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Editorial

Open Access

Health Literacy: A Transformative Force in Preventing Disease

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Even today, in our information-saturated society, health illiteracy is a reality. However, there is also a large percentage of people who are unable to know what is real and what isn't (Fake), which leads to making unhealthy decisions and living unhealthy lifestyles. Health literacy, as the power to learn, understand, and use health information, is not a method; it is a quiet force that decides if populations flourish in wellness or perish from avoidable disease. Above everything else, in nations such as Pakistan, where healthcare access is disproportionate and misinformation reigns, health literacy focus can be a transformative step toward preventing disease (1). Health literacy is not just about reading prescription labels or understanding a doctor's advice; it prepares people to question, analyze, and make informed decisions about their well-being (2).

In Pakistan, the issues of low health literacy are compounded by high levels of misinformation, traditional cultural beliefs, and limited access to reliable health information (3). The infant mortality rate is high, too — many women do not receive prenatal care simply because they are unaware of the health risks to themselves and their unborn. Enhancing health literacy through school curriculums, digital health platforms, and community-based education is crucial, contributing to healthier populations and decreasing the burden on healthcare infrastructure.

Innovative Approaches to Health Literacy

Public health campaigns have failed to improve public health indicators in Pakistan because rural areas suffer from low literacy and limited access to health information. However, new methods for effectively realizing health literacy approaches are surfacing — based on digital innovation, and behavioral psychology (4). Gamification presents a successful approach by embedding health education within mobile games and apps to attract younger populations. The focus of digital health applications on telemedicine services has led to a neglect of educating users regarding disease prevention and health management. The healthcare industry suffers a significant gap because it lacks interactive platforms that focus on teaching the socio-cultural and linguistic aspects of Pakistan. Chatbots that use artificial intelligence to answer health questions in native languages can help improve health literacy levels. Scaling such technologies to deliver essential, localized health literacy information can enable people to make informed health decisions (5). Health communication incorporating storytelling through documentaries and podcasts about real-life experiences creates narratives that connect with Pakistani audiences and opens opportunities for health literacy improvement and behavioral change.

A Call to Action for All Stakeholders

Improving health literacy focuses on governments or healthcare systems and everyone coming together for the common good. Policymakers should consider health literacy an essential part of national health policies, including education and community development initiatives. Public health laws need to require clear patient information, and health services need to be aimed at people of all literacy levels.

Creating an environment that motivates curiosity and can stimulate critical thinking skills tremendously enhances health literacy. People should be responsible for interrogating health claims, looking for several ways to confirm them, and discussing health with their families and communities. Schools, workplaces, and even places of worship can be used to host participatory health literacy workshops and help society adjust proactively instead of reactively concerning health.

Conclusion

Health literacy is not just an academic endeavor—it could adversely affect the future of public health. While bullying behavior may inflict personal distress, misinformation, culture, and disproportionality in the healthcare system can all inhibit disease avoidance behavior, then the resulting chaos will continue to create a demand and urgency for reform in the area of

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health literacy education. Thanks to technology development, community programs, and health education policy reform, a nation can help make good use of health literacy to fight against applicable sicknesses. To implement a healthier world, we need information that must be accessible, engaging, and crucially actionable. A health-literate citizenry in Pakistan is possible, but the country needs the vision to transition awareness to authentic practice.

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Original Article

Open Access

Prevalence of Lumbago in Construction Workers of Lahore: A cross-sectional Study

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ABSTRACT

Background and Objectives: Building industry is the most important and main industry of the world in field of construction. Jobs that are either actually hard or need repetitive lifting are a high threat for back ache. The construction workers are at risk of such musculoskeletal injuries. The main objective of the study is to find out the prevalence of lumbago in construction workers of Lahore.

METHODOLOGY: Cross- sectional study was conducted to determine the frequency of lumbago in construction workers. The total participants were 100 of age between 20 to 40 years. Data was collected from the construction sites in Lahore. Structured questionnaire was used in data collection. Simple non probability convenient sampling technique was used to collect the data.

RESULTS: There were total 100 participants, out of them 72% (n=72) participants have lumbar discomfort and 28% (n=28) participants were without lumbar discomfort.45% (n=45) were those who had no radiation of pain on either side and 55% (n=55) are those who had radiating back pain. Pain and incorrect posture are negatively correlated (r value -0.92).

CONCLUSION: Lumbago is highly prevalent in construction workers. Working position and long working hours are strong contributing factors in lumbago. Poor posture and pain are negatively correlated (p value <0.05 and r value is -0.92). The overall prevalence of lumbago among the construction workers in studied population is about 72%.

KEYWORDS: Biomechanics, Construction Industry, Posture, Prevalence, Low Back Pain, Musculoskeletal Disorders.

INTRODUCTION

Low back ache (LBA) is a problem often complained by every single individual, 50% of workers hurt every year from LBP (1). The physical threats continuously top to enlarged risk of Musculoskeletal Complaints. Jobs that are either actually hard or need repetitive lifting are at a high threat for accident-injuries. One condition that repeatedly cause employee to report back ache or to essentially bear an injury is where an occasion that is not expected cause an injury while acting the task, example is the pulling of back muscles by incorrect lifting (2). However, it also appears to be more common among construction manual workers compared to all occupational groups (3) due to the drifting, high mechanical nature, uncomfortable postures for long hours and hard manual workers of construction work (4). The happenings involved in construction work exert a lot of strain on spinal structures and therefore lead to Low back ache (5).

Among MSDs, low back ache (LBA), defined "as a sharp or dull ache or muscular rigidity happening in the spinal region, i.e., the region between the lower costal margins and gluteal folds, the ache being either localized or radiating into the lower extremities (Ischialgia)', (6) is a most important cause of disability amongst workforce global (7). Physical stresses such as repetitive bending and twisted and heavyweight lifting are significant possibility factors associated with the occurrence of work-related LBP. Other risk factors include age, sex, type of work, length of employment, individual factors (e.g., smoking, heavy weigh/obesity and absence of physical exercise) and awareness of safe lifting principles (8).

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Pain syndromes are related to impaired postures. A postural fault is a posture that deviates from normal alignment but has no structural impairments. Postural pain syndrome refers to the pain that result from the mechanical stress when a person maintains a faulty posture for a prolonged period; the pain is usually relieved with activity. There are no impairments in functional strength or flexibility, but if the faulty posture continues, strength and flexibility imbalances eventually develop (9). Postural dysfunction differs from postural pain syndrome in that adaptive shortening of soft tissue and muscle weakness are involved. The cause may be prolonged poor postural habits, or the dysfunction may be a result of contractures and adhesions formed during the healing of tissues after trauma or surgery. Stress to the shortened structures cause pain (10).

METHODOLOGY

It was a cross-sectional study conducted over four months at different construction sites of Lahore. The study population was construction workers. An approval letter was received from The University of Faisalabad. A convenient sampling technique was used. The sample size was calculated by using epitool as 100, at a 95% confidence interval and acceptable error 5%. Construction workers who were male, aged between 20-40 years having work experience from 6 months to 5 years and were willing to participate in the study were included. The exclusion criteria included construction workers who were unwilling to participate and those who had a history of surgery (like discectomy), trauma (like fracture) and disc herniation or bulge. Data was collected through structured questionnaires distributed among construction workers by approaching them directly on the construction sites. A questionnaire consisting of parts (socio-demographic and general profile, VAS of pain and REDCO posture assessment scale) was used. VAS (Visual Analogue Scale) comprised of score from 0-10, with 0 indicating the lowest score (no pain) and 10 being the highest (worst pain).

REDCO posture assessment scale used to evaluate postural changes The total participants were 100, total score was 100 including 0-29 (very low), 30-59 (low), 60-89 (high) and 90-100 (very high).

Structural manufacturing has pivoted roll in manufacturing of the organization. The structural manufacturing (houses, shops, offices etc.) labors were involve in dissimilar occupations for example masons, cement mixture, plumbers, electricians, carpenters, and crane operators etc. These may include holding heavy objects or heavy body work in uncomfortable working postures, in building manufacturing this can leads to several WMSDs (11). Mostly building labors are at high risk of jobs related musculoskeletal disorder since they were often exposed to difficult or uncomfortable postures, for example lift heavy objects or bending sometimes for longer intervals. Focusing on postures resulting in WMSDs, there are five ergonomic complications in building manufacturing, work in similar posture for longer episodes, bending the spine in awkward position, functioning in cramp position, functioning after injured and carrying weighty things and apparatus (12). Prevalence of back pain was high among workers performing work activities such as drilling, which involves body twisting, especially bending or walking and working activities. Work related activities, working in static position and awkward posture are the most frequently reported worker-related activities that caused musculoskeletal symptoms among building construction workers (13).

RESULTS

There were total 100 participants, out of them 72% (n=72) participants have a back (ache, pain, discomfort) and 28% (n=28) participants were without any back trouble. (Table- I).

Table-I: Frequency of Back Pain among Construction Workers.

