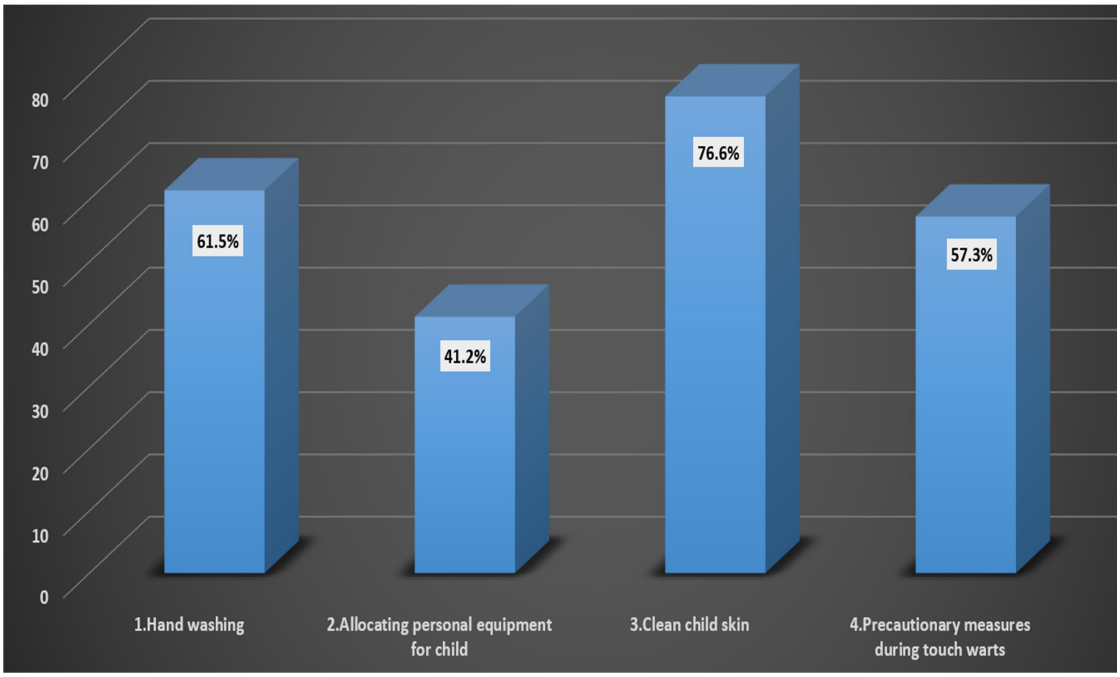

Figure (2): Ranking of practice domains of mothers towards preventive measures to prevent the recurrence of warts

