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Original Article

Development of herbal skin care formulations from the hydro-alcoholic extract of *Leucas zeylanica* (L.) W.T.Aiton

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Abstract

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Introduction: *Leucas zeylanica* (L.) W.T.Aiton is a plant used in traditional medicine as a remedy against several dermatological conditions. The high UV-filtering potential observed for the aqueous-methanolic extract of this plant suggests its suitability to develop herbal skin care agents. Therefore, this study was undertaken to develop herbal skin care formulations from the aqueous methanolic (hydro-alcoholic) extract of the whole plants of *L. zeylanica* and evaluate the photoprotective efficacy.

Methodology: Three formulations were prepared by incorporating different concentrations (25%, 50%, and 75%) of the extract into an aqueous cream base. Thereafter, the UV filtering potential and sun protection factor (SPF) were determined.

Results: The formulation comprised of 75% of the extract displayed the highest UV absorbance as well as the highest SPF value (26.76±3.82). All formulations in general exhibited good photostability profiles. The anti-tyrosinase assay revealed very mild tyrosinase inhibitory potential of the aqueous methanolic extract of *L. zeylanica*. Therefore our formulations do not interfere with the biosynthesis of melanin, the natural photoprotectant molecule in the skin, unlike most commercial sunscreens.

Conclusion: The strong and broad-range UV-filtering potential, high SPF and photostability profiles observed for the sunscreen formulation comprised of 75% of the extract suggest the potential utility of *L. zeylanica* extract for the development of herbal skin care formulations in a commercial scale.

Keywords: Herbal, *Leucas zeylanica*, Photoprotective, Skin care, Sunscreens

Introduction

Leucas zeylanica (L.) W.T.Aiton (Figure 1), locally called “gata-thumbba” is a popular, multi-purpose medicinal plant in Sri Lanka that belongs to the family Lamiaceae. Different parts of this plant have been extensively employed in traditional medicine as a remedy for various inflammatory conditions, gout, headaches, vertigo, and also as an anthelmintic medication [1]. Besides, the leaves of the plant are consumed as a vegetable [2]. The extracts prepared from *L. zeylanica* exhibited hepatoprotective effects [3] and were found to be highly effective against *Enterobius vermicularis* infections in adults [4]. Furthermore, the lipophilic extracts have displayed potent anti-inflammatory activities by inhibiting the two enzymes; 5-lipoxygenase and microsomal prostaglandin E₂ synthase-1 involved in the synthesis of pro-inflammatory eicosanoids. These lipophilic extracts have also inhibited the activity of the xanthine oxidase enzyme and displayed moderate antimicrobial activities [1]. Moreover, *in vitro* and *in vivo* studies revealed that the extracts of *L. zeylanica* were safe and non-toxic in terms of skin irritation, cytotoxicity, and genotoxicity, thus potential utility as a pharmaceutical and cosmetics agent [5].



Fig.1: Leucas zeylanica (L.) W.T.Aiton

Although *L. zeylanica* is widely used in the treatment of skin diseases, wounds, sores, itches, etc. in traditional medicine, these claims are hardly explored and validated by scientific methods. In an early attempt, Napagoda et al. reported a strong, broad-range photoprotective activity in the aqueous methanolic extract of this plant [6]. As an extension of the above study, the current research aimed at developing skin

care formulations from the aqueous methanolic extract and evaluating the photoprotective and skin whitening potential of the prepared formulations.

Method

Plant material

The whole plants of *L. zeylanica* were collected from local cultivations in Western and Sabaragamuwa provinces of Sri Lanka in 2018. The plant was authenticated by comparison with the herbarium specimens at the National Herbarium, Royal Botanical Garden, Peradeniya, Sri Lanka. A voucher specimen (Leu-2018-4) is deposited at the Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka.

Preparation of crude extract

The whole plants of *L. zeylanica* were washed and dried in the shade (30 °C) for five days. Thereafter, dried plants were powdered and the powdered materials (11 g) were extracted in 180 mL of 70% methanol-water mixture. The extracts were evaporated to dryness with a rotary evaporator (HS-2005V-N, South Korea).

Determination of the total phenolic content of the crude extract

The total phenolic content in the plant material was estimated by the method adopted from Gangwar et al [7] with some alterations. The analysis was done using Folin-Ciocalteu method, where the ultimate response is the formation of a blue complex by the phenolic compounds present in the extract. A volume of 500 µL of extract solution (1 mg/mL) in methanol was mixed with Folin-Ciocalteu reagent (2500 µL). The resulting solution was mixed and incubated for 5 minutes. Thereafter, Na₂CO₃ (2500 µL) was added and the reaction mixture was diluted to 10 mL by adding distilled water, followed by incubation at room temperature in the dark for 2 hours. The absorbance was measured at 765 nm using a UV-visible spectrophotometer (Shimadzu, UV_1800). The gallic acid was used to prepare the standard curve. The results were expressed as mg of gallic acid equivalent (GAE)

per gram of dry plant material.

Determination of tyrosinase inhibition

The skin whitening potential of the extract was determined by following the method described by Napagoda et al [8]. This assay is based on measuring the inhibition of tyrosinase, a key enzyme in melanin biosynthesis. In brief, the plant extract was dissolved in 50 mM potassium phosphate buffer (pH 6.5) and tested for tyrosinase inhibition at a concentration of 333.3 µg/mL at the 96-microwell plate. A volume of 70 µL of the extract was mixed with tyrosinase (333 units/mL in phosphate buffer, 30 µL) and the mixture was incubated at 37 °C for 10 minutes. Thereafter L-tyrosine (110 µL) was added to each well. The reaction mixture was incubated again at 37 °C for 30 minutes. The absorbance was measured at 492 nm (Thermo Scientific-Multiskan Go Microplate spectrometer). The percentage inhibition of tyrosinase activity was calculated using the following equation.

$$\% \text{ Inhibition} = [(A - B) / A] \times 100$$

where, A = absorbance without the test sample (control), B = absorbance with the test sample. Ascorbic acid was used as a positive control. The experiments were carried out in triplicate.

Evaluation of UV-filtering potential of the crude extract

The UV-filtering potential of the extract was evaluated following the method described by Napagoda et al. [6] and the sun protection factor (SPF) was calculated according to the Mansur equation [9]. In brief, the UV absorption of the extract (at a concentration of 1 mg/mL) was measured between 260–400 nm at 5 nm intervals using a UV-visible spectrophotometer (Shimadzu, UV_1800). The UV absorbance values between 290–320 were substituted in the Mansur equation to calculate the SPF.

$$SPF_{\text{spectrophotometric}} = CF \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda)$$

where: EE(λ) – erythemal effect spectrum; I(λ) – solar intensity spectrum;

Abs(λ) – absorbance of sunscreen product; CF – correction factor (=10)

Development of herbal sunscreen formulations

Sunscreen formulations were prepared by incorporating the plant extract at different concentrations (i.e., 25%, 50%, 75%) into an aqueous cream base that comprised cetostearyl alcohol, white soft paraffin wax, and sodium lauryl sulphate.

The UV filtering capability of each formulation was determined as mentioned above. All the formulations were exposed to direct sunlight for 21 days and UV absorption was measured on 7th, 14th, and 21st day and subsequently, the SPF values were calculated. The aqueous cream base was employed as the negative control, while a commercially available sunscreen product containing benzophenone-4 and TiO₂ as active ingredients was used as the positive control.

Determination of the photostability of the formulations

The photostability of the formulations was determined following the method described by Gonzalez et al. [10] with several modifications. Each formulation (50 mg) was applied evenly on a 25 cm² area of a stainless-steel plate, corresponding to an area density of 2.0 mg/cm² [10,11]. The plates were dried for 15 min under dark conditions and thereafter exposed to natural sunlight for the same length of time from 10.00 a.m. to 3.00 p.m. Control plates that have not been exposed to sunlight were also prepared for UV absorption measurements.