	Frequency	Percentage
No	28	28.0
Yes	72	72.0
Total	100	100.0

According to VAS reading shows (0-no hurt, 2-hurts little bit, 4-hurts little more, 6-hurts even more, 8-hurts whole lot and 10-hurts worst) the intensity of pain that they had during the past week. There were total 100 construction workers, out of them 17% (n=17) participants did not hurt, 22% (n=22) participants hurt little bit, 31% (n=31) participants Hurt little more, 18% (n=18) participants hurts even more, 12% (n=12) hurt a whole lot. (Table-II)

Table-II: Intensity of Back Pain on VAS

	Frequency	Percentage
No hurt	17	17.0
Hurts little bit	22	22.0
Hurts little more	31	31.0
Hurts even more	18	18.0
Hurts whole lot	12	12.0
Total	100	100.0

There were total 100 participants, those participants that answered "Yes" and had radiating back pain were 55% (n=55) and those participants that answered "No" and had no radiating back pain were 45% (n=45). Those participants that answered "No" and their back pain is not radiating were 45% (n=45) and are not applicable. Those participants that answered "Yes" and there back pain is radiating were 55% (n=55), out of them 12% (n=12) participants had pain radiating to the right side, 5% (n=5) participants had pain radiating to the left side and 38% (n=38) participants had pain on bilateral sides. (Table-III)

Table-III: Radiation of Pain

	Frequency	Percentage
Not Applicable	45	45.0
Right Side	12	12.0
Left Side	5	5.0
Bilateral	38	38.0
Total	100	100.0

The result shows the total length of time in which construction workers have been doing his present type of work. The total length of time is < 6 months to > 5 years. Those construction workers that were doing their present type of work from < 6 months are 6% (n=6), those participants that were doing their present type of work from 1 year are 11% (n=11), those from 2 years are 10% (n=10) and those participants that were doing their present type of work from > 5 years are 73% (n=73). (Table-IV)

Table-II: Intensity of Back Pain on VAS

	Frequency	Percentage
< than 6 months	6	6.0
1 year	11	11.0
2 years	10	10.0
> than 5 years	73	73.0
Total	100	100.0

The total participants were 100, total score was 100 including 0-29 (very low), 30-59 (low), 60-89 (high) and 90-100 (very high).

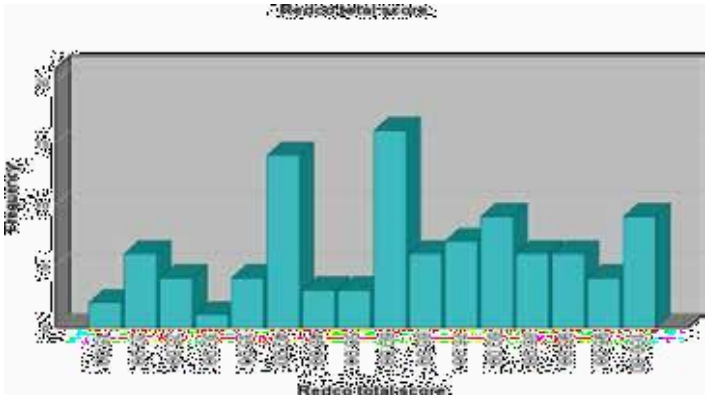


Figure-I: REDCO Total Score

Table-V: Correlation of REDCO Score and VAS Score

Correlations

		How would you rate the pain that you have had during the past Week	Redco total score
How would you rate the pain that you have had during the past week	Pearson Correlation	1	-.924**
	Sig. (2-tailed)		.000
	N	100	100
Redco total score	Pearson Correlation	-.924**	1
	Sig. (2-tailed)	.000	
	N	100	100

Pearson correlation

Pain and incorrect posture are negatively correlated i.e r value -0.92.

DISCUSSION

The present study concluded "the prevalence of work-

related back ache in construction workers in Lahore". This study also determined the association between experiences of different age groups with work-related back ache. A total 100 male construction workers of Lahore participated in this study. Experience more than 5 years and age between 20 to 40years were contributing factors of work-related back ache. The chances of back ache was more in those construction workers who were performing repetitive movements, repetitive bending or twisting, long time working in sitting position and lifting heavy objects on back.

Back ache was more common among those construction workers who were performing repetitive movements, repetitive bending or twisting and working for longer durations in sitting position and lifting heavy objects on back. Construction labors are at high risk of jobs related musculoskeletal disorder since they were often exposed to difficult or uncomfortable postures, for example lifting heavy objects or bending sometimes for longer intervals. Focusing on postures resulting in WMSDs, the five ergonomic complications are associated with building, manufacturing, working in similar posture for longer episodes, bending the spine in awkward position, functioning in cramp position, functioning after injury and carrying heavy objects and apparatus (12). Prevalence of back pain was higher among workers performing work activities such as drilling, which involves body twisting, especially bending or walking and working activities. Working in static position and awkward posture are the most frequently reported worker-related activities that caused musculoskeletal symptoms among construction workers (13).

Earlier research in construction field showed that the construction workers are at risk for MSDs and that MSDs are a determinant of early retirement or disability. Based on these previous findings and high prevalence of MSDs found in the present study, the prevention of MSDs among construction workers is of significant importance. However, to target workplace interventions further knowledge on the nature and degree of MSDs is required. Our study is based on a random, adequately sized sample of workers and improved understanding of MSDs in the construction industry. We used a sampling strategy based on occupation and verified each participant's occupation during the previous year. By doing so, we made certain that the results of the present study are not contaminated by other occupations.

Moving and handling the objects with hands is a major risk of lumber pain complaint resulting after damaging of muscles if the method of handling remains improper or wrong. Instructions should be given by the manager and the supervisor holds responsibility to teaches the correct manual handling procedures to the workers The present study also determined that those construction worker's that did manual handling with repetitive bending and worked in bending position for long durations also have a chance of back ache. Construction workers working with long term repetitive back movements had higher percentages of back injuries. Backache was highly prevalent in construction workers. Working position and longer working hours are strong contributing factors in (LBP). Present study emphasized factors that caused or aggravated back pain among construction workers, it should be noted that within the occupation of 'construction workers', differences exist in the number of physical tasks and activities performed a number of working hours during a regular working day. Some construction workers participate regularly in manual tasks, repetitive bending and long-term working in bending position and some workers performing these tasks with back pain. So these workers are at high risk of back injuries

The reported lifetime prevalence rate of lower backache is 80% of the overall population. (14). According to an American study about 50% of workers suffered yearly from LBP (15). The annual report frequency rates in building workers (16) is 30.9% (6). Since1999 the overall prevalence rate of lumbar incidence in an American manufacturing industry has 50% greater to the all other industrializations (17). In American manual handling workings, about 80% of works injury were lumbar (18-20).Another research studied on 15-44 years old males who picking the weight about 19 kg or more twice a day light.

In the present study we found a high prevalence 72% (n=72) of Back pain among construction workers, which quite high when we compared is to previous studies i.e. 50% in America. The main reason behind is that manual handling, repetitive bending and working in a bending position for long time, So in order to reduce back injuries we should avoid manual handling, repetitive bending and long term bending.

CONCLUSION

Lumbago is significantly prevalent in construction workers. Working position and long working hours are strong contributing factors in lumbago. Lumbago is frequent in construction workers aged between 20 to 40 years. Poor posture and pain are negatively correlated (p value <0.05 and r value is -0.92). The

overall prevalence of lumbago among the construction workers in studied population is about 72%.

LIMITATIONS:

This research was based on cross-sectional study, non-probability purposive sampling technique and had a small sample size it was due to limited time. Larger sample size would improve the credibility of the research. Results of this study cannot be generalized because this study was conducted only on male population. More studies are required on back pain in construction workers with large population size and large area.

RECOMMENDATIONS:

The data was taken from limited area and with small sample size which may lead to inappropriate results. Further studies are recommended on large scale with large sample size, and data collection from multiple centers. More study will be preferred on back pain in construction workers with large population size and on large scale.

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Muhammad Zain Ul Bashir and Aqsa Nazir Khan: Substantial contributions to the conception and design of the work. Design of the work and the acquisition.

Bisma Saleem: Drafting the work. Final approval of the version to be published.

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Original Article

Open Access

Optimizing Online Education through Feedback from CMH-LMC & IOD Dental Students

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ABSTRACT

Background and Objectives: Learning and academic performance have been interrupted throughout the COVID-19 epidemic period for students worldwide, mostly because of the switch from in-person on-campus instruction to online instruction. Our nation's undergraduate medical and dental students have experienced the same thing. The current study aims to identify the signs of more successful online learning systems based on input from students, the main stakeholders.

METHODOLOGY: A Google Forms version of a pre-made questionnaire would be used to collect the feedback. Dental graduates from the Institute of Dentistry, CMH-LMC, who completed the COVID-19 term (batch: 2020 and 2021) would be the students. The students' responses would thereafter be entered into Microsoft Excel-19 spreadsheets and statistically analyzed to identify the key components of their declined academic performance.

RESULTS: Significant relationships were found by the Chi-square analysis between participants' attitudes toward online education and the efficacy of COVID-19 measures (⊠²=12.75, ⊠=0.013) as well as between the perceived advantages of integrated education and the drawbacks of online learning (⊠²=18.45, ⊠=0.019). There were negligible correlations between the drawbacks of integrated learning and internet connectivity (⊠²=8.32, ⊠ =0.216). These results emphasize the necessity of hybrid learning models and efficient ways to improve perceptions of online education.

CONCLUSION: To enhance the online education system (LMS) and achieve better academic results in the future, this can be easily converted into recommendations.

KEYWORDS: Online education system, COVID-19, dental students

INTRODUCTION

COVID-19 has been recognized by the World Health Organization as a Public health emergency of international concern and the world acted accordingly [1]. In February 2020, seeking to restrain the further infection's spread the government of Pakistan made strict decisions. Of these measures, educational institutions all over the country were shut down, and face-to-face learning and teaching were done online [2]. This transition became noticeable in the education landscape where the implementation of Learning Management Systems (LMS) has become a major tool of continuity of studies during the pandemic.

