Evaluation of Nurses' Practices Concerning Isolation Techniques for Adult Leukemic Patients in Baghdad Teaching Hospitals

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الخلاصـــة

الهـــدف: تقويم ممارسات الملاك التمريضي في مجال الرعاية المنعزلة لمرضى ابيضاض الدم البالغين.

المنهجيـــة: أجريت دراسة وصفية في غرف العزل لردهات مرضى ابيضاض الدم البالغين في مستشفيات بغداد التعليمية للفترة من (27) كانون الثاني 2008 إلى (27) من نيسان **2008** ولتحقيق أهداف الدراسةِ، تمّ اختيار عينة غرضيه "غير احتمالية" شملت (50) ممرض وممرضة من أربع مستشفيات تعليمية في مدينة بغداد و طبقاً لمواصفات عيّنةِ البحث.

اشتملت أدوات الدراسة جزئين رئيسين وحسب الدراسات المعتمدة، الجزء الأول المعلومات الديموغرافية للعينة والجزء الثاني أدوات الملاحظة، الذي يتكون من (83) فقرة. ولغرض تحديد صدق الأداة، تمّ عرضها على (12) خبير. تمّ تحديد ثبات الأداة باستخدام ملاحظة الباحث وشخص آخر بنفس مواصفات الباحث لملاحظة العينة كل على حدة ومعامل بيرسون ($r = 0.82$) عند مستوى ($p \leq 0.05$) التي تكون مقبولة إحصائيا. جمعت البيانات من خلال استمارة الملاحظة وتمّ تحليل البيانات من خلال تطبيق أسلوبين للتحليل الاحصائي: الإحصاء الوصفي (التكرارات، النسبة المئوية، الإنحراف المعياري، معدل الدرجات، الوسط الحسابي المرجح والكفاية النسبية) وتطبيق التحليل الاستنتاجي (معامل الارتباط).

النَتائـــج: بينت نتائج الدراسة وحسب النسبة المئوية لمدى ممارسات الملاك التمريضي لفقرات الاستمارة الاستبيانية (28،2 % خارج المقارنة للكفاية النسبية، 27،2 % كان أقل لمدى الكفاية النسبية، 31،1 % كان متوسط للكفاية النسبية، 13،6% كان عالي الكفاية النسبية) وهذا يظهر بأن أغلب ممارسات الملاك التمريضي متوسطة في مجال الرعاية المنعزلة لمرضى ابيضاض الدم البالغين.

التوصيات: استنادا إلى نتائج هذه الدراسةِ، أوصى الباحث بتطوير استمارة تقييم وتسجيل الممارسات التمريضية في الرعاية المنعزلة لمرض ابيضاض الدم البالغين وزيادة المستوى التعليمي للملاك التمريضي وزيادة البرامج التدريبية في مجال الرعاية المنعزلة لمرضى ابيضاض الدم البالغين.

Abstract:

Objective: To evaluate nurses' practices concerning isolation techniques for Adult Leukemic Patients (ALP).

Methodology: A descriptive study was carried out at the isolation rooms at leukemic wards in Baghdad Teaching Hospitals, starting from Jan. 27th 2008 up to the 27th of Apr. 2008. To achieve the objectives of study, a non-probability "purposive" sample of (50) nurse was selected out of four Teaching Hospitals in Baghdad city were selected according to the criteria of the study sample.

The study instrument consisted of two major parts. It is based on the review of literature. First is concerned with demographic data for nurses; and the second part is observational tool (checklist) is composed of (83) item. The content validity of the instrument was established through a panel of (12) experts. Reliability of the study scale was determined by the researcher and co-observe reliability was performed for determination of the checklist, pearson correlation coefficient was computed for each determination. The results indicated that the correlation coefficient was $r = 0.82$ at the level ($p \leq 0.05$) which was statistically acceptable. Data were collected through the use of the observational tool, which was analyzed through the use of two statistical approaches; descriptive statistical analysis (frequencies, percentage, standard deviation, range of scores, mean of scores and relative sufficiency) and inferential statistical analysis (correlation coefficient).

Results: The findings of study revealed that the evaluation of nurses' practices found (28.2%) was out of comparison relative sufficiency, (27.2%) was low relative sufficiency, (31.1%) was moderate relative sufficiency, and (13.6%) was high relative sufficiency what means that most of the nurses' practices is of moderate scores.