The exposed and non-exposed formulations were dissolved in distilled water to reach a final concentration of 0.2 mg/mL and thereafter the UV absorbance of each sample was measured from 290 to 400 nm. A commercial sunscreen product was used as the positive control while the aqueous cream base that has been used to prepare sunscreen formulations was tested as the negative control. The experiment was performed in duplicate. The average absorbance values were used to draw a curve of absorbance versus wavelength. The area under the curve (AUC) from 290 to 400 nm as well as UV-A₁ (340–400 nm), UV-A₂ (320–340 nm), and UV-B (290–320 nm) regions were calculated for each of the exposed and non-exposed samples. The AUC

index was determined from the equation;

$$\text{AUC Index} = \frac{(\text{AUC exposed})}{(\text{AUC Non-exposed})}$$

According to the calculation, if the AUC Index \geq 0.8, the sunscreen formulation was considered to be photostable [10].

Statistical analysis

All the above experiments were performed in triplicate and the values were given as mean \pm S.D

Results

Determination of the total phenolic content of the crude extract

The Folin-Ciocalteu reagent was used to estimate the total phenolic content of crude aqueous methanolic extract of *L. zeylanica* and expressed as gallic acid equivalents (GAE). The amount was calculated from the linear regression equation of the standard curve of gallic acid ($Y=0.0041x + 0.0197$, $R = 0.985$). The results showed that the aqueous methanolic extract of *L. zeylanica* contained a high amount of phenols (50.63 ± 18.18 mg GAE/g) suggesting that the extract is capable of absorbing UV radiation more effectively.

Determination of tyrosinase inhibition

The aqueous methanolic extract of *L. zeylanica* displayed a very mild anti-tyrosinase activity with a percentage inhibition of 25.12 ± 4.77 at a concentration of $333.3 \mu\text{g/mL}$. On the other hand, ascorbic acid (positive control) displayed a percentage inhibition of 100 ± 0.58 at the same concentration.

Evaluation of UV-filtering potential of the crude extract

In agreement with the findings of Napagoda et al. [6], a broad spectrum of UV absorbance was observed for the aqueous methanolic extract. This was conspicuous within the 280–340 nm range that covers both UV-B and UV-A regions of the electromagnetic spectrum (Figure 2). The subsequent calculation revealed a SPF value of 39.8 ± 0.12 for this extract.

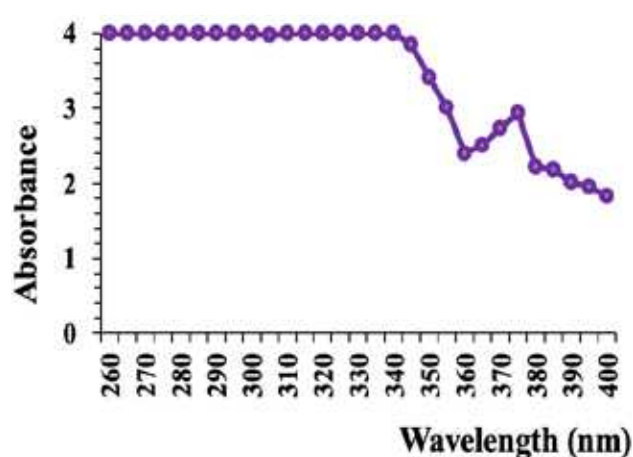


Fig.2: Absorption of UV radiation between 260–400 nm by the aqueous methanolic extract

The average absorbance values ($n=3$) observed for the plant extract are plotted against the wavelength.

Development of herbal sunscreens and evaluation of UV-filtering potential

An ideal sunscreen should possess high SPF value, a broad spectrum of UV-protection, and photostability [12]. Therefore, the sunscreen formulations prepared in this study were evaluated using the above parameters.

As indicated in Figure 3, a broad spectrum of UV absorbance was observed for all the formulations prepared from *L. zeylanica* extract. In comparison to the two counterparts, more noticeable UV absorbance was detected in the formulation comprised of 75% of the extract (Figure 3). This formulation (Figure 4) displayed its maximum absorbance at 290 nm while retaining high absorbance values in the range of 280–350 nm covering both UV-B and UV-A regions. The UV absorption potency of the commercial sunscreen product (positive control) was lower than that of the herbal formulations. The UV absorbance was insignificant in the negative control (not shown in Figure 3) which was used as the cream base to prepare the sunscreen formulations. This indicates a negligible contribution of the cream base to the observed high UV absorbance in the formulations prepared using it.

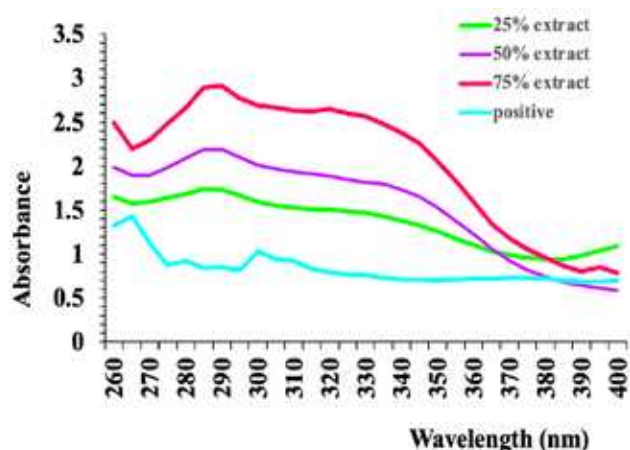


Fig.3: Absorption of UV radiation by different formulations

The average absorbance values (n=3) observed for the three sunscreen formulations and the positive control (commercial sunscreen) are plotted against the wavelength.



Fig 4: Formulation comprised of 75% of the aqueous-methanolic extract of *L. zeylanica*

Figure 5 illustrates the variation of SPF values with time upon exposure to direct sunlight. The initial SPF values of the formulations consisting of 25%, 50%, and 75% of *L. zeylanica* were observed as 15.67 ± 0.39 , 19.83 ± 2.49 , and 26.76 ± 3.82 respectively. Interestingly the SPF values of all three formulations hardly changed by storing in direct sunlight. The SPF value of the commercial sunscreen was found as 5.03 ± 0.32 .

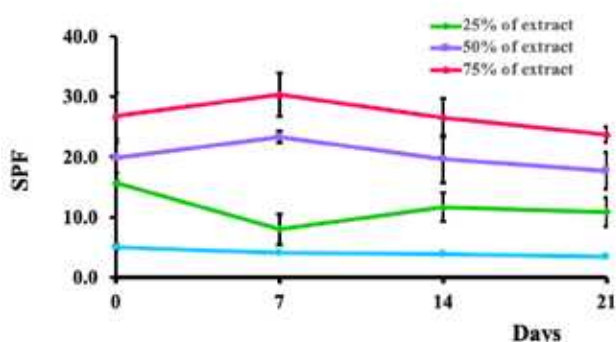


Fig.5: Variation of SPF in different formulations after exposure to direct sunlight

The sunscreen formulations and the positive control were stored under direct sunlight for 21 days. The SPF values were calculated on 7th, 14th and 21st day using the UV-absorbance data. The variation of SPF value at different time intervals is shown in this figure (n=3).