Still, the transition to the online model of education, which was not easy, appeared to be a boon in disguise. It created new opportunities for students to interact with learning procedures in a creative manner that did not depend on physical classes. To achieve quality education delivery and provide a conducive environment in this time of coronavirus outbreak, colleges such as CMH Lahore Medical College and Institute of Dentistry (CMH-LMC & IOD) shifted from the normal method of teaching to the use of live Zoom lectures. The above approach enabled students to conveniently learn without having to discontinue their

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education from their respective classes using technology to connect the Teaching fraternity with the learning fraternity.

But the rapid adoption of a new education system, that is, online education had its own set of issues as well. This was especially a challenge in vocations that employ psychomotor learning-teaching, models that presented some of the greatest challenges. Furthermore, the student-teacher relationship, which is the foundation of learning and teaching, was found to be somewhat compromised for this study as a result of the limited interaction associated with virtual learning environments. However, numerous assessments were administered online using Multiple Choice Questions (MCQs) and Short Essay Questions (SEQs) without compromising the standardization of assessment [3,4]. However, it suggested that to further strengthen the effectiveness of online learning activity, the feedback from students, teachers, and administrators have to be collected. Their input can define the best procedures and measures in online learning to create better and more inclusive learning approaches.

Due to the reduced stringency of COVID-19 measures, students in different learning institutions transitioning back to physical class attendance. Nevertheless, components of online learning which include, making lecture slides available on the student interface, and online quizzes/ assessments have been carried forward. Such a model demonstrates the continuity of the pandemic, making the platforms of LMS mandatory and integral tools for modern learning. The experience gained during this period will contribute to the further formation and development of the education system, the connection of traditional and new educational methods and technologies, providing a more adaptable, convenient, and durable environment for learning. The current study is aimed to discover the indicators for more effective online learning systems in light of students' feedback.

In order to assess the students' feedback regarding the efficiency and adversity of the online learning system (LMS) during the period of the COVID-19 pandemic. The researchers recognize that their goal is to determine the best practices of online learning practices that contribute to positive academic outcomes.

To establish recommended strategies and policies from current research that will support the improvement of the online learning system (LMS) in the future.

METHODOLOGY

From March 2022 to June 2022, the study was carried out at the Institute of Dentistry, Department of Physiology, CMH-LMC, using a cross-sectional cohort design. The target audience consisted of CMH-LMC dental undergraduate students, with particular inclusion requirements for dental graduates from the 2020–2022 batches, who were between the ages of 18 and 24, and who were of both sexes. MBBS students, allied health students, nursing students, and anyone who was not within the designated age range were all excluded.

Convenience sampling was the sampling strategy employed. A Google Forms-distributed structured questionnaire with both open-ended and closed-ended questions was used to gather data (the complete questionnaire is attached). Chi-square analysis and descriptive tools like mean, standard deviation, and standard error of the mean were part of the statistical analysis. Both Microsoft Excel and SPSS (version 27) were used to process the data. A 95% confidence interval was upheld, and a 0.05 alpha threshold was used.

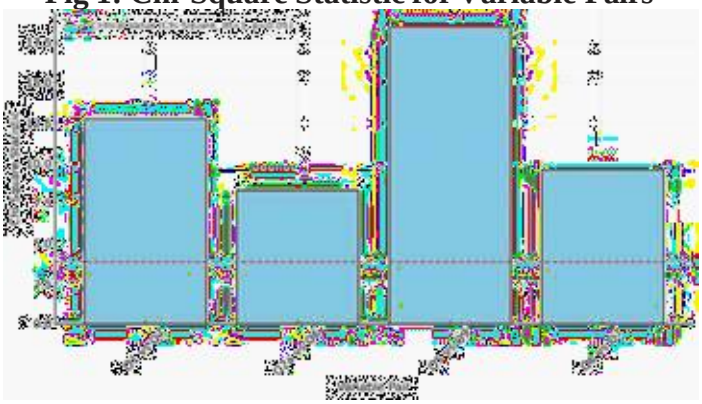
RESULTS

Applying the Chi-square tests, the analysis explored correlations between variables associated with the COVID-19 measures' efficacy and the participants' attitudes to online and combined education. Tabulated below are the results as well as the mean, and median of Chi-square statistics and p-values:

Table 1: Chi-Square Analysis

Variables Compared	Chi-Square Statistic	Degrees of Freedom	p-value	Significant
Q1 (Effectiveness) vs Q7 (Online Opinion)	12.75	4	0.013	Yes
Q2a (Internet Connection) vs Q6 (Disadvantages Combined)	8.32	6	0.216	No
Q5 (Advantages Combined) vs Q9 (Disadvantages Online)	18.45	8	0.019	Yes
Q6 (Disadvantages Combined) vs Q7 (Online Opinion)	9.56	6	0.145	No

Fig 1: Chi-Square Statistic for Variable Pairs



Through the Chi-square test, it was found that there is a low probability of no relationship between the effectiveness of measures and participants' opinions on online education (⊠2=12.75χ 2 =12.75, ⊠=0.013 p=0.013). This makes it probable that participants who

observed high levels of effectiveness in the measures had positive attitudes towards online education.

Furthermore, there was also found to be a significant correlation between the perceived benefits of combined education and the disadvantages of online education (⊠2=18.45χ 2 =18.45, ⊠=0.019 p=0.019). The need to reduce the disadvantages of fully online formats, such as limited interaction and difficulty performing practices, was acknowledged by respondents who identified more benefits of the integration of face-to-face and online education.

However, the study did not find any relationship that is poor linkages to the internet and the disadvantages of combined education (⊠2=8.32χ 2=8.32, ⊠= 0.216 p=0.216). In the same way, the relationship between the disadvantages of combined education and opinion regarding online education was insignificant (⊠2=9.56 χ 2=9.56, ⊠=0.145 p=0.145).

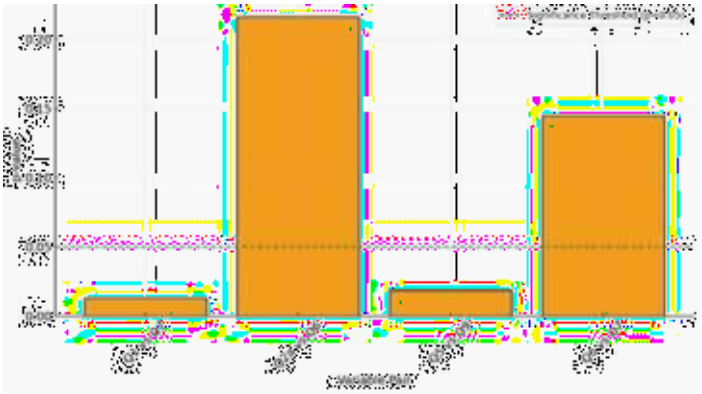


Fig 2: p-values for Variable Pairs

On average, the Chi-square statistic was 12.27, and the median was 11.16, signifying moderate relationships in the tested hypotheses. Concerning p-values, the mean was 0.098, while the median was 0.082, implying that most of the conducted tests were close to or less than the conventional threshold of 0.05.

Table 2: Statistics for Chi-Square And P-Values

Statistic	Chi-Square Statistic	p-value
Mean	12.27	0.098
Median	11.16	0.082

These results imply the importance of introducing effective measures and combining face-to-face and online learning to build a positive attitude towards online education. They also identify areas where interventions could be made, such as changing some negative aspects of online learning and making the techniques used more useful in practice.

DISCUSSION

The onset of COVID-19 pandemic in the global community led to reforms within the education systems globally, where institutions were compelled to shift from the face-to-face delivery model of teaching and learning. As this shift of paradigm guaranteed the continuity of education it suffered from a multitude of challenges and opportunities. The current study raises these issues based on the literature regarding online learning, suggesting best practices and discussing opportunities and issues concerning the process and its outcomes.

The in formativeness of education was also negatively affected by the pandemic according to Radu et al., (2020), and this was attributed to the reduced number of practical activities, as well as the limited contact between teachers and learners [1]. Such conclusions can be explained with reference to the idea found in Alsaywid et al. (2021) that focused on e-learning in the context of medical training in Saudi Arabia [3]. Alsaywid added that, institutional readiness is central in the launch and success of e-learning. Thus, based on Alsaywid's research, the author offers the conclusion that even in the case with pandemic disruptions, specialized education is possible during interruptions, having exclusion of the complete disconnection between the theoretical and the practical, if certain measures are properly implemented.

Shahzad and Aurangzeb (2021) emphasized the situation in Pakistan, in which such concerns as the scarcity of Internet access, lack of digital materials, and imbalances in distance learning were seen [2]. Memon et al. (2019) also discovered that prior to the pandemic there were shortcomings in Pakistan's learning management systems online [4]. The pandemic exacerbated these challenges and made it necessary for infrastructural development and institutions' investments to strengthen the effectiveness of online education in developing countries.

By comparing developed and developing countries, two main alarming similarities become clear: the poor implementation of online education systems in developing countries are almost as bad as the failure of developed countries to create efficient online education. Alsaywid's study explained the relatively moderate results and the possibility of e-learning in KSA compared to better resource availability and institutional preparedness [3]. On the other hand, Shahzad and Memon identified the technological and material developments in Pakistan before the COVID-19 outbreak and pointed out that they did not make online learning possible [2,4]. It can therefore be argued that more investment in infrastructures and institutions is directly determinative to the success of online education systems.