Recommendations: According to the results of this study, the researcher recommends to develop an assessment sheet for skill and daily note in the leukemic wards for isolation rooms of adult leukemic patients, the education level should be improved, a special training program should be given for the nurses working in leukemic wards.

Key words: **Nurses' practices, Isolation Techniques, Leukemic Patients.**

Introduction:-

Leukemia is the general term used to describe a group of malignant disorders affecting the blood and blood–forming tissues of the bone marrow, lymph system, and spleen. Leukemia occurs in all age–group. It results in an accumulation of dysfunctional cells, because of a loss of regulation in cell division. It follows a progressive course that is eventually fatal if untreated [1] The leukemia account for (2%) of all newly diagnosed cases of cancer and 4% of all cancer deaths [2].

The incidence and frequency of leukemia depend on many factors including the type of white blood cell affected, age, gender, race, and geographic location. Approximately, (28.900) new

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cases of leukemia occur each year in the United States, and the numbers have been increasing over the past three decades. Leukemia is most common in Caucasian males [3]. In Sweden, leukemia accounts for (2.2%) of all new cancer diagnosis and (2.6%) of all cancer death [4]. The areas of highest mortality from leukemia were in northern and central Europe and the lowest in South America and Asia in both sexes [5].

Most leukemia cases are turning up in southern Iraq, where military activity was most intense. Even in Baghdad, in central Iraq, the majority of the patients in the leukemia ward at Hospitals of Baghdad is referred from towns and cities in the south, such as Basra, Nasiriyah, Kerbala and Najaf [6]. In Iraq, leukemia represents about (6%) of all cancers. In 1976, about (170) new case was diagnosed while, in 1997 about (515) new case was found [7]. There are no exact figures for the number of deaths from leukemia in Iraq. The World Health Organization office in Baghdad does not question the Iraqi Health Ministry's estimate that since 1990 there has been a fourfold increase in the incidence of the disease [6].

The nurse is an important advocate in helping the patient and family to understand the complexities of treatment decisions and manage the side effect and toxicities [8]. The nurse has contact with the patient 24 hours a day, and can help reverse feeling of abandonment and loneliness by balancing the demanding technical needs with a humanistic caring approach [9].

The nurse plays an important role in the application of aseptic technique in isolation room during care of leukemic patient during his/her critical situation. For these reasons, the researcher has undertaken this research. Nurse plays a vital role in the prevention of infection in patients with leukemia through nursing practice, research and patient education. However, many common nursing interventions to prevent infection are based on tradition or expert opinion and have not been subjected to scientific examination [10].

Methodology:

A descriptive study was carried out to evaluate nurses' practices concerning isolation techniques for adult leukemic patients in Baghdad Teaching Hospitals starting from Jan. 27th 2008 up to the 27th of Apr. 2008.

The study was conducted in isolation rooms at wards of leukemia at four Teaching Hospitals in Baghdad City (Baghdad Teaching Hospital, Al-Kadhimiyia Teaching Hospital, Children Welfare Pediatric Teaching Hospital, and The National Center of Hematology). These hospitals provide isolation caring for Adult Leukemic Patients.

A non-probability "purposive" sample of (50) nurse that involves all of nurses who provided isolation techniques for adult patients and according to the following criteria: 1. nurses in different levels of education, 2. both sexes, 3. nurses who provide isolation techniques for adults patients age (18) year and above who have been diagnosed with leukemia by physician.

The validity of the instrument was established through a panel of (12) experts in different fields. Reliability of the study scales was determined by the researcher and co-observe reliability was performed for determination of the checklist, pearson correlation coefficient was computed for each determination. The results indicated that the correlation coefficient was $r = 0.82$ at the level of ($p \leq 0.05$) which was statistically acceptable.

The researcher used the appropriate statistical means in the data analysis which include the Descriptive Data Analysis (frequencies (f), percentage (%), cumulative percentage, mean, standard deviation (SD), Mean of score (MS). A mean of score equal to (1.5-2.5) was considered as moderate MS, greater than (2.5) was considered as high MS, less than (1.5) was considered as low MS. The mean of score was computed through the use of the following formula:

$$M.S. = \sum ri=1Fi \times Si/\sum ri=1Fi.$$

Relative Sufficiency (RS): Relative sufficiency was assessed for nurse's practices by three grades (low, moderate, high) which was calculated as: Rs = (Mean of score / No. of score) x100.