Determination of the photostability of the formulations

Table 1 shows the AUC index values of the prepared sunscreen formulations along with positive control and negative control. According to this, all the formulations displayed photostability by giving AUC index values higher than 0.80 within the total spectrum as well as UV-B, UV-A₁, and UV-A₂ regions. Moreover, the positive control was also photostable but its photostability was lower than the photostability of the sunscreen formulations which were under investigation. The negative control lacked photostability due to the AUC index values far below 0.80. This suggested the unavailability of any UV-protective molecule within the cream base. The 50% extract incorporated formulation displayed the highest photostability among all the formulations by giving high AUC index values. Furthermore, all the formulations displayed promising photostability in UV-A than in UV-B, as these formulations have high AUC index values in UV-A region. Therefore, improvement of the prepared sunscreens in commercial scale would give higher protection to consumers as commercially available sunscreens are highly susceptible to UV-A mediated photodegradation.

Table 1: AUC index values for the investigated sunscreen formulations

Sample	AUC Index			
	Total spectrum	UV-B	UV-A ₁	UV-A ₂
25% of extract	1.20	1.12	1.34	1.21
50% of extract	1.27	1.23	1.36	1.29

Discussion

Skin is the outermost barrier of the body that is constantly being challenged by various factors such as solar ultraviolet radiation, humidity, allergens, microbes, pollutants, etc. Therefore, a diverse range of skin care products including

sunscreens, moisturizers, anti-aging, anti-acne as well as skin whitening formulations have been introduced and become highly popular [13]. The topical application of sunscreens enriched with UV absorbing, reflecting, or scattering molecules reduces the penetration of harmful UV radiation whereas the skin whiteners usually interfere with the synthesis of melanin, a photoprotective molecule responsible for the pigmentation of human skin [6, 8]. The UV-A and UV-B components of solar ultraviolet radiation are responsible for immediate and delayed tanning [14] while Asian skin in particular is highly vulnerable to solar radiation-induced irregular and hyperpigmentation [15]. Thus, many sunscreen products contain UV-absorbing aromatic compounds like salicylic acid, para-aminobenzoic acid, and benzoic acid, which have been identified as tyrosinase inhibitors interfering with the production of melanin, hence preventing the sun tanning of the skin. However, it is speculated that despite the effective filtering of UV radiation, the inhibition of melanin biosynthesis by such UV-filters might influence the malignant melanoma incidence upon solar exposure [16]. In this respect, the very mild anti-tyrosinase activity of the aqueous methanolic extract of *L. zeylanica* extract would make our sunscreen formulations distinctive from most of commercial sunscreens.

Since many commercial sunscreens are capable of providing protection against UV-B only, the development of broad spectrum sunscreens with both UV-B and UV-A radiation barring potential is a timely need. The sunscreen formulations developed from the aqueous methanolic extract of *L. zeylanica* could be considered as a solution to this issue. Herbal formulations prepared in this work were found to be superior to the commercial sunscreen that was used as the positive control with respect to the SPF value and photostability. The protection offered by the sunscreen formulation from UV radiation increases with the extract concentration, thus the highest absorbance and the highest SPF were observed with the formulation consisting of 75% of the extract. This sunscreen formulation

is of great significance not only due to its high SPF value but also due to its photostability and broad spectrum sunscreen activity. Normally, sunscreen products are categorized according to their SPF values as “minimal” (SPF < 12), “moderate” (SPF 12-30), and “high” (SPF ≥ 30) sun protection products [17].

Our observations demonstrated that the formulation comprised of 75% extract has the potency of a “moderate” sun protection product due to its SPF value of 26.76 ± 3.82 . This formulation displayed a broad spectrum of sun protection by efficiently absorbing the UV radiation between 280–350 nm which covers UV-B and UV-A regions of the solar electromagneticspectrum. Based on these findings, experiments are underway to enhance the UV filtering capacity of these formulations using a nanotechnological approach to develop herbal skin care agents in a commercial scale.

Conclusion

The findings of this study revealed that the aqueous methanolic extract of the whole plant of *L. zeylanica* was a promising candidate for the development of herbal sunscreen formulations. The presence of a high amount of phenols in this extract might be responsible for the effective absorption of UV radiation. In general, all formulations prepared from this extract exhibited good SPF values and photostability, yet, the formulation containing 75% of the extract was found to be superior with respect to the broad spectrum UV-filtering ability, high SPF, and photostability. These results offer great promise for the development of herbal skin care products of high commercial value from the aqueousmethanolic extract of *L. zeylanica*.

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Conflicts of interest

The authors declare that they have no competing conflict of interest.

Ethical Approval

Not applicable

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Original Article

Knowledge on street food safety among a selected group of Sri Lankan students; A cross-sectional study

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Introduction: Street food has been frequently reported to contribute to foodborne illnesses. As a result, the safety of street food has been given major attention. Numerous studies have shown that a lack of knowledge among university students regarding street food safety results in a risk of contracting food-borne illnesses.

Objective: Determine the knowledge of street food safety among undergraduate students.

Methodology: A pre-tested, self-administered questionnaire was used to collect data related to students' socio-demographic details and food safety knowledge. In this study, 332 street food consumers (220 females and 112 males) voluntarily participated. The data were analyzed with SPSS version 26 using p value < 0.05 as statistical significance. Descriptive and inferential statistics were used for analysis.

Results: The study showed that street food consumers' knowledge on food safety was average. The knowledge regarding food safety was not significantly associated with socio-demographic factors assessed (gender, age, ethnicity, marital status, study program, academic year, and accommodation method) ($p > 0.05$). The majority of consumers were aware of the possibility of food contamination, the value of washing hands, and the need for adequate hygiene in order to prevent foodborne illnesses. However, some aspects related to knowledge of food safety caused concerns. The majority of customers found it difficult to understand that food does not transmit AIDS.

Conclusion: Young adults should be educated about food hygiene and safety. However, further studies are necessary to confirm these findings.

Keywords: Street foods, Food safety, Knowledge, Hygiene, Gender, University students

Introduction

“Street food” refers to all consumables that are prepared, cooked, and served in public, such as on the streets, sidewalks, or in busy markets from mobile stalls, carts, food trucks, etc. (Choudhury et al., 2011). It is convenient because it is easily available, cheap, and easy to afford as well as tasty, authentic, and culturally enriching. Thus, it plays a prominent role in eating habits, particularly in middle and lower income groups. Further, it provides the local community with economic support and employment by increasing local food processing systems and agricultural producers (Khairuzzaman et al., 2014).

Customers, especially young students, like street food due to its taste, accessibility, variety, and affordability (Sanlier et al., 2018). The young generation does not have the time to cook and prepare their own food due to their hectic schedules, higher education commitments, and personal culinary demands. As a result, they are tempted to purchase street food more frequently (Wilcock et al., 2004).

Foodborne illnesses are growing in importance as a public health issue in both developed and developing nations (AL-Mohaithef et al., 2020). In developing countries, consumption of street food has been linked to the spread of foodborne illnesses (Ma et al., 2019) and is recognized as a frequent means of transmitting drug-resistant bacteria (Guyen et al., 2010). Elevated levels of coliform bacteria have been detected in street foods in several countries (Ma et al., 2019). In addition, epidemiological studies suggest that a sizable fraction of food poisonings are caused by street foods. Nevertheless, there have been a number of reported instances of food poisoning outbreaks attributed to street food. Foodborne bacterial pathogens commonly found in street food include *Bacillus cereus*, *Clostridium perfringens*, *Staphylococcus aureus*, and *Salmonella* spp. In addition, people who eat street food are said to contract food-borne illnesses such as cholera and typhoid fever (Rane, 2011).

Food safety has long been the subject of scholarly research, and street food shows a weak link in food safety supervision (Ma et al., 2019). The safety of street food remains a public health concern, especially in developing countries like Sri Lanka where foodborne illnesses are associated with food practices. In 2012, Gunasekera et al. (2017) in Sri Lanka reported that the prevalence of *Bacillus cereus* was 56% in Chinese-style fried rice available in Colombo (Gunasekera et al., 2017). Efforts to prevent foodborne illnesses require sufficient knowledge of hygiene and safety standards from both food processors and consumers.