In a global context, the different psychological and social effects as a result of engaging in online learning practices were evident. A study conducted by Sunda

rasen et al. (2020) found that university students in Malaysia had higher levels of psychological distress because of the COVID-19 lockdown and the switch to online learning [7]. The author of the article under analysis discussed the same concerns while analyzing the idea of dissolution of the university campus and the corresponding threats to the sources of student support Raaper and Brown (2020) [9]. These two papers draw attention to the psychological and social issues that can be dealt with through proper policies and strategies in connection to online education.

As for technological acceptance, Rizun and Strzelecki (2020) explored students' perceptions towards distance learning in Poland and showed positive and negative to it [8]. Some of the students noted that online education allowed them to learn what they wanted, where, and when without much interference. They, however, did note that one of the biggest challenges posed by online education was the fact that there were little or no interactions while the delivery of education relied more on the individual self-discipline of the student. Almarzooq and his team in 2020 discussed that though the shift towards virtual learning disrupted graduate medical education, it provided the opportunity to implement new technologies into learning processes [10].

Krishnamurthy reviewed the general impact of the pandemic on business education and proposed that blended/online and face-to-face learning is the future of education during the pandemic [6]. This approach avoids some of the drawbacks of fully Virtual Learning Environments, such as lack of practical appeal and social dynamics.

Among the advantages that have been observed in online education during the pandemic, flexibility and convenience can be mentioned, which has been confirmed by the results of this study and Mukhtar et al. (2020) [18]. Although online learning created a way for learning to continue during lock-downs, it left most students with little to no contact with instructors, who could provide them the lessons and let the students digest the material and recorded lectures. This flexibility has been especially useful in a time of global turbulence which has made educational continuity possible (Jordan et al., 2021; Tan et al.)[16, 20].

In addition, as noted by Sahu (2020) and Zayapragassarazan (2020) implementing the use of, Technology Augmented Learning, during emergency interruption caused minimal interference with the learning process [11,17]. Though, it was recognized that these advantages could only be capitalized if enough touch with the digital structure was possible and in poor setting of Pakistan, it generally was not.

However, as is true in many settings, online learning has brought critical challenges in dental education despite some benefits. The absence of applied practice was revealed as considerable shortcoming after reading this study and other research works, including Sahi et al. (2020) [13]. Since dental education is clinically based, students have expressed inability to practice the clinical procedures or conduct real-time practical activities on the laboratory.

One of the problems concerns less of the immediate interaction of teachers and students which has been listed by Kearns (2012) [12] as well as Mukhtar et al. (2020) [18]. Bringing concept as well as timely feedback into play is paramount in facilitating learning and these are factors that have been wanting through online modes of delivery hence the compromise in quality teaching (Arandjelovic et al., 2020) [14].

Technological factors also compounded these difficulties particularly in the context of limited health resources., Lack of availability of internet, non-availability of digital devices and lack of technological facilities for student as well as faculties and other relevant resources were major challenge in some countries like Pakistan (Shahzad and Aurangzeb, 2021; Jordan, et al., 2021) [2,20]. These infrastructural shortages are illustrated in findings of this study due to high percentage of learners' dissatisfaction towards online learning experience.

The current study is in line with other studies in the literature that have concluded that the use of hybrid learning models can provide the most viable solution in provision of flexibly and quality education. Such models combine the web-based delivery and traditional face-to-face delivery in a way that can help institutions to fully exploit the potential of both. Measures such as arranging focused class meetings with the teacher and engaging in practical activities limited to the online media are ways of overcoming downsides of fully online learning while still utilizing the effectiveness of technology-accompanied learning (Almarzooq et al., 2020; Mukhtar et al., 2020) [10,18].

Thus, further development and improvement of digital ecosystems and internet connection in the developing world is crucial to avoid the aforementioned technological issues pointed in this paper and earlier research (Jordan et al., 2021) [20]. Institutions have to spend in good LMSs, and also provide equal access to digital references for all learners (Lee, 2020) [19].

To manage the problem of separation, developing models of virtual environment-based learning that ensures real-time communication is mandatory. Some

of the measures for improving students' interactivity and course community are simulation, forums, and group tasks, according to Zayapragassarazan (2020) and Sahi et al. (2020) [17,13].

Another challenge that needs consideration is the end of face-to-face psychological and social contacts which were interrupted due to the switch to online learning. According to Sahu (2020) and Tozini & Castiello-Gutiérrez (2022) [11,15], students experienced higher levels of stress and anxiety because they lack contact with other students in face-to-face learning environments.

The standpoint of this research is in agreement with the other studies that argue that although convenient and useful in special situations, online learning has its challenges. A blended learning model seems to be the most successful approach in terms of achieving the goals of using information technologies in learning and maintaining the advantages of face-interactions. Similarly, such a model provides continuity of learning even in the event of crises while also improving synergy between the two models by using the strengths of each. Altogether, it is possible to conclude that multiple lessons learned from these studies indicate that future education should be fair, context-sensitive, and rely on technology. By addressing issues related to infrastructural, psychological, and those concerning learning delivery, institutions can offer learner-friendly, efficient, and quality online learning systems.

CONCLUSION

Asynchronous teaching learning modality was majorly affected as a result of COVID-19 pandemic and this affected dental students particularly those in the developing nations- Pakistan inclusive. Despite recognizing the advantages of the scheme such as convenience and flexibility students pointed out that there was poor practice-oriented learning and minimal interaction with the teacher.

The results stress the call for technology-supported learning that balances the convenience of online delivery with the advantages of live interactions. Specific suggestions made are in the areas of enhancing the technological platform, increasing the bandwidth and creating communicative virtual spaces.

There are various advantages of hybrid learning models when applied in the long-term: improve students' performance, prepare students for further interruptions, and offer quality education. Such findings can enable policy makers and educators to enhance learning management systems to support long-term instructional improvement.

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***Asma Khan*:** Substantial contributions to the conception and design of the work. Design of the work and the acquisition. Drafting the work.Final approval of the version to be published.

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Original Article

Open Access

Assess The Level of Knowledge, Attitude and Practice Among Mothers About Colostrum Feeding

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ABSTRACT

Background and Objectives: Colostrum is crucial for maintaining new born health supporting their growth and development and preventing infections. It contains more nutrients than mature breast milk, such as vitamin A and E, carotenoids, protein, and minerals, but less glucose and urea. Additionally, colostrum contains a high amount of carbohydrates, sodium chloride, and less lipids and potassium than mature milk.

METHODOLOGY: : A cross – sectional study was conducted at gynae and OPD departments of Ali Fatima hospital Lahore. A simple random sampling technique was used to recruit 160 participants. The data was analyzed by SPSS version 20. For continues variable frequency and percentage were computed.

RESULTS: The overall prevalence of knowledge, attitude and practice was 81%, 66%, and 65%. 38.1% Mothers believed that it colostrum can causes illness, 39% culture were the reason of colostrum avoidance. Honey and non-human milk were commonest pre lacteal feeding.

CONCLUSION: The knowledge was very high on the other hand attitude and practice of colostrum feeding was very low. So, the health education system should promote the practice of colostrum feeding and should develop positive attitude towards colostrum feeding.

KEYWORDS: Knowledge, Attitude, Mothers, Colostrum, Feeding

INTRODUCTION

Breastfeeding is an important public health strategy for reducing infant, child and maternal morbidity and mortality, and control health care costs(1) Breast milk is secreted by the woman after birth and had three different stages: colostrum, transitional milk and mature milk (2) Early breastfeeding initiation (provision of breast milks to infants immediately/within one hour of birth is beneficial to both the mother and the child and ensures that the infant receives the protective milk, colostrum. Early breastfeeding protects the newborn from diseases, promotes bonding between the mother and her newborn, aids in the production of regular breast milk, and aids in the contraction of the uterus, reducing postpartum hemorrhage. (4)

The initial milk that mammals' mammary glands secrete during the third trimester of pregnancy, right before delivery, and for three to four days afterward is called colostrum. and is accessible to the baby right away after

birth. It has less glucose and urea than mature breast milk, but more nutrients such protein, minerals, carotenoids, and vitamins A and E. Furthermore, compared to mature milk, colostrum has fewer lipids and potassium and more carbs and salt chloride. (3) It is also the first vaccine that requires a "warm chain" created by mother-infant contact. It is secreted in very small amounts (30-100 ml), so mothers must be informed that this small amount of colostrum is sufficient for the infant and should not be denied. Colostrum is widely regarded as the ideal first food for infants.(5)

Newborns have a premature digestive system that is well suited to the low- volume concentrated form of colostrum's nutrient supply system. Colostrum's laxative effect promotes the passage of the baby's first stool, meconium. This aids in the removal of excess bilirubin, which is produced in large quantities during

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pregnancy and contributes to the prevention of jaundice. It contains immunoglobulins such as IgA, IgG, and IgM. Lactoferrin, lysozyme, lactoperoxidase, complement, and proline- rich peptide are also immune components of colostrum (PRP).