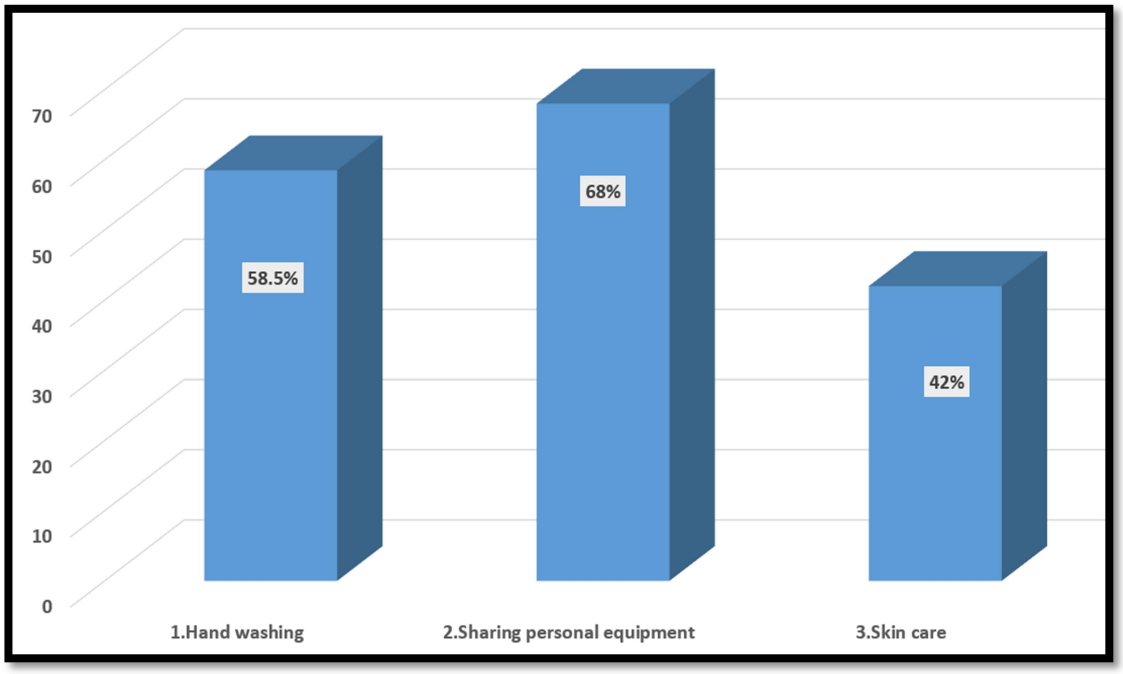

Figure (3): Ranking of practice domains of children towards prevention the recurrence of warts

Discussion

Warts are superficial viral infections of the skin that are extremely common in children. The infection usually lasts more than 1 year and can be moderately contagious in specific settings; for instance, warts are particularly common and spread more easily **(El Attar et al., 2022)**. Common warts were the most common type, and the hand was the most affected site. Significant predictors were big family size and sharing shoes with other family members. Other significant associated factors included living in rural areas, belonging to public **(Essa et al., 2019).**

As regarding the studied children's clinical history, the current study showed that most of children didn't had previous history of wart, and all of them hadn't history of other diseases. It was also found that only less than one fifth of children's family had history of warts and more than one quarter of mothers and fathers were exposed to warts.

These results were in agreement with **El-Gilany, (2022)** who studied "Non-genital warts among primary school students in Bilkas District, Egypt: prevalence and associated factors" and found that the minority of students reported that their warts are recurrent, more than half of them had warts of <8 months duration, more than one third of them received medical treatment, and less than half of warts were plantar and were in the sole.

Regarding the studied mothers' knowledge about warts, the present study showed that about more than half of studied mothers had incomplete answer about definition of warts. Concerning the diagnosis, about two thirds of the studied mothers gave incomplete answer and the vast majority of the studied mothers had incorrect answer in relation to onset of the symptoms .On the other hand

about more than two thirds of them had complete answer regarding warts infectious ability. Also, most of studied mothers had incorrect answer about source of infection and types of warts, More than two quarters of them had incorrect answer about causes of warts and the vast majority didn't know duration of illness.

These results may be due to lack of specified educational program provided to mothers regarding warts and its precautionary measures. On the same line, **Nguyen Minh et al., (2020)** a performed study entitled "Effectiveness of a health talk education program on Human Papillomavirus (HPV) knowledge, attitudes, and intentions to vaccinate children among mothers of secondary school boys in Thua Thien Hue Province, Vietnam" showed that more than three quarters of the studied sample had reported incorrect answers about most items related to Human Papillomavirus (warts).

The present study results showed that most of the studied mothers had low level of knowledge. This finding may be attributed that nearly two thirds of the studied mothers had secondary education and low level of information and in needing to educational and awareness programs and also may be related to their residence as less than three quarters of mothers lived in rural areas that may affect accessing to health services and lack of follow up due to distance from health care facilities. This result was in the same direction with **Kılıçaslan et al., (2022)** who studied "The level of knowledge about Human Papillomavirus Infection and vaccination among mothers of children aged 11-18 years of age" in Turkey & **El Attar et al., (2022)** who studied "Mothers' knowledge, practice and attitude regarding warts in children". They stated more than three fifths of the studied mothers had average total knowledge level about warts, less than one quarters of them had poor total knowledge and one sixth of them had good knowledge level about warts disease in children.