The lack of awareness of street food safety is a significant issue among undergraduates. Numerous research has indicated that university scholars possess insufficient awareness about street food safety, which endangers their health from food-related illnesses (Luo et al., 2019). Enhancing public awareness and education regarding food safety can facilitate prompt corrective measures and precautionary steps by the authorities.

Literature on customer’s knowledge of food hygiene and the safety of street food in Sri Lanka is limited. Therefore, there is a need for studies in this avenue as Sri Lanka has been experiencing a significant increase in the street food vendor population in recent years, synchronous to the population growth in urban areas. Compared to the other countries in the region, the status of the street vendors in Sri Lanka is in a better position, and business activities are operated in places like pavements of major roads, sides of streets, and some assigned places allocated by authorities such as municipal councils (Karunaratna & Tjandra, 2021).

Methods

A descriptive cross-sectional study was conducted at Kaatsu International University (KIU), Sri Lanka. A total of 332 undergraduates (220 females and 112 males) were randomly selected. Data was collected using a pre-tested,

self-administered questionnaire containing four sections and a total of 43 items. The questionnaire was created based on previously published studies (Luo et al., 2019; Ali et al., 2018) and the WHO Five Keys to Safer Food (Mwamakamba et al., 2012). The questions/statements were modified to suit the objectives of the study. To determine different areas of the self-administered questionnaire, the participant had to select the direct answers/ multiple choices in each section. To ensure the quality and reliability of the questionnaire, the pre-test was conducted twice. The first pre-test was conducted among 20 students and the second pre-test was conducted among 10 university students who were not included in the formal investigation.

The first section consisted of socio-demographic details. The second section assessed the knowledge of participants related to street food safety. Each correct knowledge item reported was awarded a score of 1 point. Incorrect knowledge was awarded a 0 score (including “do not know” and “No idea”). For the Likert scale, if “agree” was the correct answer, then “agree” was scored as 4 points while “Neutral”, “disagree” and “No idea” were scored 3, 2 and 1 points respectively or if “disagree” was the correct answer, then “disagree” was scored as 4 points while “Neutral”, “agree” and “No idea” were scored 3, 2 and 1 points respectively. For total knowledge score calculation, a score of less than 22 was considered to indicate a poor level of food safety knowledge, 22-35 denoted an average level, and more than 35 was considered good.

IBM SPSS version 26 was used to examine the data, and a p value < 0.05 was used to determine statistical significance. Descriptive and inferential statistics were used for data analysis. The Chi square test was used to assess the association between demographic characteristics and knowledge score of street food safety.

Ethical approval was obtained from the Ethical Review Committee of KIU (KIU_ERC_21_57).

Results

Among the total undergraduates (n=332), 220 (66.3%) were female and 112 (33.7%) were male consumers. Consumers' age ranged from 18 to 45 years, with a majority of 79.8% (n=265) participants between 18-25 years of age. Socio-demographic factors (age, gender, ethnicity, marital status, study program, academic year, and accommodation method) did not have a significant effect on the level of food safety knowledge of the consumers ($p > 0.05$).

The mean knowledge scores among male and female students were 28.59 ± 4.61 and 29.02 ± 4.19 , respectively. No statistically significant difference was observed between the knowledge levels and gender ($p=0.267$).

The results reflect that most respondents (89.5%) had an average knowledge regarding food safety. 8.7% of respondents had poor knowledge while the least number of respondents (1.8%) had good knowledge. The mean consumer food safety knowledge score was 28.876 ± 4.33 (Figure 1).

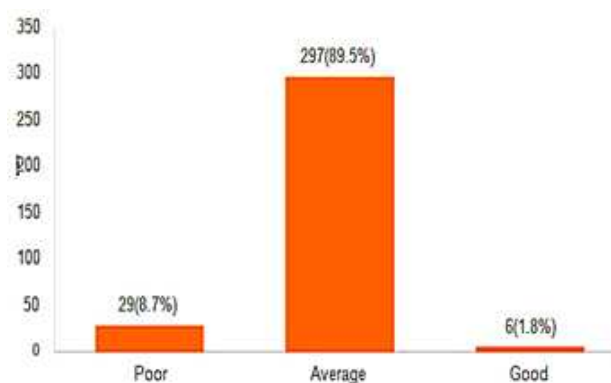


Figure 1: Distribution of total knowledge level among participants

According to the responses of the consumers on food safety knowledge statements mentioned below, more than half of consumers (53.6%, n=178) were aware that eating and drinking at work raises the risk of food contamination. Some consumers (7.8%, n=26) disbelieved that AIDS can be transmitted by food while 81.9% (n=272) of respondents had no idea about transmission of

AIDS. More than half of the consumers (69.3%, n=230) knew that using gloves lowered the risk of food contamination. Most of the consumers (53.6%, n=178) were aware that partially cooked food increases food contamination. Less than half of consumers (44.9%, n=149) believed that reheating cooked foods contributed to food contamination. Of the respondents, 16.3% (n=54) wrongly believed that street food can be kept in the refrigerator for a long time. Most of the participants had no idea about food safety. Almost half of consumers (50.6%, n=168) knew that proper cleaning and disinfection of food utensils reduced the risk of contamination.

Majority of the females (68.6%, n=151) and males (66.1%, n=74) knew the definition of non-communicable diseases (NCDs) while only 8.6% (n=19) females and 5.4% (n=6) males knew that excessive intake of salt, sugar, and oil is the major cause for these types of diseases. Most of the participants could correctly select diabetes, cancer, and cardiovascular diseases as NCDs from the given list. Some participants wrongly believed that HIV and COVID-19 are also considered as NCDs. Almost all the respondents, 91.1% (n=102) males and 90% (n=198) females had an idea about the symptoms of foodborne illnesses. More than half of the males (59.8%, n=67) and females (61.4%, n=135) knew that foodborne diseases can be transmitted by consuming street food.

More than three-quarters of the participants, 75.9% (n=85) males and 78.2% (n=172) females knew that feco-oral route is the main transmission mode of foodborne diseases, but only 30.4% (n=34) males and 28.2% (n=62) females could identify that foodborne diseases can be transmitted by infected animals. The majority of participants, 67.0% (n=75) males and 80.5% (n=177) females knew that bacteria is the most common type of foodborne pathogens. A lower number (25.9%, n=86) of students wrongly stated blood transfusion, unprotected sexual intercourse, and mother-to-baby via birth canal as the transmission methods of food-borne diseases.

Discussion

According to the findings of this study, the majority of university students had average knowledge regarding street food safety, despite the fact that a greater number of university students pursued science-related degrees. In a similar study in Haiti, it was seen that consumers of street food had an average level of knowledge (Samapundo et al., 2015). However, these results contradict the previous findings of Mamun et al. (2020), which concluded that street food consumers had poor knowledge regarding food safety (Mamun et al., 2020). In contrast, a high level of food safety knowledge was observed among the veterinary medicine students at Trakia University, Bulgaria (Stratev et al., 2017). It is evident that health education on food handling is necessary to minimize street foodborne infections. However, little attention is currently focused on educating the Sri Lankan population in this regard and has to be addressed immediately with a view to change the behavior of consuming street food.

Further, there is insufficient understanding of food safety in Sri Lanka amongst young adults, due to a lack of educatory programs during primary and secondary school education on food safety. Further, public awareness through social media and televisions, newspapers is not given prominence in Sri Lanka. Previous reports have highlighted the need to enhance consumers' level of food safety knowledge which will greatly contribute to the prevention of foodborne illness outbreaks (Ali et al., 2018). The study shows the importance of health education of the consumers by public health institutions using the mainstream media (radio, television, print, online, and social media) to develop knowledge related to food safety, that will benefit public in everyday lives.