The data of practices were ordinal according to the three level scale which were scored as (Never = 1, Sometimes = 2, Always = 3) for each level respectively. So, the cut-off point was (2) and the lowest value for acceptance was (66.67%) as calculated through the following formulas:

Rs = (Cut of point/3) x 100= 66.67

100–66.67 = 33.33/3= 11.11

(11.11) was the interval between first and last degree in the same level. 1'heorctical relative sufficiency based on early state facts that there were several levels for evaluating the limits of acceptance starting from low (66.67) through the severe limit (100). So, the interval ranged between (66.67-100%) [11]. Suggestion was made for classifying the early stated interval for practice into main categories of evaluation (E.) as follows:

(L)= Low level (66.67-77.78)

(M)= Moderate level (77.79-88.89)

(H)= High level (88.90- 100)

(O.C)= Out of Comparison (less than 66.67) **or** (more than 100)

Inferential data analysis approach was performed through the determination of Pearson correlation coefficient.

Results:

Table 1. Distribution of nurses by their characteristics

No.	Variables			
1.	Age (years)	f	%	Cumulative%
1.1.	Less than 20	1	2	2
1.2.	20 – 29	13	26	28
1.3.	30 -39	21	42	70
1.4.	40 – 49	11	22	92
1.5.	50 and more	4	8	100
	Total	50	100	
2.	Gender	f	%	Cumulative%
2.1.	Male	29	58	58
2.2.	Female	21	42	100
	Total	50	100	
3.	Level of education	f	%	Cumulative%
3.1.	Nursing Intermediate School graduate	11	22	22
3.2.	Nursing High School graduate	15	30	52
3.3.	Nursing Institute graduate	13	26	78
3.4.	Nursing college graduate	11	22	100
	Total	50	100	
4.	Years of employment in Nursing (years)	f	%	Cumulative%
4.1.	Less than 1	4	8	8
4.2.	1 – 5	10	20	28
4.3.	6 – 10	11	22	50
4.4.	11 -15	8	16	66
4.5.	16 -20	6	12	78
4.6.	21 and more	11	22	100
	Total	50	100	

Table 1. (continued)

5.	Years of Experience in the leukemic wards	f	%	Cumulative%
5.1.	Less than 1	9	18	18
5.2.	1 – 5	27	54	72
5.3.	6 – 10	12	24	96
5.4.	11 – 15	0	0	96
5.5.	16 – 20	0	0	96
5.6.	21 and more	2	4	100
	Total	50	100	
6.	Training Sessions in the isolation techniques for ALP	f	%	Cumulative%
6.1.	Nil	28	56	56
6.2.	1-2	15	30	86
6.3.	3-4	5	10	96
6.4.	5-6	2	4	100
	Total	50	100	

f= frequency, %= percentage

This table shows that the distribution of age indicated that the majority of participants was of ages (30-39) years old (42 %). Most of them (58 %) was male. The level of education represents that most of them (30%) was from nursing high school, (22 %) for each (6-10) years and (21 years and more) were employed in nursing, majority of them (54%) was employed (21 year and more) in the leukemic wards, and (56 %) of them did not have training sessions in the isolation techniques for adult leukemic patient.

Table 2. The mean of scores and relative sufficiency of nurses' practices for standard precautions, Part I. Hand washing.

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Washing hands before the entering to the patient's room.	7	14	20	40	23	46	2.32	77.33	L
2.	Wearing of the gloves after washing hand.	11	22	18	36	21	42	2.2	73.33	L
3.	Washing hands after leaving the patient's room.	6	12	21	42	23	46	2.34	78	M
4.	Washing hand from above down ward.	9	18	29	58	12	24	2.06	68.66	L
5.	Using antimicrobial soap for hand washing.	5	10	27	54	18	36	2.26	75.33	L
6.	Using an antimicrobial agent or an antiseptic agent.	5	10	27	54	18	36	2.26	75.33	L

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table indicated that the evaluation of relative sufficiency was moderate on item (3), while items (1,2,4,5,6) were low.