Children's knowledge about warts, in the present study illustrated that about three quarters of the studied children had incorrect answer regarding meaning of warts, and more than two thirds of them had incorrect answer about diagnosis of warts. Most of the children had incorrect answer about onset of the symptoms, and the majority of them didn't know source of infection, causes and types of warts. All the studied children had low level of total knowledge about warts

From the researcher point of view, these results may be due to that most of the studied children were younger age and all of them were in the basic education and lived in rural area. So, it is difficult to gain knowledge about their disease if they didn't receive direct and specific educational program about warts precautionary measures.

A study conducted by , **Kılıçaslan et al., (2022)** was in agreement with the current findings. They clarified that more than two thirds of the children reported incorrect response to definition, causes, types and management of warts (HPV) infection and vaccination. Also, these results were in the same direction with **Salaam et al., (2023)** who conducted a study entitled "Incidence of cutaneous warts: A retrospective study in King Abdulaziz University Hospital, Saudi Arabia" which showed that more than half

of the studied children had lack of awareness about warts.

Mothers reported practice regarding to allocating personal equipment showed that more than half of the of studied mothers allocated child's towel and clothes, most of them didn't share children's socks and shoes with others, nearly two thirds of them didn't cut the child's nails with special scissors, most of them didn't wash child's clothes separately and all of them didn't iron child's clothes.

From the researcher point of view, this finding might be due to lack of educational program about hygienic practices needed for children to avoid infection. Also moderate educational level of the mothers, young age of children beside and the nature of rural residence that allow sharing objects and personal equipment with others.

A study conducted by **Becker et al., (2022)** at a study about "Parents' Experience with a Mobile Health Intervention to Influence Human Papillomavirus Vaccination Decision Making: Mixed Methods Study" was in the same line with the current results , they mentioned that two thirds of the participants in their study had incorrect practice related to their children equipment.

As regards the studied mothers' reported practice regarding children's skin care, the present study results revealed that all of mothers mentioned that they wash their children's skin well, the majority of them didn't cover the child's warts during bath or swimming and more than half of them didn't prevent child from biting nails. Most of them dried their children skin and between fingers, while equal percentage applied topical treatment cleaned and covered any scratches in child skin.

This results explained from researcher prescriptive may be as mothers adhere to the treatment as prescribed by health care providers but they can't control children covering of warts during bath or swimming and also didn't able to prevent children's nail biting.

The current findings concurred with **Icardi et al., (2020**) who studied "Burden and prevention of HPV. knowledge, practices and attitude assessment among pre-adolescents and their parents in Italy" and study of , **Pathak et al., (2022)** who studied "Association of socio-demographic factors and personal hygiene with infectious childhood dermatitis**"** were in the same line with the present results.They revealed that most of the studied mothers had maintained skin care correctly to their children.

Concerning the studied mothers total practice towards warts preventive measures, the current study found that that more than half of studied mothers had unsatisfactory practice while more than one third of them had satisfactory practicing regarding warts preventing measures. These results can be supported by another study done by **El Attar et al., (2022)** who stated that more than three fifths of the studied mothers had unsatisfactory total reported practices level regarding warts disease

These findings were in contrast with another study by **Miyata et al., (2019),** was contraindicated with current results, they studied "Successful treatment with topical diphenyl cyclopropenone for three cases of ano-genital warts in children" in Yachiyo and found that less than one third of the

studied mothers had unsatisfactory total reported practices level regarding warts disease

Concerning the studied children reported practice of hand washing .The current study showed that more than half of the children dry hands with shared towels, about three quarters of them didn't rub each thumb separately and most of them didn't rub the palm of the hand in a circular motion by fixing the fingernails and rubbing them in the palm. Also, most of the studied children didn't rub the palm of the hand well, with the fingers intertwined, and the majority of them didn't rub the right wrist with the left palm. All of the children wet their hands with water, put quantity of soap on hand, and rub hands together to form foam.