The purchasing power by consumers for street food provides perhaps the strongest motivating force for vendors to alter their food-handling practices. Ultimately, it is the consumer who makes the choice of what to consume and from

whom to purchase it. Street food consumers also will bear the consequences if that food is unsafe. Unfortunately, consumers are often unaware of the relationship between contaminated food and foodborne diseases. Therefore, consumers must be involved in efforts to improve the safety of street-vended food. To achieve this, relevant health authorities should make it a priority to increase the safety of street food and start suitable training programs, national seminars, social media campaigns and workshops on foodborne illnesses, food safety, and food security for both school and university students. The inclusion of food safety and security themes in textbooks of school and university curricula would also present chances for raising public understanding of nutrition and food security. To raise consumer awareness, attitudes, and behavior in Sri Lanka about food safety, further legislation and initiatives should be promoted.

Although this study did not reveal a statistically significant difference among gender, age, civil status, ethnicity, accommodation, employment, other studies globally have shown contradictory and similar results. A study conducted in Canada reflected that males in the Faculty of Science had relatively higher knowledge than females in the Faculty of Science, both of whom had relatively higher knowledge than all students in other Faculties (Courtney et al., 2016). In addition, the results of a study conducted in Vietnam revealed that no significant difference occurred between the food safety knowledge levels of

the consumers on the basis of gender. However, significant differences occurred based on age, education level, food safety training status and location (Samapundo et al., 2015). Socio-cultural differences in these populations could be the reason for the difference in results seen. The results of the study strongly emphasize that properly designed, continuous seminars, workshops, and training programs and strengthening health education about food safety are major strategies to enhance food safety awareness among university students and thus prevent foodborne illnesses.

Conclusion

In conclusion, the majority of participants had an average knowledge regarding street food safety, reasons for food contamination and food borne diseases. Further studies are required to confirm these findings.

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Conflicts of Interests

There are no conflicts of interest.

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Original Article

Assessment of Antibiotics Prescribing Patterns at the Outpatient Department of a Specialized Children Hospital in Sri Lanka: Using WHO Recommended Prescribing Indicators

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Abstract

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Introduction: "Essential Medicines List," was released by the World Health Organization (WHO) and contains medications including some antibiotics that are considered the most effective and secure ways to fulfil the best patient management. Despite the establishment of standard metrics by the WHO to govern pharmaceutical utilization, irrational prescription is common, particularly in developing countries.

Objective: To assess the antibiotics prescribing patterns at the Outpatient Department of Sirimawo Bandaranayake Specialized Children Hospital in Sri Lanka using WHO prescribing indicators.

Methodology: A descriptive cross-sectional study was conducted among 375 pediatric patients' prescription notes aged 1 to 14 years using a data extraction sheet from prescription notes and prescription registration books. The extraction details included the generic name of the drug, number of drugs recommended, presence of antibiotics and mode of administration.

Results: The majority of the encounters (52.8%, n=198) included male pediatric patients. The average number of medications administered per encounter was 3, with 6 medications being the highest. In the outpatient department, 46.9% (n=176) of the encounters contained antibiotics while none of the prescriptions contained injectable medications. The majority of the prescriptions (53.6%, n=201) contained drugs that were not from the essential medicines list while 50.1% (n=188) contained medications prescribed using the trade name.

Conclusion: In conclusion, polypharmacy, and antibiotics which were not from the essential medicines list were prominent among the prescription sheets issued to pediatric patients.

Keywords: Antibiotics, Pediatrics, WHO prescribing indicators-group 1

Introduction

Antibiotics are recommended medications used to treat, and in certain instances, to prevent bacterial infections (Angulo et al., 2009). Antibiotics are among the most frequently prescribed medications in modern medicine. However, antibiotics should not be issued without a medical prescription since antibiotic abuse can result in the emergence of resistant strains of bacteria contributing to a global crisis. Further, antibiotic utilization has risen globally, with most of the increase occurring in low and middle-income countries (Fink et al., 2020; Iskandar et al., 2021).

Children and infants are among the most vulnerable populations when it comes to bacterial infections. Consequently, the use of antibiotics in the treatment of bacterial infections among children has become frequent. Also, pediatricians and other health workers who provide health care for infants and children in developing nations face significant challenges, including a lack of adequate drugs, rising costs, and insufficient infrastructure, followed by antibiotic resistance, which is primarily caused by antibiotics being prescribed for viral infections where antibiotics are contraindicated (Arulmoli et al., 2009). In this manner, several studies have shown that nearly 37% of the prescriptions contain antibiotics (Anong & Akoachere, 2018; Ntšekhe et al., 2011).

Conversely, antibiotic prescription varies between countries, as evidenced by the fact that in Africa and Asia, one out of every two hospitalized patients receive antibiotics, but in Europe, one out of every three patients receive antibiotics (Yimenu et al., 2019). Meanwhile, infectious diseases are on the rise in low-income countries (LICs), due to drug shortages and lack of qualified healthcare providers. Further, when there is a shortage of drugs, healthcare practitioners are more vulnerable to prescribing arbitrarily. Therefore, WHO in partnership with the International Network of Rational Medicine Use (INRDU) has established a set

of indicators to measure the use of antibiotics in healthcare facilities that include prescribing indicators, facility indicators, and patient care indicators (WHO, 2018). These indicators could be utilized as a benchmark for implementing antibiotic stewardship programs (ASPs) in various healthcare settings. The WHO has issued the “WHO Model List of Essential Medicines”, known as the Essential Medicines List, which includes the drugs together with some antibiotics that are considered the most efficient and secure means for meeting the crucial requirements in a health system (WHO, 2019).

Currently, antibiotic resistance is accelerated due to the misuse and overuse of antibiotics. Previous reports suggest that antibiotics are often provided erroneously or improperly for 44% to 97% of hospitalized patients in underdeveloped nations (Otim et al., 2021; Zellweger et al., 2017). In Sri Lanka, the rate of antibiotic prescriptions was 69.9%, which is three times higher than the WHO recommended figures, according to a study by Thiyahiny et al. (2019). Additionally, it stated that the antibiotic prescribing patterns were poor due to its incompleteness, and improvements needed to be made (Thiyahiny et al., 2019). Therefore, to prevent and control the spread of antibiotic resistance, health professionals must adhere to guidelines when prescribing and dispensing antibiotics. Yet, there is a scarcity of published reports on prescribing patterns in Sri Lanka, especially in the pediatric population. Therefore, the current study aimed at assessing antibiotics prescribing patterns at the outpatient department of Sirimawo Bandaranayake Specialized Children Hospital, Peradeniya using WHO prescribing indicators-group 1.

Methodology

The study was conducted at the outpatient department of Sirimawo Bandaranayake Specialized Children Hospital (SBSCH) in Peradeniya, Sri Lanka. A descriptive cross-sectional study was conducted, and the sample consisted of 375 prescription notes issued from March 2020 to May 2020. The sample size was

calculated using the Danial formula (p=58.5%-percentage of encounters contained antibiotics) (Dawit, 2019). The prescribing notes of children between 1 to 14 years who had been treated at the outpatient department were included in this study. The sample selection was based on a raffle technique where the first 10 prescription sheets were selected followed by every fourth sheet using the serial number of the prescription sheets as a reference until the sample size was achieved. The data were extracted (the generic name of the drug, number of drugs recommended, presence of antibiotics, and mode of administration) from prescription notes and prescription registration books. A pre-designed checklist was used to collect data. Prescription indicators from the World Health Organization/International Network of Rational Use of Drugs (WHO/INRUD) were used to assess rational drug use, with an emphasis on antibiotic prescribing trends (Shankar, 2014; WHO, 2018). Data were analyzed in SPSS version 24 using descriptive statistics including frequency, average, and percentage. To determine the validity and reliability of the parameters of concern, a pretest of the data extraction sheet was performed using 10 prescription sheets.