Table 3. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part II. gloves

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Removing gloves before touching non-contaminated items and surfaces.	11	22	26	52	13	26	2.04	68	L
2.	Wearing of sterile gloves when drugs are given for patient.	15	30	14	28	21	42	2.12	70.66	L
3.	Changing Gloves between patients.	13	26	18	36	19	38	2.12	70.66	L

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reveals that the evaluation of relative sufficiency was low on all items.

Table 4. The mean of scores and relative sufficiency of nurses' practices for standard precautions, Part III. gowns

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Wearing of Gowns only once.	22	44	12	24	16	32	1.88	62.66	O.C
2.	Removing a soiled gown carefully.	22	44	6	12	22	44	2	66.66	O.C
3.	Washing hands after removing gloves and gowns.	19	38	20	40	11	22	1.84	61.33	O.C

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table indicated that the evaluation of relative sufficiency was out of comparison on items (1, 2, and 3).

Table 5. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part IV. masks and respirators

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Changing the face mask each 30 minute.	31	62	17	34	2	4	1.42	47.33	O.C
2.	Wearing surgical mask for protection from large particle droplets.	16	32	21	42	13	26	1.94	64.66	O.C
3.	Wearing respirator mask.	33	66	12	24	5	10	1.44	48	O.C

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table indicated that the evaluation of relative sufficiency was out of comparison on all items.

Table 6. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part V. cover of head (Caps).

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Wearing Cover of head when care is provided for patients.	33	66	13	26	4	8	1.42	47.33	O.C
2.	Covering hair's head with caps completely.	12	24	27	54	11	22	1.98	66	O.C
3.	Removing a soiled Cover of head carefully.	16	32	17	34	17	34	2.02	67.33	L
4.	Covering the heads of patients with caps	19	38	14	28	17	34	1.96	65.33	O.C

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

Table (6) indicated that the evaluation of relative sufficiency was out of comparison on items (1, 2, and 4) and one item (3) was low.

Table 7. The mean of scores and relative sufficiency of nurses' practices for standard precautions, Part VI. medical shoes.

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Wearing surgical shoes during the entrance to isolation room.	35	70	5	10	10	20	1.5	50	O.C
2.	Removing a soiled shoe carefully.	35	70	6	12	9	18	1.48	49.33	O.C
3.	Sterilizing shoes every day.	36	72	6	12	8	16	1.44	48	O.C
4.	Keeping shoes in clean place.	35	70	6	12	9	18	1.48	49.33	O.C

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

The findings of this table show that the evaluation of relative sufficiency is out of comparison on all items.

Table 8. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part VII. patient's room (environment)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Placing the patient in a special room which has positive air pressure 6 to 12 air changes per hour	8	16	14	28	28	56	2.4	80	M
2.	Patients, who are infected with the same microorganism, should be placed together If a private room is not available.	18	36	4	8	28	56	2.2	73.33	L
3.	Sterilizing the isolation room at least once daily.	10	20	12	24	28	56	2.36	78.66	M
4.	Writing isolation instructions and attaches on door of the patient's room.	16	32	21	42	13	26	1.94	64.66	O.C
5.	Taking microorganisms swap for patient's room each fifteen days.	11	22	18	36	21	42	2.2	73.33	L
6.	Don't allow fresh flowers.	1	2	15	30	34	68	2.66	88.66	M
7.	Washing walls, blinds, and curtains if soiled.	9	18	15	30	26	52	2.34	78	M

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reveals that the evaluation of relative sufficiency was moderate on items (1,3,6 and 7), low on items (2 and 5), and item (4) was out of comparison.

Table 9. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part VIII. management of contaminated Items

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Cleaning reusable equipment with soap and water.	2	4	7	14	41	82	2.78	92.66	H
2.	Disposing single-use equipment correctly.	1	2	22	44	27	54	2.52	84	M
3.	Marking Containers which are used to transport contaminated items with a biohazard label.	14	28	14	28	22	44	2.16	72	L
4.	Using hot water and detergents to dishwashers.	1	2	21	42	28	56	2.54	84.66	M

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

Table (9) reported that the evaluation of relative sufficiency was highly on item (1), moderate on items (2 and 4), and low on item (3).

Table 10. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part IX. trash/waste management

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Using tan autoclave bags for keep patient's of blood/body fluids.	17	34	25	50	8	16	1.82	60.66	O.C
2.	Using a plastic bag to keep patient's waste.	1	2	13	26	36	72	2.7	90	H
3.	Hand washing following waste disposal.	1	2	7	14	42	84	2.82	94	H

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table presented that the evaluation of relative sufficiency was highly on items (2 and 3), and out of comparison on item (1).