From the researcher point of view, this might be explained as all of children perform routine hand washing correctly as basic hand washing awareness exists already in primary school age children. In the same context correct hand washing technique and infection control precautions are not always accurate and not adequately contextualized.

These results were matched with **Klar et al., (2022)** who studied "Knowledge about hand hygiene and related infectious disease awareness among primary school children in Germany" who revealed that more than half of the children in their study didn't follow hand washing steps.

Another study by **Tengku Jamaluddin et al., (2020)** who studied "Assessment on hand hygiene knowledge and practices among pre-school children in Klang Valley" was congruent with the current result. They represented that more than three quarters of the studied children had poor level in hand washing technique.

In relation to the studied children reported practice about sharing personal equipment and skin care, the current study showed that more than half of the studied children shared towel with their brothers. Also, most of studied children shared socks with other, more than half of them didn't cut nails with special scissors. Also, most of the studied children didn't share clothes with others, more than half of them didn't dry the skin after bath nor dry between fingers and the majority of them didn't cover the site of warts during swimming and bathing.

These results could be due to lack of training program and guidance provided to children whether at home or health care setting about personal hygiene practices. These results were similar to **Al-Worafi, (2024)** as their study was about "Warts Management in Developing Countries" and revealed that more than half of children were unaware about precautions for their personal equipment .

As regards children's total practice regarding warts preventive measures, the current result showed that more than two thirds of studied children had unsatisfactory practice.

From the researcher point of view, these results may be due to lack of knowledge among the studied children leading to unawareness of them about practice regarding warts preventing measures.

In the same context, **Naoum et al., (2022)** at a study about "Knowledge, perceptions and attitudes toward HPV vaccination: a survey on parents of girls aged 11–18 years old in Greece" found that most of the studied

children had unsatisfactory practice for HPV preventive measures.

The present results found that there was positive highly significant correlation between mothers' knowledge, hand washing, allocating personal equipment for child, clean child skin and Precautionary measures during touch warts. This result was in harmony with **Breznik et al., (2020),** who studied "Determination of causative human papillomavirus type in tissue specimens of common warts based on estimated viral loads" and found that there was positively statistically significant relation between studied sample total knowledge level and their practice regarding warts disease.

Regarding to correlation between total knowledge score of children regarding warts and their practice regarding prevention of warts, the current study found that there was positive highly statistical significant correlation between children' knowledge and hand washing, sharing personal equipment and skin care .

This result was congruent with **Wang et al., (2021)** who studied "Awareness and knowledge about human papilloma virus infection among students at secondary occupational health school in China" and reported that there was correlation between child personal data and their level of knowledge.

Conclusion and Recommendations:

It was concluded from the current study that, the majority of studied mothers had low level of knowledge regarding warts. All of the studied children had low level of total knowledge about warts. Mothers and their children had unsatisfactory practice regarding warts precautionary measures. There were positive significant correlations between mothers and their children total knowledge and their total preventive practices of warts.

Recommendations:

Based on the findings of the present study, the following recommendations are suggested:

- Develop an educational program for mothers and children about warts precautionary measures.
- Use an interactive and engaging teaching method to educate children about warts.
- Conduct regular hand washing and personal hygiene for both mothers and children based on need assessment to be able to deal with warts.
- Schedule regular skin checkup with healthcare providers, to prevent warts and other dermatology infectious disease.
- Create and distribute easy-to-understand pamphlets, colored booklet, videos, and other educational materials that explain wart prevention and management.
- Further researches are needed to assess the impact of educational programs on improving mothers' and children's knowledge and practices over time.
- Explore the psychological effects of warts on children on their mental health and quality of life.

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