The ethical approval was obtained from the Ethics Review Committee of the KIU Campus (KIU/ERC/20/03).

Results

Of the 375 pediatric prescription notes, 52.8% (n=198) were issued for male children. The majority (42.7%, n=177) of the prescription notes contained patients in the age group of 1 to 5 years followed by 40% (n=150) in 5 to 12 years.

The analysis of the prescription showed that the majority (40.5%, n=152) of the patients had been prescribed three medications, 46.9% (n=176) were prescribed antibiotics, while 50.1% (n=188) of the prescription notes did not have the generic name and 53.6% (n=201) of the prescribed medications included drugs that are not in the

essential medicines list (Table 1). However, no injectable medication was given in the outpatient department. A total of 1112 medicines among the 375 pediatric prescription notes were prescribed with an average number of drugs per encounter found to be 3 (Table 2).

Table 1: Prescription Pattern

Prescription	Frequency	Percentage (%)
Number of medications prescribed		
1 drug	13	3.5
2 drugs	110	29.3
3 drugs	152	40.5
4 drugs	78	20.8
5 drugs	21	5.6
6 drugs	01	0.3
Presence of antibiotics		
Yes	176	46.9
No	199	53.1
Drugs prescribed by generic name		
Yes	187	49.9
No	188	50.1
Drugs from essential medicines list		
Yes	174	46.4
No	201	53.6
Prescription with injectable medication		
Yes	0	0
No	375	100

Table 2: Summary of Prescribing Indicators

Prescribing Indicators	Total Number of Drugs	Percentage	WHO Standard Value (%)
Average number of drugs per encounter	1112	2.96	1.6-1.8
Percentage of encounters with antibiotics	176	46.9	20-26.8
Percentage of encounters with injectable medication	0	0	13.4-24.1
Percentage of drugs prescribed by generic name	187	49.9	100

All the 375 prescription notes included patients' information (age, name, gender) except their height and weight.

Discussion

In the current study, the average number of drugs per encounter was 3 which was above the recommended range (1.6-1.8) by the WHO. This finding was similar to the previous studies done by Galapaththy et al. (2021) and Rwan et al. (2009) in Sri Lanka which showed the average number of drugs per encounter as 3.0-3.1. However, in contrast, the average number of drugs per encounter was 4.8 in a study conducted in the Sri Lankan tertiary healthcare setting (Galapaththy et al., 2021; Worku & Tewahido, 2018). In this context, the average number of drugs per encounter is comparatively higher than the range of 1.6-2.0, which was found in the reports of Admassie et al. (2013) in Ethiopia; Desalegn (2013) in South Ethiopia and Yimenu et al. (2019) in North Ethiopia. The current study showed higher values in the average number of drugs prescribed per encounter resulting in an increase in the risk of polypharmacy. According to WHO, healthy prescribing practice is necessary to ensure that the number of drugs prescribed per contact is low as it is known to decrease polypharmacy, which reduces complications due to adverse medication reactions and inter-drug interactions (WHO, 2019).

In this study, 46.9% of encounters were with antibiotics which is a higher value than the prescribed WHO value (20-26.8%) for antibiotic prescription. However, this finding was in contrast with the study findings of Galapaththy et al. (2021) which reported that 23.8% of antibiotic prescriptions were from most of the districts in Sri Lanka. Interestingly, the current study findings on antibiotic prescribing were below the value of a study conducted in Northwest Ethiopia (69.6%) (Yimenu et al., 2019) and Southern Ethiopia (58.1%) (Summoro et al., 2015). However, the current finding was greater than the study conducted in Gondar City (29.3%), and Addis Ababa City in Ethiopia (38%) (Worku & Tewahido, 2018; Admassie et al., 2013). The higher rates of prescribing may be due to the clinician's uncertainty in deciding whether the illness is caused by bacteria or

viruses or awaiting investigations. Thus, this report highlights the urgent need for antibiotic stewardship.

The current report showed that all the studied prescriptions included patients' basic information such as age, name, and gender. Similarly, Yimenu in 2019 in Northwest Ethiopia reported that most of the prescriptions included age and gender (Yimenu et al., 2019). In contrast, a report by Worku and Tewahido (2018) from Ethiopia demonstrated that only 25% of the prescriptions included basic patient information such as age, name, and gender (Worku & Tewahido, 2018). It is noteworthy that many basic factors such as age and gender are important in the best medical care and in determining any errors that may have occurred during prescribing the medications. Thus, age and gender are necessary in determining the prescribing patterns, thus treatment outcomes (Li, Womer & Silber, 2004). Therefore, the current study reveals that basic information in the prescriptions is satisfactory of the population studied.

A previous study conducted in Sri Lanka found that 90.1% of drugs were prescribed by their generic name while in the current study percentage of medications prescribed by generic name was 49.9% (n=187) which is nearly half of the standard recommended value of 100% by WHO (2019). However, in India, prescribing drugs by the generic name was 73.4% (Awad et al., 2006) while in Nepal it was 19.2% (Lamichhane et al., 2006). The WHO recommends generic name prescribing since it improves communication and transparency among healthcare practitioners while minimizing drug treatment costs (Ofori-Asenso, 2016). Further, the National Medicines Regulatory Authority (NMRA) Act of Sri Lanka made it mandatory for medical professionals to write the generic name of a medication in a prescription in 2015 (NMRA, 2015). Despite the legislative change, the Sri Lankan prescriptions had an alarming lower level of generic name prescribing in the current study indicating the need for an awareness session to emphasize the usage of generic names in prescribing.

According to WHO, 100% of prescribed medications should be from the national essential medicines list. In the current study, drug prescription from the essential medicines list was 46.4% (n=174). Comparatively, reports of Iskandar et al. (2021) showed 91.1% of medicines prescribed from the essential medicines list in the National Hospital Sri Lanka (Iskandar et al., 2021). According to other studies, drugs in the essential medicines list were prescribed to 45.7% in India (Awad et al., 2006); 78.9% in Yemen (Hazra et al., 2000); 70% in Tanzania (Bashrahil, 2010) and 75-95% in Delhi in India (Biswas et al., 2000), respectively. Comparatively, the finding of the current study shows low usage of medications from the essential medicines list in Sri Lanka and an issue that needs the attention of relevant authorities.

The percentage of encounters in which injectable medication was prescribed at Sirimawo Bandaranayake Specialized Children Hospital was “0” which is below the values obtained from

several other studies globally including Ethiopia (38.1%), Uganda (48%), Indonesia (17%), and Mali (19%) (Awad et al., 2006; WHO, 2003).

Conclusion

In conclusion, the percentage of encounters with antibiotics was higher than the standard value of WHO also a degree of polypharmacy was identified as the antibiotic prescription pattern in this study setting.

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Conflicts of Interests

No conflicts of interest

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Original Article

The Impact of Facebook on Generation Z Consumer's Fast Food Purchase Intention; Reference to Colombo District, Sri Lanka

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Introduction: Due to the rising appeal of social media platforms among young individuals, fast-food advertisers see them as an efficient channel to promote businesses among youth. The fast-food industry has experienced a surge in popularity in Sri Lanka, particularly among the youth and individuals with hectic schedules. In comparison to other sectors, the franchise fast food industry in Sri Lanka extensively utilizes social media marketing for its promotional efforts.