Table 11. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part X. linen.

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Handling linen that is soiled with blood, fluids, secretions, or excretions.	22	44	16	32	12	24	1.8	60	O.C
2.	Transporting linen that is soiled with blood, fluids, secretions, or excretions.	22	44	16	32	12	24	1.8	60	O.C
3.	Processing linen that is soiled with blood, fluids, secretions, or excretions.	23	46	15	30	12	24	1.78	59.33	O.C

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

The findings of table (11) presented that the evaluation of relative sufficiency was out of comparison on all items.

Table 12. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part XI. patient management (personal hygiene)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Making general hygiene only once a day.	1	2	19	38	30	60	2.58	86	M
2.	Providing sterile soap.	3	6	11	22	36	72	2.66	88.66	M
3.	Avoiding the use of makeup.	2	4	7	14	41	82	2.78	92.66	H
4.	Providing for Oral hygiene after each mealtime.	8	16	13	26	29	58	2.42	80.66	M
5.	Using antiseptic solution to wash patient's mouth.	10	20	8	16	32	64	2.44	81.33	M
6.	Using soft and smooth brush to clean patient's teeth.	9	18	9	18	32	64	2.46	82	M
7.	Preventing skin dryness with water soluble lubricants.	3	6	17	34	30	60	2.54	84.66	M
8.	Using fingernails' scissors in offered uses round.	3	6	28	56	19	38	2.32	77.33	L
9.	Keeping fingernails trimming before entering to patient's room.	2	4	30	60	18	36	2.32	77.33	L
10.	Keeping patient's fingernails cut and short before entering to room.	4	8	25	50	21	42	2.34	78	M
11.	Using hot water and laundry detergent to wash clothing.	1	2	16	32	33	66	2.64	88	M
12.	Removing soiled Books, Magazines, and Toys.	13	26	22	44	15	30	2.04	68	L
13.	Using electrical razors to shave patient's hair.	14	28	19	38	17	34	2.06	68.66	L

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reported that the evaluation of relative sufficiency was highly on item (3), moderate on items (1, 2.4, 5, 6, 7, 10 and 11), and low on items (8, 9,12, and 13).

Table 13. The mean of scores and relative sufficiency of nurses' practices for standard precautions, Part XI. Patients' management (monitoring)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Monitoring complete blood picture daily.	0	0	2	4	48	96	2.96	98.66	H
2.	Monitoring places of hemorrhage and color and characteristic's of faces skin and urine.	0	0	11	22	39	78	2.78	92.66	H
3.	Monitoring and recording of signs and symptoms of infection (T.P.R.)	1	2	1	2	48	96	2.94	98	H

Table 13. (continued)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
4.	Monitoring and recording complications of chemotherapy (i.e., decrease account of white blood cells, hemoglobin, and Platelets).	1	2	11	22	38	76	2.74	91.33	H
5.	Monitoring and recording signs and symptoms of increased intracranial pressure.	1	2	16	32	33	66	2.64	88	M

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reveals that the evaluation of relative sufficiency was highly on items (1, 2, 3 and 4), moderate on item (5).

Table 14. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part XI. patient management (therapy)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Using small size and gauge needle during injection of medications.	0	0	16	32	34	68	2.68	89.33	H
2.	Avoiding suppositories, rectal treatment.	1	2	4	8	45	90	2.88	96	H
3.	Avoiding use rectal thermometer.	0	0	9	18	41	82	2.82	94	H
4.	Using laxative during provide care to patients.	13	26	12	24	25	50	2.24	74.66	L
5.	Inspecting I.V. site each time.	1	2	17	34	32	64	2.62	87.33	M
6.	Placing pieces of sterile gauze around the site of cannula and change when soiled.	11	22	10	20	29	58	2.36	78.66	M
7.	Changing cannula every 48 hours.	1	2	16	32	33	66	2.64	88	M
8.	Label site of cannula.	7	14	10	20	33	66	2.52	84	M
9.	Cleaning site of cannula with antimicrobial solution before vein puncture.	1	2	12	24	37	74	2.72	90.66	H
10.	Replacing blood and platelets with transfusion as prescribed.	0	0	5	10	45	90	2.9	96.66	H

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reported that the evaluation of relative sufficiency was highly on item (1, 2, 3, 9 and 10), moderate on items (5, 6, 7 and 8), and low on item (4).