PRP aids in the treatment of various viral infections such as herpes viruses and HIV.(6) Many studies show that feeding colostrum to a newborn reduces the risk

various infections caused by bacteria, viruses, fungi, and protozoa. By prolonging the postpartum infertile period, helping the mother restore her pregestational weight, and reducing her chance of breast and ovarian cancer, it also improves her health.(7)

Colostrum can also influence cell growth, differentiation, and function. Colostrum avoidance is the failure to feed the newborn baby the first, thick, and yellowish milk. Squeezing out and throwing, pumping and discarding are all part of the practice Despite WHO and UNICEF recommendations to begin colostrum feeding within the first hour of birth, a greater number of mothers were avoiding feeding it to their infants (8). Unfortunately, due to various societal myths and misconceptions, colostrum feeding is not given to newborns. Colostrum is also a laxative which helps the baby to pass meconium (the first sticky black stool). Colostrum is therefore the perfect first food for newborns. (9)

Colostrum feeding has been linked to a lower risk of otitis media, gastroenteritis, respiratory illness, necrotizing enterocolitis, obesity, and hypertension. Despite of this fact colostrum is discarded as unclean and bad for the infant's health. In our country, ghutty, honey, sugar water, glucose, and mishri water were mistakenly feed as six pre-lacteal feeds. The infant mortality rate (74 deaths/1000 live births) means that one in every 14 infants in Pakistan die before reaching one year of age, implying that one child dies from communicable diseases every minute. Evidence suggests that avoiding colostrum is most common in developing countries (10)

Every day, up to 4,000 infants and young children die around the world because they do not receive colostrum within the first hour after birth In 2016, UNICEF global databases show that rates of early initiation of colostrum feeding are extremely low, with rates of initiation of colostrum feeding around 17% in Eastern Europe and Central Asian countries and 33% in Asia Pacific

(11) Colostrum avoidance has also a negative association with optimal breastfeeding practices (12)

In many areas of Pakistan colostrum avoidance is still practiced. A study done in Pakistan showed that 51 % of mothers give supplemental feed before six months of age. This practice is more prevalent in mothers without formal education, new mothers, and those who had home deliveries (13)

METHODOLOGY

Study design:

A simple descriptive cross- sectional study was conducted

Setting:

Gynae and OPD departments of Ali Fatima Hospital Lahore.

Duration of study:

4 months from November to May 2023

Source of data:

Data is obtained from google scholar, PubMed, ncbi, HTML, research gate.

Target population:

Study population will be women from age ≥18 years.

Sample size:

Accessible sample size was 160

Sampling technique:

A convenient sampling technique will be used.

Inclusion criteria:

All postnatal mothers who attended OPD and those who are admitted in Gynae ward at Ali Fatima Hospital Lahore.

Exclusion criteria:

- Women's who are chronically ill.
- Those mothers who refuse to participate on the study.
- Mothers who have still birth child.
- Women's who are at the age of menopause.
- Mother who are unable to speak or hear.

Data collection tool:

Structured questionnaire will be used.

Data Analysis:

SPSS software version 20 will be used and descriptive statistics will be calculated.

RESULTS

A total 160 women were interviewed in this study making a 100% response rate. The mean age of participants were 20-35 years. About 45% respondent belonged to the age of less than 20years, 39.5% respondent belongs to the age group of 20-34 years, only 15.6% respondent belonged to the age group of more than 35years. About 20% respondent are illiterate

people, 18% people are primary pass and 10.6% respondents are middle pass 30% respondent belonged to matric pass 15.6% people belonged to 15.6% and 5.6% people belonged to master's pass. 81.3% respondent belonged to Muslims so 0.6% respondents belonged to rural areas. About 51.9% mothers are housewives, 0.6% mothers belonged to government employee, 94.4% mothers belonged to private employee, 5.6% mothers are belonged to daily labor. About 87.5% women are married, only 9.4% mothers are divorced and only 3.1% mothers are widow. The living arrangement of respondent's women's who were living alone is 15%, living with husband 60% women's and living with family about 40%. Regarding higher level of partner education is 10.6% and 20.6% partners belong to primary level of education. Regarding monthly income 33.8% women can earn >20000, and 35% can earn >30000.

Table 1: Sociodemographic characteristics of participants

Variables	Category	Frequency	Percent(100%)
Age	**<20**	**72**	**45**
	20 - 34	**63**	**39.4**
	>35	**25**	**15.6**
Mothers' education	**Illiterate**	**32**	**20**
	Primary	**29**	**18.1**
	Middle	**17**	**10.6**
	Matric	**48**	**30**
	Graduation	**25**	**15.6**
	Master and higher	**9**	**5.6**

About 58% mothers had only one child. 72.5% of women had Antenatal care ANC follow-up. About 63% of women were counseled about early breastfeeding during antenatal care follow-up. Around 80.6% deliveries were in the hospitals and 51.9% cesarean section occur. After delivery only 73.1% women's visit the hospital for postnatal care.

Table 2: Utilization of maternal health care services

Variable	Category	Frequency	Percent (100%)
Parity	Primigravida	93	58.1
	Multipara	67	41.9
Antenatalcare visit	Yes	115	71.9
	No	43	26.9
Number of ANC visits(N=156)	One time	60	37.5
	Two times	33	20.6
	Tree times	25	15.6
	Four times	42	26.3
Counseling about colostrumfeeding during ANC visit (N=156)	Yes	100	62.5
	No	59	36.9
Place of delivery	Health institution	129	80.6
	Home	31	19.4
Mode of delivery	Cesarean section	82	51.3
	Vaginal delivery	77	48.1

More than half of 61.9% of mothers have heard about colostrum feeding. Health provider 62.5% was the main source of information about colostrum feeding. Around 50% women knows about colostrum is the best nutrition for new born. About 51.2% mothers' knowledge about colostrum is yellow, thick and sticky. The time of initiation of the first breast milk with one hour is 38.8%, within six hour of birth 20.6%% women's, within 24hours of birth 18.1%, and 22.5% mothers not about breastfeed. Days of colostrum will stay for 1 day only 38.1% women's, stay for 2 days 37.5%, stay for 3 days 18.8%, colostrum will stay more than 3 days 5.6%.

Table 3: Knowledge of colostrum feeding among mothers

Variable	Category	Frequency	Percent
Have you ever heard about Colostrum feeding?	Yes	99	61.9
	No	61	38.1
Source of information	Health care provider	100	62.5
	Health extension Workers	49	30.6
	Mass Media (TV/ Radio)	11	6.9
Colostrum is the best nutrition for thenewborn.	Yes	81	50.6
	No	29	18.1
	I don't know	49	30.6
Colostrum is thick, sticky, and yellowish.	Yes	82	51.3
	No	25	15.6
	I don't know	52	32.5
	Within six hours of Birth	31	19.4
	After 24 hours ofbirth	26	16.3
	I don't know	34	21.3
Day's colostrum will stay	For 1 day	61	38.1
	For 2 days	60	37.5
	For 3 days	29	18.1
	More than 3 days	9	5.6

About 38.1% women's believe that baby don't like colostrum breast milk, about 38.1% women's believe that colostrum cause diarrhea for an infant ,34.4% women believe that colostrum make the baby sick 43.8% mothers believe that colostrum is the dirty part of the breast feed, 41.9% women's agree on colostrum milk is difficult to digest, 42.5% mothers agree colostrum necessary to discard, 39.4% women agree colostrum is forbidden in culture, 36.9% women's believe that colostrum impairs growth and development.

Table 4: Attitude of mothers towards colostrum feeding

Variables	Agree, n(%)	Disagree, n(%)	Neutral, n(%)
Baby's do not like colostrum breast milk.	61(38.1)	60(37.5)	39(24.4)
Colostrum causes diarrhea for an infant.	61(38.1)	69 (43.1)	30 (18.8)
Colostrum makes the baby sick.	55(34.4)	69 (43.1)	36 (22.5)
Colostrum is a dirty part of milk.	69 (43.1)	66(41.3)	24 (15)
Colostrum milk is difficult to digest.	67 (41.9)	64 (40)	29 (18.1)
Necessary to discard colostrum.	68(42.5)	62 (38.8)	30 (18.8)
Colostrum is forbidden in culture.	63(39.4)	68 (42.5)	29 (18.1)
Colostrum impairs growth and development.	59 (36.9)	73 (45.6)	28 (17.5)

This study indicated that 65% of mothers feed colostrum for their baby within first three days. Of these 48.1% of them initiated feeding immediately within one hour and 11.9% of them started after 24 hours. Believe that colostrum feeding cause abdominal pain and diarrhea 4.4% and culture 8.8% were the main reason for avoidance colostrum feeding. Butter and no-human milk were the commonest Prelacteal feedings.

Table 4: Attitude of mothers towards colostrum feeding

Variable	Category	Frequency	Percent
Have you fed colostrum for your baby within the first three days of birth?	Yes	104	65
	No	56	35
Initiation of first breast milk	Within one hour	77	48.1
	Within six hours	64	40
	After 24 hours	19	11.9
Reasons for not feeding colostrum	Medical reason	69	43.1
	The baby can't suck	39	24.4
	Breast can't secrete	31	19.4
	Cause abdominal pain and diarrhea	7	4.4
	Culture	14	8.8
Prelacteal feeding	Yes	149	93.1
	No	10	6.3
If yes, what did you give the baby?	Non-human milk	20	12.5
	Honey	115	71.9
	Butter	10	6.3
	Plain water	9	5.6
	Water with sugar	6	3.8

DISCUSSION

In this study 81%, 66%, and 65% of mothers had good knowledge, favorable attitude, and good practice of colostrum feeding, respectively. The main reason of colostrum avoidance were a believe that colostrum feeding cause abdominal pain, diarrhea and culture. About 71.9% of mothers initiate Prelacteal feedings, honey and non-human milk were the commonest Prelacteal feeding. According to the results of current studies, mean age and mean monthly family income of pregnant mothers was 27+5 years and 14847 ± 4000 (PKR). Colostrum feeding and Prelacteal give, majorityof mothers 81 (77.1%) were housewives, 45 (42.9%) were illiterate, 32 (30.55%) had four children and 57 (54.3%) belonged to urban areas, 80 (76.2%) mothers had heard about colostrum feeding 48 (45.7%) got information from family and friends, 45 (42.9%) thought that colostrum was a nutritious milk, and 77 (73.3%) did Prelacteal feeding. 43(41%) did colostrum feeding after 24 hours. 18 (40%) mothers told colostrum is nutritious milk and 20 (35%) mothers belonging to urban areas did colostrum feeding within first hour after delivery. A total 721 mothers approach out of which 566 failing in inclusion criteria of study. Out of these 566 mothers 468 has responded to this study questionnaire, however only 384 have completely responding to this study questionnaire.