Objectives: To evaluate the impact of Facebook on generation Z consumers' fast food purchase intention.

Methodology: A descriptive cross-sectional study was conducted among 242 generation Z consumers (people born between 1996 and 2010). Online questionnaire was used to gather details regarding consumers' preference for fast food purchases following advertisements on Facebook. Correlation and multiple linear regression analysis were employed to analyze the data using SPSS version 25.

Results: Most of the participants were males (62.5%, n=125), who belonged to the age category of 18-25 years. Findings revealed that activities such as Likes ($p < 0.05$), Friend's Likes ($p < 0.05$), Comment posting ($p < 0.05$), and Sharing ($p < 0.05$) on Facebook had a significant impact on the intention to purchase fast food. Additionally, the study indicated generation Z consumers are receptive to fast-food advertising on Facebook.

Conclusion: Generation Z consumers are receptive to fast food advertising on Facebook. Therefore, Facebook will be an effective method to promote fast food among generation Z consumers. Further, advertisements on Facebook would enhance the promotion of fast-food vendors.

Keywords: Comment posting and sharing, Fast-foods, Friends likes, Likes, Purchasing intention

Introduction

Social media refers to online platforms and technologies that enable users to create, share, and exchange information, ideas, and multimedia content in virtual communities and networks (Karaaslan et al., 2021). Scholars have followed the emergence of social media from the earliest electronic bulletin boards and online communities to current platforms such as Facebook, Twitter, and Instagram (Ansari & Khan, 2020). The increased use of social media platforms has been greatly aided by the widespread use of the Internet, the creation of user-friendly interfaces, and accessibility to low-cost personal computers and mobile devices (Ansari & Khan, 2020). The social effects of the emergence of social media have been researched by scholars. Past reports have investigated its effects on communication, identity development, political participation, activism, and information intake (Nadaraja & Yazdanifard, 2014).

Facebook boasts one of the largest user bases among social media platforms. Facebook now controls a significant portion of the social media market. In terms of user base, revenue, and overall market share, it has consistently ranked among the top social media platforms. Its dominance increases its appeal (Khan, 2018). Facebook's users are known to be highly engaged with the platform. Studies have shown that Facebook users spend a significant amount of time on the platform, interacting with content, sharing updates, and engaging with others. This high level of engagement is an indicator of its popularity (Nadaraja & Yazdanifard, 2014).

Social media platforms have emerged as powerful marketing and advertising tools in the digital age, with Facebook leading the way in terms of user engagement and reach. To capture the attention and loyalty of the younger generation, fast food companies have used Facebook's large user base targeting its capabilities to promote products (Ansari & Khan, 2020). Facebook has several distinguishing features that make it an appealing platform for fast food marketing. Fast food

brands can tailor their promotions to reach young consumers due to its ability to create targeted advertisements based on user demographics, interests, and behaviors. The interactive nature of the platform allows direct engagement with users via likes, comments, and shares, thereby fostering brand loyalty and raising brand awareness. Furthermore, Facebook's integration with other platforms, such as Instagram, broadens the marketing potential by bringing fast food promotions to a wider audience (Khan, 2018).

The exponential growth of Facebook advertising has had a significant impact on consumer purchasing habits, particularly in the fast food industry (Khan, 2018). Advertisements on Facebook use various persuasive techniques to influence consumer preferences and create a sense of urgency, such as appealing visuals, celebrity endorsements, limited-time offers, and targeted promotions (Yaman, 2016).

Furthermore, Facebook's interactive nature allows for user engagement, social sharing, and peer influence, which increases the effectiveness of fast food advertising on the platform (Yaman, 2016). As a result, there should be a proper mechanism in place to identify the factors that influence the fast-food consumption behavior among generation Z consumers. Because both advertisers and customers are still unaware of Facebook's influence on fast food purchasing behavior. There is limited existing research investigating the impact of Facebook on generation Z consumers' fast food purchasing intention. Therefore, the study aimed to evaluate the impact of Facebook orientation on generation Z consumers' fast food purchase intention.

Methodology

The study was based on the Theory of Acceptance and Use of Technology (UTAUT) model (Batucan et al., 2022). A descriptive cross-sectional study was conducted among 242 generation Z consumers (people born between 1996 and 2010) in Colombo district, Sri Lanka. The snowball sampling method was used to

enroll participants in the study. The data were collected by online questionnaires from 242 participants. The questionnaire was prepared on a 5-point Likert scale.

The results were analyzed using IBM SPSS version 25. The mean and the standard deviation were tested for the study to define the variables effectively. The correlation and regression analysis were performed to find the impact of independent variables such as Likes, Friend's Likes, Comments Posting and Sharing on Facebook over the dependent variable (Consumer Purchase Intention). A "p value" of 0.05 at 95% level of confidence was considered significant.

Results

In the process of data cleaning, 200 responses were accepted out of 242 for the analysis. The effective response rate was 82.6%. Cronbach's Alpha values of all items of the scales were above 0.7 (Sekaran & Bougie, 2016).

Out of 200 respondents, 62.5% (n=125) were males while 37.5% (n=75) were females. All respondents belonged to generation Z category and were employed (n=200).

The mean value for the purchase intention of Facebook users was 4.37 and the standard deviation was 0.812. There was a strong positive relationship between the consumer's purchase intention via Facebook and the likes (r=0.999, P=0.000), friend's likes (r=0.987, P=0.000), comment posting (r=0.967, P=0.000), sharing (r=0.992, P=0.000) (Table 1).

Table 1: The Correlation Table

Variable	Pearson Correlation Coefficient	P – Value
Likes	0.999	0.000
Friend's Likes	0.987	0.000
Comment Posting	0.967	0.000
Sharing	0.992	0.000

Table 2: The Coefficient Table

Model	Coefficients			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	B		
(Constant)	0.145	0.032		4.504	0.000
Likes (L)	0.223	0.062	0.228	3.631	0.000
Friends likes (FL)	0.217	0.041	0.232	5.290	0.000
Sharing (S)	0.367	0.069	0.377	5.319	0.000
Comment posting (CP)	0.162	0.025	0.168	6.540	0.000

Generation Z consumers' fast food purchase intention was predicted based on the following formula,

$$\text{(Generation Z consumers' fast food purchase intention = 0.145+ 0.223L+ 0.217FL+ 0.367S+ 0.162CP+ e)}$$

According to Table 2, sharing had the strongest influential factor with the consumer's purchase intention (B=0.367) while the least influential factor was comment posting (B=0.162).

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin – Watson
4	0.995	0.990	0.990	0.08209	1.655

According to Table 3, the R² value highlights that the explanatory power of the independent variables in this study accounted for 0.990 which indicates that the study variables such as likes, friend's likes, comment posting and sharing account for 99% for generation Z consumers' fast food purchase intention. Similarly, adjusted R accounted for 99%, summing up that, likes, friend's likes, comment posting and sharing on Facebook has a great impact on generation Z consumers' fast food purchase intention.

Discussion

The current study indicated that sharing on Facebook had the highest impact on generation Z consumer's fast food purchase intention. Similarly, Appel et al. (2020) discovered that the social media factor "sharing" had a positive impact on customers' purchase intentions.

Further, Samarasinghe (2021) reported that "sharing" had a positive impact on customers' purchase intention ($t=5.913$, $p<0.05$) in a study done with the generation Y and Z in Colombo district, Sri Lanka, respectively.

According to Richard and Guppy (2015), "likes" on social media factor had a positive impact on customers' purchase intention ($R^2=0.423$, $p<0.001$). Further, Appel et al. (2020) also reported that "likes" had a positive impact on customers' purchase intention. According to the findings of the current study, in keeping with previously published reports, "likes" has the second highest impact on generation Z consumers' fast food purchase intention.