Table 15. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part XI. patient management (dietary)

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Changing drinking water every 8 hours	5	10	41	82	4	8	1.98	66	O.C
2.	Avoiding outside reach diet.	14	28	15	30	21	42	2.14	71.33	L
3.	Restricting fresh salads.	3	6	17	34	30	60	2.54	84.66	M
4.	Cooking diet well before provided to patients.	5	10	11	22	34	68	2.58	86	M
5.	Taking snacks or nutritional drinks frequently.	4	8	25	50	21	42	2.34	78	M
6.	Having diet which is rich with protein.	17	34	16	32	17	34	2	66.66	L
7.	Increasing intake of diet which is rich with Vit. A.	9	18	27	54	14	28	2.1	70	L
8.	Discussing with patient's family about type of diet that it will be brought to patient.	7	14	22	44	21	42	2.28	76	L
9.	Avoiding diet contain raw pepper and spices.	14	28	6	12	30	60	2.32	77.33	L
10.	Avoiding Cold meats, salads, and fresh fruits.	13	26	6	12	31	62	2.36	78.66	M
11.	Taking no tap water or still mineral water.	10	20	8	16	32	64	2.44	81.33	M

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

This table reported that the evaluation of relative sufficiency was moderate on items (3, 4, 5, 10 and 11), low on items (2, 6, 7, 8 and 9) and out of comparison on item (1).

Table 16. The mean of scores and relative sufficiency of nurses' practices for standard precautions, part XII. family and visitors

No.	Items	Never		Sometimes		Always		MS	RS	E
		f	%	f	%	f	%			
1.	Using surgical masks for visitors of patients before entering to the patient's room.	19	38	11	22	20	40	2.02	67.33	L
2.	Hand washing when leaving the patient's room.	19	38	24	48	7	14	1.76	58.66	O.C
3.	Initiating regular schedule of visitors.	16	32	16	32	18	36	2.04	68	L
4.	Preventing visitors who have common cold.	10	20	5	10	35	70	2.5	83.33	M

E=estimate, f= frequency, MS=Mean of Scores, RS=Relative Sufficiency

Table (16) reveals that the evaluation of relative sufficiency was moderate on item (4), low on items (1 and 3) and out of comparison on item (2).

Discussion:

Through the data analysis distribution of demographic variables, the present study reported that the age range is between less than 20 year to 50 year and more and the age of majority is 30-39 year which accounts for 21 (42 %). The mean of the age is (35) year and (9.44) is the standard deviation.

Most of the sample was males (29) (58%), (15) (30 %) graduated from nursing high school.

Eleven (22%) with (6-10) years of employment in nursing and similar percent 11 (22%) with (21) year and more, (27) (54%) with (1-5) years of experience in the leukemic wards.

Concerning training sessions in the isolation techniques for adult leukemic patients, Table (1) indicated that high percentages (56%) of the nurses don't have training sessions in the isolation techniques. This result is agreed with that obtained from study done by (Bucaneve, et al., 2005) who indicated that the highest percentage (21) (42%) of nurses at (30-39) years old, and present the highest percentage (58%) of nurses was male, the level of education is disagreed with the present study that revealed the highest percentage (90%) was nursing college graduates, the highest percentage (80%) has (6-10) years of employment in nursing, and highest percentage (85%) has (1-5) years of experience in the leukemic wards [10]

Low relative sufficiency in five items are related to "washing hands before the entering the patient's room", "wearing of the gloves after washing hands", "washing hands from above down ward", "using antimicrobial soap for hand washing", "using an antimicrobial agent or an antiseptic agent" (Table 2). This result showed that most of nurses has poor practice of hand washing in the correct way. The moderate relative sufficiency of the item "washing hands after leaving the patient's room". Hand washing is a simple and effective intervention to reduce the spread of infection. Despite this common knowledge, providers disregard this intervention. Compliance by providers with recommended hand hygiene procedures has remained unacceptable.