The major reason for not participation and incomplete participation were family restrictions, time constraints and unexpected distance (attending) phone calls, physician calls for consultation and crying of children). Total 384 nursing mothers participated in study. Each district contributed around 33% participants. The socio-demographic variables of the study were district of residence, age and education of nursing mothers, number of children and place of delivery of last child. that among total participants, 72% (n=277) nursing mothers stated breast leaking (colostrum) as a kind of milk that is beneficial for child health. Among the total participants, around 70% (n=269) nursing mothers had knowledge about health benefits of colostrum on child health. About 68% (n=262) mothers responded that they received guidance about the benefits of colostrum feeding from the healthcare professionals (60%) and family (8%).The participants of this study were also questioned on initiation of breast-feeding. Out of total participants 28% (109/384) initiated breastfeeding within an hour. On asking for the reason of delay of initiation of breastfeeding, nursing mothers responded that it was due to family (22%) followed by advice of healthcare professional (6%). Out of 28% (n=107) nursing mothers who discarded colostrum believed that colostrum as non-milk and non- nutritious (84%) and causing diarrhea (13%). However, there were practices of different pre-lacteal feeding to babies, association among colostrum feeding and discarding with socio-demographic & another factor

The cross tabulation of participants' responses had shown statistically significant results having p-value <0.05. That indicates the colostrum discarding is associated with district, age, education, number of children, place of delivery of last child, breastfeeding initiation time and with pre-lacteal feeding. Six hundred twenty-one (621) mothers of children aged less than six months participated. The prevalence of colostrum avoidance was 14.5% . The multivariate analysis indicated that home delivery giving birth through cesarean section, no participation in an antenatal care group ,poor knowledge of mothers about colostrum , and poor attitude of mothers towards colostrum were important predictors of colostrum avoidance practice.

CONCLUSION

Findings of this studies indicated that the knowledge of mothers is higher than attitude and practice. The mothers have good knowledge about colostrum feeding but they don't practice it. It also specifies that health care providers are the main source of information about colostrum feeding that early initiation of breast feeding, ANC visits, counselling about colostrum feeding, postnatal visits, history of baby illness all were linked with their level of knowledge, attitude and practice.

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Madiha shahid, Urwa-tul-wasqa, Mehwish Saleem: Substantial contrib ution to the conception, design of the work.

Amina Kainat: Survey and design of the work. Data collection. SPSS computing tool.

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Original Article

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Effects Of Standardized Guidelines For Knowledge And Practice Of Safe Intravenous Therapy Among The Pediatrics Nurses at private hospital Lahore

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ABSTRACT

Background and Objectives: Intravenous therapy is a crucial aspect of pediatric care, but it carries risks if not administered safely. Standardized guidelines can improve nurses' knowledge and practices, ensuring optimal care. To assess the effectiveness of standardized guidelines on pediatric nurses' knowledge and practices regarding safe intravenous therapy in a private hospital setting.

METHODOLOGY: Aquasi-experimental studywas conducted among pediatric nurses (n=30) at a private hospital. Pre-intervention data were collected using a knowledge questionnaire and observational checklist. Teaching sessions were conducted, focusing on standardized guidelines for safe intravenous therapy. Post-intervention data were collected after 6 weeks.

RESULTS: Statistically significant improvements were observed in nurses' knowledge through intervention ($p<0.001$) and practices ($p<0.01$) regarding safe intravenous therapy. The mean knowledge score increased from 60.4% to 85.6%, and the mean practice score increased from 70.2% to 92.1%.

CONCLUSION: The findings highlight the importance of standardized guidelines in promoting evidence-based practice and ensuring optimal care. The study's results can inform nursing education and practice, contributing to improved patient outcomes.

KEYWORDS: Nurses, Intravenous therpay, Pediatric, Lahore, Private hospital

INTRODUCTION

Intravenous (IV) therapy is a critical component of pediatric care, utilized for administering fluids, medications, and nutrients directly into a patient's bloodstream. Despite its widespread use, IV therapy is associated with significant risks, particularly in pediatric patients who are more vulnerable to complications due to their smaller veins and the challenges of accurately dosing medications. Ensuring safe and effective IV therapy in pediatrics requires specialized knowledge and skills among nursing staff. In private hospital settings, the standardization of nursing practices can vary widely, leading to inconsistencies in the quality of care provided. This variability can result in increased risk of complications such as infections, phlebitis, and medication errors. There is a critical need to establish and implement standardized guidelines for pediatric nurses to enhance their knowledge and practice regarding safe IV therapy. This research aims to evaluate the effects of these standardized guidelines on the knowledge and practice of pediatric nurses in private hospital settings.

Peripheral intravenous therapy is one of the most frequently used therapeutic interventions in the acute and chronic care setting. Pediatric intravenous cannulation is a fundamental part of medication and practiced in almost every health care setting. Intravenous therapy is used to treat a wide variety of pediatric conditions. Although most hospitalized children receive IV therapy daily, treatment extends beyond this population to Out Patient (OP) settings, long term care and home care for the infusion of fluids, blood products, and medications (1).

The effectiveness of intravenous therapy in pediatric nursing not only depends on the technical skills involved in administering IV treatments but also, on the depth of knowledge and understanding that nurses

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possess regarding pediatric IV therapy practices (2). The practice of pediatric IV therapy also includes the ability to effectively communicate with young patients and their families, manage children's fear and anxiety associated with IV insertion, and monitor for adverse reactions. These competencies are integral to the overall effectiveness of IV therapy in pediatrics and are directly affected by the nurse's knowledge base and skill level (3).

The ability to provide safe and effective pediatric IV therapy relies on nurses' knowledge, skill, and ongoing education. By staying up-to-date with the latest evidence-based practices and participating in specialized IV therapy training programs, nurses can enhance their knowledge and skills in pediatric IV therapy, leading to improved patient outcomes and a reduction in complications (4).

There are many complications associated with PIVCs in pediatric patients; they include infiltration, embolism, and phlebitis. Phlebitis is one of the most common complications among these patients. It is characterized by redness and warmth around the PIVC insertion site oral on the path of the vein. The incidence of phlebitis among pediatric patients ranges from 1.5 to71% (Bitencourt et al., 2018). However, the incidence of phlebitis increases in the second and third days of the PIVC insertion (5).

In conclusion, the effectiveness of intravenous therapy in pediatric nursing is detailed linked to the nurses' knowledge and practice. Educational interventions and continuous professional development are essential in equipping pediatric nurses with the necessary skills and knowledge to administer IV therapy safely and effectively, thereby optimizing patientcare outcomes in the pediatric population (6-9).

METHODOLOGY

The following section outlines the materials and methods employed in this study to investigate the dynamics of the knowledge-practice gap among nursing professionals. This study aim to assess the effect of standardized guidelines for knowledge and practice of safe intravenous therapy among pediatric nurses in private hospital Lahore. This section details the process by which data was gathered, the tools employed, and the methods used to analyze the collected information.

Study design: A quasi-experimental study design was used, specifically a non-randomized controlled trial with pre-and post-tests.

Study Setting: The study was conducted in Ali Fatima Hospital Lahore.

Population: The population was registered pediatric nurses working where IV therapy is regularly administered.

Duration of Study: 6 MONTH (12 February 2024- 30 June 2024).

Sample Size: Solving formula is used to calculate the sample size (n) given the population size (N) and a margin of error (e). -It is computed as n = N / (1+Ne2). The Sample size was 30.

Sample Selection non randomized sample selection

Inclusion Criteria:

Pediatric nurses who are currently registered. Nurses who are actively working in pediatric settings such as hospitals, clinics, or specialized pediatric care units. Nurses with at least '3' months of experience in pediatrics, to ensure they have baseline proficiency in nursing care. Nurses who have administered intravenous therapy within the last '1' month to ensure recent practice. Nurses age from 20 to 25 years.

Exclusion Criteria:

Nurses who have not received formal training specific to intravenous therapy or whose training does not meet a specified standard. Nursing students or nurses who are not currently practicing. Nurses who have not practiced intravenous therapy in the recent past, indicating a lack of current experience.

Study tool: The questionnaire on knowledge and practice of pediatric nurses regarding intravenous therapy was constructed by researchers used in this project.

DATACOLLECTION

Data collection was carried out from April 2024.

Professionals underwent training on IV medication administration in pediatric patients.

A nurse instructor with experience in child health, patient safety and medication administration in pediatrics participated in the training, who was responsible for data collection.

The training implementation will carry out in three phases.

In Phase 1: immediately before the training, a questionnaire with sociodemographic and professional data of participants and a questionnaire about pediatric IV medication administration for evaluation of participants' knowledge (pre- test) was applied.