Low relative sufficiency in all items are related to wearing gloves (Table 3). These results are disagreed with the recommendation of the Centers for Disease Control (CDC) 2007 which emphases wearing clean gloves when touching blood, body fluids, and contaminated items. Put on clean gloves just before touching mucous membranes and non-intact skin. Change gloves between tasks and procedures on the same patient after contact with material that may contain a high concentration of microorganisms. Remove gloves promptly after use, before touching non-contaminated items and environmental surfaces, and before going to another patient, and wash hands immediately [12].

The relative sufficiency of nurses' practices was out of comparison for all items concerning wearing of gowns (Table 4) which was inadequate nurses' practice about wearing gown during provide caring for adult leukemic patients in isolation room. This result is disagreed with the recommendation of the CDC, 2007 which emphasizes on wearing a gown to protect skin and to prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood or body fluids. Remove the soiled gown as promptly as possible and wash hands [12]

All items of nurses' practices related to masks and respirators are out of comparison for nurses' practices (Table 5) which means inadequate nurses' practices about applying masks and respirators by nurses. This result is disagreed with Ague's study (2007) which he emphasizes wearing a mask and eye protection or a face shield to protect mucous membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood or body fluids [13].

Items of nurses' practices related to cover of head (Caps) in (Table 6) revealed the low relative sufficiency in one item of "removing a soiled cover of head carefully "which means poor applying and removing a soiled cover of head, and the out of comparison for nurses' practices in the three items "wearing cover of head when care is provided for patients", "covering hair and head with caps completely" and "covering the heads of patients with caps".

All items of nurses' practices related to medical shoes are out of comparison for nurses' practices

(Table 7), this result showed that malpractices concerning medical shoes. The studies that support this study are few and also CDC doesn't confirm wearing medical shoes although it is important to prevent infection.

The result presented in table (8) showed that the moderate relative sufficiency for four items of "placing the patient in a special room which has positive air pressure 6 to 12 air changes per hour", "sterilizing the isolation room at least once daily", "Don't allow fresh flowers" and "washing walls, blinds, and curtains if soiled".

The low relative sufficiency of two items of "patients who are infected with the same microorganism, should be placed together if a private room is not available" and "taking microorganisms swab for patient's room each fifteen days". The out of comparison of item "writing isolation instructions and attaches on door of the patient's room. This finding is disagreed with the results obtained from study done by Roman and Mulderrig, (2007) which indicated that high mean of score for nurses' practices concerning patient's room (Environment) [14]. Table (9) indicated that the highly relative sufficiency in one item of "cleaning reusable equipment with soap and water" which means that nurses cleaning reusable equipment with soap and water.

The moderate relative sufficiency in the two items of "disposing single-use equipment correctly" and "using hot water and detergents to dishwashers". The low relative sufficiency for nurses' practices in the item of "marking containers which are used to transport contaminated items with a biohazard label" which means poor nurses' practices in marking containers with soiled materials with a biohazard label. This result is disagreed with the recommendation of the CDC, 2007 which emphasize on handling used patient-care equipment soiled with blood or body fluids in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients and environments. Clean or reprocess reusable equipment before using it for the care of another patient. Ensure that single-use items are discarded properly [12].

High relative sufficiency occurred in two items of "using a plastic bag to keep patient's waste" and "hand washing following waste disposal" which means that the nurses are using a plastic bag and hand washing concerning trash/waste management. The out of comparison item "using tan autoclave bags for keeping patient of blood/body fluids" (Table 10). This result which presented malpractices in using tan autoclave may be unavailable equipment for most of nurses in leukemic wards. The result is agreed with recommendation of the CDC, 2007. The management of soiled waste emanating from the healthcare environment is subject to federal and state regulations for medical and non-medical waste. No additional precautions are needed for non-medical soiled waste that is being removed from rooms of patients on transmission-based precautions. Soiled waste may be contained in a single bag (as compared to using two bags) of sufficient strength [12].

Out of comparison relative sufficiency of all items concerning management of linen (Table 11). This result which reveals cleared inadequate nurses' practices concerning management of linens. The results of the present study is disagreed with recommendation of the CDC, 2007 that indicated handle, transport, and process used linen soiled with blood or body fluids in a manner that prevents skin and mucous membrane exposures and contamination of clothing and that avoids transfer of microorganisms to other patients and environments [12].

From the result presented in the table (12), high relative sufficiency of the item of "avoiding the use of makeup" which means good practices that serve to identify prognosis of patient by observing signs on face such as pallor, especially for female patients.

The moderate relative sufficiency of items "making general hygiene only once a day", " providing sterile soap", "providing for oral hygiene after each mealtime", "using antiseptic solution to wash patient's mouth", "using soft and smooth brush to clean patient's teeth", "preventing skin dryness with water soluble lubricants", "keeping patient's fingernails cut and short before entering to room", and "using hot water and laundry detergent to wash clothing".

The low relative sufficiency of items of "using fingernails scissors in offered uses round", " keeping fingernails trimming before entering to patient's room", "removing soiled books, magazines, and

toys" and "using electrical razors to shave patient's hair". This result showed that poor nurse practice may lead to increase infection to adult leukemic patients in isolation room. This result is disagreed with study conducted by Roman and Mulderrig (2007) which showed that high mean of score for all items of personal hygiene [14].

From the results which presented in the table (13), there are four items include "monitoring complete blood picture daily", "monitoring sites of hemorrhage and color and characteristics of faeces, skin and urine", "monitoring and recording of signs and symptoms of infection (temperature, pulse, and respiration)", and "monitoring and recording complications of chemotherapy (i.e., decrease account of white blood cells, hemoglobin, and platelets)" which evaluates highly relative sufficiency and other item such as "monitoring and recording signs and symptoms of increased intracranial pressure" which means good practices concerning patient's management such as monitoring patients' status, because it was being followed by physician. The results of the present study are agreed with study done by Shah and Ali, (1996) who stated the nurse must assess and monitor all the above items daily [15].

Highly relative sufficiency of items of "using small size and gauge needle during injection of medications," "avoiding suppositories, rectal treatment," "avoiding the use rectal thermometer"," cleaning site of cannula with antimicrobial solution before vein puncture", and "replacing blood and platelets with transfusion as prescribed" (Table 14). This means good practice for nurses concerning isolation caring about therapy for adult leukemic patients in leukemic wards. The moderate relative sufficiency of items of "inspecting I.V. site each time", "placing pieces of sterile gauze around the site of cannula and changing them when soiled", "changing cannula every 48 hours", and "labeling site of cannula". The low relative sufficiency of item of "using laxative during providing care to patients" so, this means that nurses have poor practices. This result is agreed with study conducted by Shah and Ali, (1996) which showed that nurses must take special considerations during providing therapy for adult leukemic patients who have isolation measurements [15].

Through the data analysis, the study presents (Table 15) the moderate relative sufficiency of five items of "restricting fresh salads, cooking diet well before it provided to patients", "taking snacks or nutritional drinks frequently", "avoiding cold meats, salads, and fresh fruits" and "taking no tap water or still mineral water". The low relative sufficiency of items of "avoiding outside reach diet", "having diet which is rich with protein", "increasing intake of diet which is rich with Vit. A", "discussing with patient's family about type of diet that it will be brought to patient" and "avoiding diet contain raw pepper and spices". So, this means poor nurses' practices. The out of comparison for items of "changing drinking water every 8 hours". Results of the present study indicated malpractices of nurses concerning patients' management for patients' dietary lead to increase risk of infection for adult leukemic patients.

This result is disagreed with Larson and Nirenberg, (2004) study which showed that the role of nurses in providing and maintaining neutropenic diet in preventing infection [16].

The moderate relative sufficiency of one item of "preventing visitors who have common cold". The low relative sufficiency of two items of "using surgical masks of patient's visitors before entering to the patient's room" and "initiating regular schedule of visitors". The out of comparison of item "hand washing when leaving the patient's room" (Table 16).

The result which showed inadequate nurses' practices related to family and visitors that may lead to increase infection for adult leukemic patients. This study disagree with recommendations that edited by CDC,2007 included visitors may be restricted, use surgical masks for visitors of patients before entering to the patient's room, hand washing when leaving the patient's room, initiating regular schedule of visitors, and preventing visitors who have common cold.[12]

Recommendations:

1. Establishing new standard checklist suitable for nurses' practices concerning isolation techniques for adult leukemic patients in Iraq depending on standard checklist of foreign and Arabic countries and upon the result of this thesis.

2. Special training programs should be designed and constructed for nurses in this area to reinforce their skill and promote their experiences.
3. Providing opportunity for nurses in leukemic ward to continuing updating their education to maintain knowledge and skills, as well as updated in leukemic wards.

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