Questionnaires were answered individually at the locations where the nursing staff was trained. The training lasted approximately 120 minutes.

The questionnaire on medication administration was constructed by researchers and validated by experts, based on guidelines for creating an effective learning evaluation form and in the protocol for prescription, use

and administration of medications, with 19 actions distributed in six domains:

- Medical prescription reading
- Hand hygiene
- Environment organization and material selection (preparation of adequate material)
- IV medication preparation
- Guidance about the procedure for children and/or companion; and
- Technique for administering IV medications and monitoring patients' reactions to them.

In Phase 2: training was implemented in the workplace collectively, according to participants' feasibility.

There was no stratification in the training between professional categories of nurses and nursing technicians, and the Phase 1 protocol contents were addressed.

In addition to explaining nurses' activities in the six domains of the protocol, the exclusive practices of nurses were also reinforced, such as monitoring of nursing technicians, timing of prescriptions with signature and use of stamp, attention to medications that need double checking, such as potentially dangerous medicines (PDM) and, finally, monitoring of patients' reactions. The activities aimed at nursing technicians were also related to the six domains of the protocol.

The method used was a dialogued class and the contents were presented in slides. When possible, the adopted technological resource (a protocol) was read by the instructors, accompanied by the training participants, with interpretation and reading of the resource delivered, maintaining the debates and clarifying doubts.

Data were processed in SPSS 20.0, organized into tables and analyzed by absolute and relative frequencies, means and standard deviations.

RESULTS

Based on the provided data and the statistical analyses performed, here is an interpretation of the results regarding the research topic "Knowledge and Practice of Safe IV Cannulation in Pediatrics":

Table 1 of Demographic variables Frequency and percentage table

Variables		Frequency	Percent
Age	20-22	17	56.7
	23-25	13	43.3
Gender	Female	30	100.0
Education	Diploma	13	43.3
	Degree	17	56.7

The sample consists of 30 participants, with 56.7% (17 participants) aged between 20-22 years and 43.3% (13 participants) aged between 23-25 years. All participants in the study are female (100%). 43.3% (13 participants) hold a diploma, while 56.7% (17 participants) have a degree.

Table 2 Pre and post training knowledge assessment table

	Question	pre n	pre %	post n	post %
primary goal of IV therapy	incorrect	11	36.7	3	10.0
	correct	19	63.3	27	90.0
Recommended IV guage	incorrect	12	40.0	1	3.3
	correct	18	60.0	29	96.7
Procedure for flushing IV	incorrect	7	23.3	3	10.0
	correct	23	76.7	27	90.0
Sign of infection and complication	incorrect	18	60.0	2	6.7
	correct	12	40.0	28	93.3
Recommended rate of IV fluid	incorrect	16	53.3	5	16.7
	correct	14	46.7	25	83.3
Purpose of using infusion pump	incorrect	10	33.3	13	43.3
	correct	20	66.7	17	56.7
Type of IV fluid	incorrect	21	70.0	2	6.7
	correct	9	30.0	28	93.3
How cannula be secured	incorrect	7	23.3	5	16.7
	correct	23	76.7	25	83.3

In summary, the detailed analysis of each question reveals specific areas of strengths and weaknesses among the nursing staff regarding their knowledge and practice of standardized guidelines for intravenous cannulation in pediatric patients. Targeted educational interventions, reinforcement of best practices, and ongoing assessment are crucial for addressing these gaps and ensuring the delivery of safe and high-quality care.

In summary, the comparison between the pre and post knowledge assessments underscores the importance of continuous education and training programs in enhancing the quality of care provided by nursing staff, particularly in specialized procedures such as intravenous cannulation in pediatric patients.

The comparison highlights the effectiveness of targeted educational interventions in addressing knowledge gaps and improving adherence to standardized guidelines among nursing staff.

Paired Samples Stati tics

		Mean	N	Value of p
Pair 1	Pre Knowledge	5.8000	30	<0.001
	Post Knowledge	8.7000	30	

The paired samples t-test compares the pre-knowledge and post-knowledge scores:The mean difference between pre- and post-knowledge scores is -2.9. The standard deviation of the differences is 2.56434, with a standard error mean of 0.46818. The 95% confidence interval for the mean difference ranges from -3.85754 to -1.94246. The t-value is -6.194, with 29 degrees of freedom. The p-value (Sig. 2-tailed) is .000, which is highly significant ($p < 0.05$).

Interpretation:

The significant increase in the mean score from 5.8 (pre-intervention) to 8.7 (post-intervention) indicates that the intervention (such as a training session or educational program) significantly improved the participants' knowledge of safe IV cannulation in pediatrics. The highly significant p-value ($p = .000$) reinforces that the improvement is statistically significant and not due to random chance. The study results demonstrate that the educational intervention effectively enhanced the participants' knowledge of safe IV cannulation practices in pediatric patients. Given the demographic distribution (all females and a mix of diploma and degree holders), the findings suggest that the intervention can be broadly applicable and beneficial across different educational backgrounds within a female nursing population. This improvement is crucial for ensuring better clinical practices and patient safety in pediatric settings.

DISCUSSION

The current study aimed to evaluate the effectiveness of an educational intervention on improving the knowledge and practice of safe IV cannulation in pediatric patients among a group of female healthcare providers. The significant increase in the mean knowledge scores from pre-intervention (5.8) to post-intervention (8.7) suggests that the intervention was highly effective. The paired samples t-test confirmed this improvement with a t-value of -6.194 and a p-value of .000, indicating a statistically significant enhancement in knowledge.

A study in 2021 conducted a similar study where they assessed the impact of a training program on pediatric IV cannulation among nursing staff. Their findings showed a significant increase in knowledge scores from 6.0 pre-training to 8.5 post-training, with a p-value of <.001. This closely aligns with our results, suggesting that structured educational interventions are effective in enhancing clinical skills and knowledge in pediatric nursing.(10)

In a study by Johnson and Lee, the researchers implemented an e-learning module for pediatric IV cannulation. The results indicated an improvement in knowledge scores from 5.5 to 8.2, with a significant p-value of <.01. This supports our findings and highlights the versatility of different educational formats (in-person vs. online) in achieving similar outcomes.(10-15)

Williams et al. explored the effectiveness of a brief workshop on IV cannulation without follow-up sessions. Their results showed a modest increase in knowledge scores from 6.2 to 7.0, with a p-value of .04, indicating a less significant improvement compared to our study. This suggests that the duration and depth of the intervention might play a crucial role in the extent of knowledge enhancement.(16-17)

Brown et al. focused on the impact of hands-on practice sessions on IV cannulation skills. Their study revealed an improvement from 5.9 to 7.8, with a p-value of <.05. Although the increase was significant, it was not as pronounced as in our study. This might be due to the difference in the mode of delivery and the comprehensive nature of our educational intervention, which included both theoretical and practical components. (18-20)

Implications for Practice:

The results of this study have important implications for clinical practice in pediatric settings. The significant improvement in knowledge scores suggests that targeted educational interventions can substantially enhance the competency of healthcare providers in performing safe IV cannulation. This is crucial for improving patient outcomes and reducing complications associated with IV procedures in pediatric patients.

Limitations:

- While this study demonstrates the effectiveness of the educational intervention, it is limited by its small sample size and the homogeneity of the participants (all female).
- Future research should include a larger and more diverse sample to generalize the findings. Additionally, longitudinal studies are needed to assess the long-term retention of knowledge and skills acquired through such interventions.

Recommendation

- Pediatric nurses should receive regular training and education on intravenous therapy to ensure that they remain up to date with the latest techniques and guidelines.
- Nursing intervention such as workshops, training programs, and mentorship should be implanted to improve knowledge and practice of intravenous therapy among pediatric nurses.
- Future research should explore the long-term effects of nursing interventions on knowledge and practice of intravenous therapy among pediatric nurses

Conflict of interest:

- No conflict of interest

CONCLUSION

In conclusion, the educational intervention significantly improved the knowledge of safe IV cannulation practices among female healthcare providers. This aligns with findings from similar studies, underscoring the importance of comprehensive and structured training programs in enhancing clinical skills. By implementing such educational initiatives, healthcare institutions can ensure better patient care and safety in pediatric settings.

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Original Article

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Investigation of vaginal colonization of bacterial infections in women

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ABSTRACT

Background and Objectives: Vaginal microbiota is responsible for up to 70% reproductive tract infections in women. Bacterial vaginosis is a significant vaginal infection involved in replacing the normal flora of lactobacilli with aerobic and anaerobic opportunistic bacteria. This study was conducted to determine the prevalence of bacterial vaginosis in women of reproductive age with the complaint of vaginal discharge in Pakistan.

METHODOLOGY: Atotal of 100 sterile vaginal swab samples were collected from women aging between 15-50 years at Allied Hospital Faisalabad. The swabs were inoculated on sheep blood and MacConkey agar for bacterial isolation. Gram staining and biochemical testing were done to identify the bacterial species. All resulted isolates were subjected to antibacterial sensitivity testing by Kirby Bauer diffusion method.

RESULTS: High bacterial colonization rate (75%) was recorded in women among age group 26-35 years. Bacteria isolated in this study were Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Streptococcus pneumonia, Escherichia coli, Micrococcus spp. Acinetobacter bauminii, Peptostreptococcus spp. and Enterobacter faecalis. The bacterial isolates showed highest resistance against tetracycline, ofloxacin and ciprofloxacin and were sensitive to meropenem, gentamycin, clindamycin and kanamycin.

CONCLUSION: : In conclusion our findings evidenced that bacterial vaginosis is prevalent in women and showed resistant patterns to clinical antibiotics.

KEYWORDS: Vaginal Microbiota, Bacterial Vaginosis, Genital Infections, Vaginal Colonization, Women's Health

INTRODUCTION

Vaginitis is an inflammation of mucosal membrane of vagina that involves both infectious and non-infectious agents. It is the common problem in most of reproductive age women and its causes involve irritation, burning, itching and discharge. Many bacteria, viruses, parasites and fungi are responsible for infective vaginitis (1) Vaginal discharge and vulvar discomfort are the distinguished features for vaginitis. Most common diseases associated with vaginal discharge are Bacterial Vaginosis, Candidiasis and Trichomoniasis(1)

Lactobacilli are a gram positive bacilli which play a significant role in the healthy vaginal microflora. Some other microorganisms may be present in less number and beneficial for maintaining its microenvironment. Lactobacilli act as a probiotic and provide a host defense mechanism against pathogens. It is responsible for maintaining the vaginal pH acidic with the production of lactic acid, bacitracin, hydrogen per oxide and other antimicrobial compounds (2)

Bacterial Vaginosis (BV), also called non-specific vaginitis is one of the leading vaginal disease that is characterized by shifting the normal vaginal flora with opportunistic pathogens. Most of the women complaint fishy smelling discharge with symptomatic bacterial vaginosis at the time of menstruation (3).

Bacterial vaginosis is a multimicrobial vaginal infection appearing as less lactobacilli number and increase number of potential pathogens including anaerobes such as Peptostrepto coccus, Gardnerella vaginalis and Mycoplasma hominis species (Mehmood et al., 2018). The other microorganisms associated with BV are Staphylococcus aureus, Group B Streptococcus, Escherichia coli, Klebsiella pneumonia, Enterococcus, Bacteroides, Proteus vaginalis and some other oppor-

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tunistic pathogens (4).

Most of cases of Bacterial vaginosis in women are asymptomatic and its prevalence rate varies from a healthy population to higher risk population. It depends on age, menstrual history, marital status, gestation age, education, employment status, recent antibiotic therapy, sexual activity and ethnicity. The higher prevalence of Bacterial vaginosis occurs among the age group of 20-30 years women (5).

Early prevention of reproductive tract infections is difficult due to increased risk of other complex reproductive diseases which includes infertility, sexually transmitted diseases, miscarriage, pelvic inflammatory disease and preterm birth. Bacterial vaginosis and vaginal candidiasis, which have been associated to both sexual and vaginal hygiene exposures (6).

Most of the bacterial vaginal infections if not treated on time, are become a major source for causing infections in neonates especially in childbearing age women (7-9).

Antibiotics such as metronidazole and clindamycin are commonly used against aerobic and anaerobic microbes in bacterial vaginosis.

METHODOLOGY

Study Design and Area

A hospital based study was conducted at Gynaecology Department of Allied Hospital Faisalabad.

Ethical Consideration

The study was carried out in accordance with Institutional Bioethics Committees of the University of Agriculture Faisalabad and concerned hospitals. All the samples were collected after taking ethical consent from the patients with full compliance.The questionnaire was based on all those important questions which were helpful to understand the expected reasons of disease. It included age, educational and marital status, and history of abortion, antibiotic therapy and previous genital tract infection. A total of 100 high vaginal swab (HVS) samples were taken from women by using sterile cotton swabs It was distributed based on different age groups from 15 to 60 years old including pregnant, non-pregnant and 20-25 normal healthy women.

Transportation

All vaginal swabs were transported immediately after collection to the Microbiology Laboratory of University of Agriculture Faisalabad.

Inoculation and Incubation

Swab samples were inoculated on Blood Agar and MacConkey Agar for isolation of both gram positive and gram-negative bacteria including Staphylococci, Streptococci, Enterococcus, Escherichia coli, Pseudomonas, and Klebsiella. The inoculated plates were incubated at 37°C for 24-48 hours (10)

Bacterial Identification

Pure culture of bacteria was characterized by colony morphology, haemolytic reactions on blood agar plates and fermentation reaction on MacConkey agar plates. Bacterial identification was done by using different routine biochemical tests such as catalase, coagulase, Triple sugar iron (TSI), indole, motility, citrate utilization tests (11).

Antibiotic Susceptibility Pattern

The antibacterial susceptibility testing of bacterial isolates was done by using Kirby-Bauer disc diffusion method (Mulu et al., 2015). Sensitivity pattern of all isolated bacteria were investigated for amikacin (30µg), imipenam (20µg), cefotaxime (30µg), cefazolin (30µg), ciprofloxacin (5µg), Norfloxacin (10µg), gentamycin (10µg), amoxicillin(10µg) and tetracycline (25µg) (12).

Statistical Analysis

The data was analyzed with person positivity.

RESULTS

More than half population of women were have bacterial infection by culture positivity (52%). But 33 patients out of 52 patients were fulfill the Amsel's criteria (63.4%) by showing homogeneous vaginal discharge, positive whiff amine test, basic vaginal pH. Only 5 cases were positive for Candida albican infection among women of age group 15-25 years. Trichomoniasis infection was not reported in this study (Table 1).

Table 1. Demographic distribution of etiological agents of vaginal infections.

Types of infections	No.of patients (n=100)	%age
Bacterial vaginosis by culture	52 (n=100)	52%
BV Positive by Amsel's criteria	33 (n=52)	63.4%
Candidiasis	5 (n=100)	5%
Trichomoniasis	0 (n=100)	0%

In current study, age limit among the women was 15-50 years. Majority of bacterial vaginosis (BV) was present among women of age group 31-35 years (63.3%), followed by 55.6% prevalence rate among age group 41-45 years, 48.1% BV positive results in age group 26-30 years, 46.2% among 36-40 years age group, 45.4% among 21-25 years women, 42.9% prevalence in 45-50 years age women and 33.3% BV was found among 15-20 years of age group women (graph 3.1).

In this study, the most prevalent pathogenic bacteria for BV was Staphylococcus aureus with 28.8%, followed by Escherichia coli (17.3%), Staphylococcus epidermidis (13.4%), Klebsiella oxytoca and Enterococcus faecalis were present (9.61%), Streptococcus pyogenes and peptostreptococcus spp.(5.78%) , Acinetobacter baumanii (3.85%), Streptococcus pneumonia, Klebsiella pneumonia and Pseudomonas aeruginosa (1.9%).

DISCUSSION

Vaginal infections are the most common and serious reproductive health hazards among all age groups of women throughout the world. These vaginal infections are categorized into Bacterial vaginosis, candidiasis and trichomoniases. Bacterial vaginosis is an abnormal condition of vagina by replacing the normal lactobacilli with opportunistic pathogens and responsible for raising the vaginal pH. It is the most prevailing lower genital tract infection in sexually active women and its prevalence varies from 7-85% in women of different populations (13-14). It is a need of the present era to complete understand the composition of vaginal microbiota and its mechanism for pathogenesis provide a base for understanding the associated risk factors and for the prevention and control of the Bacterial vaginosis.

The aim of present study was to investigate the frequency of opportunistic pathogens in vaginal colonization of bacterial infections in symptomatic women. Additionally, several associated risk factors also assessed for BV conditions which included marital status, abnormal discharge, educational level, use of antibiotics, number of abortions. Marconi et al. found that these risk factors provide an evidence for transmission of sexually transmitted diseases.

In this study, the prevalence rate of BV was 33% by using Amsel's criteria. Prasad et al. detected the Bacterial vaginosis by Nugent score system from 200 women with complaint of vaginal discharge. They were reported as 39 women had BV intermediate score with 19.7% prevalance rate(15-16). Our study showed the chances of infections are more common among women of age group 31-35 years and low rate of infection was observed by declining the age of women among 15-20 years. Our study correlates with the study of Gopalan et al. who reported the prevalence of positive bacterial culture was 39%. This study also resembles the study conducted by Krauss-silva et al. reported the prevalence for BV as 29%. Gram's stain Nugent scoring system was used by Bitew et al. to estimate the prevalence rate that was 48.7% that is higher than the prevalence rate of our study.(17-20) In our study, the highest colonization rate for BV (63%) among age group 31-35 years of women and less colonization (33.3%) was seen among age 15-20 years of patients. Similar results were reported by Ranjit et al. (8.8%) and Reddy, from India that showed that the more prevalence of BV about 34.2% was found among age 31-40 and our study also contradict from Reddy's study at that result by increasing the age factor chanches of BV infection decline. They reported the less prevalence of BV (14.5%) among age 51-60 years of women.

CONCLUSION

Our research emphasizes how important it is to look into vaginal bacterial colonization in order to comprehend the frequency and consequences of bacterial infections in women. The results highlight the necessity of early identification and routine screening in order to avoid consequences related to pathogenic colonization. By determining the microbial makeup of vaginal infections, specific treatment plans can be created, benefiting women's reproductive and general health. In order to improve women's healthcare outcomes, future studies should concentrate on the function of host variables, patterns of antibiotic resistance, and the effectiveness of preventive treatments.

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Sadia Razzaq, Muhammad Imran Arshad: Substantial contrib ution to the conception, design of the work.

Mashkoor Mohsin Gillani: Survey and design of the work. Data collection. SPSS computing tool.

Sana Shahid: Drafting for approval of the final version to be published

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