Jamil et al. (2022) reported that the social media factor "friends' likes" had a positive impact on customers' purchase intentions ($t=2.873$, $p<0.05$). In addition, Samarasinghe (2021) also reported that "friends' likes" had a positive impact on customers' purchase intentions in generation Y and Z consumers in Colombo district. In accordance with previously published results, the current study also reports that, "friends' likes" had the third most influential factor on generation Z consumers' fast food purchase intention.

Samarasinghe (2021) reported that the social media factor "comments" had a positive impact on customers' purchase intention ($t=3.483$, $p<0.05$). Furthermore, Appel et al. (2020) concluded that "comments" had a positive impact on customers' purchase intention, and the current study emphasizes the least impact of "comments" on generation Z consumers in

fast food purchase intention compared to other variables in this study.

In this regard, the research study pinpoints the importance on analyzing the generation Z consumers' purchase intention as this generation is widely recognized for their propensity towards extensive digital connectivity (Lina, Hou and Ali, 2022). Generation Z consumers demonstrate a notable inclination towards depending extensively on peer endorsements and online evaluations when determining their purchasing choices (Khadar, 2020). Social media platforms, such as Facebook, possess the capacity to contribute to this phenomenon by enabling users to disseminate commendations, assessments, and personal encounters pertaining to various commodities (Lina, Hou and Ali, 2022). Further, this study confers the gap in existing literature, revealing the impact of Facebook on generation Z consumers' fast food purchasing intention.

Conclusion

The study's findings emphasize the importance of Facebook marketing in influencing consumers' fast food purchase intentions. Accordingly, the most influential Facebook factor on generation Z consumer's fast food purchase intention is "Sharing." According to the findings, customers prefer to get recommendations from sharing sources.

Conflicts of Interest

No conflict of interest

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Original Article

Knowledge and Attitude towards COVID-19 Vaccine Booster Dose in Vaccinated Undergraduates in Colombo District: A Cross - Sectional Survey

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Introduction: COVID-19 vaccine booster doses are additionally recommended to broaden the immunological response towards the disease. Conversely, COVID-19 vaccine booster hesitancy was noticed among the Sri Lankan population. Therefore, this study attempted to investigate the knowledge and attitude towards booster doses of the COVID-19 vaccine.

Objectives: To determine the knowledge, attitude, and hesitancy towards booster doses of the COVID-19 vaccine among the undergraduate population in the Colombo district.

Methodology: A descriptive cross-sectional study was conducted among 385 undergraduates in the Colombo district using a convenient sampling technique. Data were collected using a pre-tested, self-administered questionnaire. SPSS version 25 was used for the analysis of the study.

Results: Among the total participants (n=385), most respondents had good knowledge (n=198, 51.4%) regarding COVID-19. However, most participants had a neutral attitude (n=156, 40.5%) toward the COVID-19 vaccine. More than half of the participants (n=204, 53%) hesitated about the booster dose. The major factor identified for booster hesitancy was the fear of the side effects (n=119, 50.2%) whilst the least factor was the belief in the ineffectiveness of the booster doses (n=15, 6.3%).

Conclusion: Most of the respondents had good knowledge regarding COVID-19. However, many participants had a neutral attitude toward the COVID-19 booster dose. One of the major reasons for booster hesitancy was the fear of side effects of the vaccine. In this regard, imparting knowledge and increasing good behavioural change toward COVID-19 booster dose is the best solution to reduce hesitancy.

Keywords: COVID-19 vaccine, Knowledge, Attitude, Booster dose, Side effects

Introduction

In the last 20 years, coronaviruses have been related to major disease outbreaks in East Asia and the Middle East. Severe Acute Respiratory Syndrome (SARS) and Middle East respiratory syndrome (MERS) were identified in 2002 and 2012, respectively (Dhama et al., 2020). The novel coronavirus (SARS-CoV-2) which caused COVID-19 was first identified in Wuhan City, Hubei Province, China, on December 2019 (Gralinski & Menachery, 2020).

Until now, several pharmaceutical companies, including Pfizer & BioNTech, Moderna, Gamaleya Scientific Institute, Novavax, AstraZeneca, Johnson and Johnson, and Sinovac have developed vaccines to prevent the spread of COVID-19 infections among the population (Ghasemiyeh et al., 2021). Short-term clinical trials of these vaccines indicated their potency for symptomatic SARS-CoV-2 infections, but substantial evidence confirms that their efficacy declines over time. Thus, vaccine boosters are additional vaccine doses that must be administered to further protect against COVID-19 disease (Moeed et al., 2022).

Less than 50% of the population in Sri Lanka has been vaccinated with a booster dose, while 74% have received at least a single dose of the vaccine (Epidemiology Unit of Sri Lanka, 2023). However, COVID-19 vaccine hesitancy has been one of the top 10 global health issues in recent years. During the initial vaccination campaigns, varying degrees of vaccine hesitancy were reported across the world, given the diverse social and behavioural influences. Fear of the side effects preconceived notions about the vaccine's ineffectiveness, and belief in natural immunity were some of the leading causes of unwillingness to receive the COVID-19 vaccine. In addition, the dissemination of inaccurate information by influential figures, social media, friends and family, instils confusion and fear regarding vaccines. In this context, to forge herd immunity and reduce COVID-19 morbidity and mortality rate, it is critical to achieve vaccination

acceptance (Moeed et al., 2022).

Therefore, by considering the gap in knowledge and the scarcity of literature pertaining to this area of study, this report examined the knowledge and attitudes toward the COVID-19 vaccine and, specifically, the willingness to receive the COVID-19 booster doses.

Methodology

A descriptive cross-sectional study was conducted among 385 undergraduates in the Colombo district. The participants were allowed to voluntarily participate using convenient sampling. The minimum sample size was 384, which was calculated using Open-EPI with a 95% Confidence Interval, 50% of the distribution and a 5% margin of error (Moeed et al., 2022).

$$n = \frac{Z^2 P (1 - P)}{d^2}$$

n = sample size

Z = Confidence Interval of 95% (1.96)

P = 50% Distribution

d = margin of error

The questions precisely covered the respondents' basic knowledge of COVID-19 regarding its transmission, protection, and knowledge about vaccines. For the Likert scale, if "Agree" was the correct answer, then "Agree" was scored as 3 points while "Neutral" and "Disagree" were scored 2 and 1 point respectively or otherwise reverse. The score varied from 0-18 points and all individual answers were summed up for total and calculated for means. For total knowledge score calculation, a score of less than 10 was considered poor, 11-13 denoted a moderate level, and more than 14 was considered good.

The next part of the questionnaire covered the attitudes toward the COVID-19 vaccine and perception of the COVID-19 vaccine. Each correct attitude item reported was awarded a score of 1 point. The incorrect attitude item was awarded a 0 score (including "No" and "No idea"). The score varied from 0-3 points and was

classified into 3 levels; less than 1 with a negative attitude, 1-2 denoted a neutral attitude, and 2-3 was considered a positive attitude. Further, the questionnaire assessed the willingness and hesitancy of the COVID-19 booster vaccine about the acceptance of the booster vaccine, side effects from vaccines, severity of side effects, and future acceptance of booster vaccine.

To ensure the quality and reliability of the questionnaire, a pretest was conducted among 20 undergraduates. Data analysis was done in IBM Statistical Package for Social Sciences (SPSS) version 25. The Knowledge and Attitude scores regarding the COVID-19 vaccine were expressed as mean and standard deviation (SD). Ethical approval was obtained from the ERC of KIU (KIU_ERC_22_088).

Results

Socio-demographic characteristics of the population

Demographic factors are represented in Table 1. Among the 385 participants, 200 (51.9%) were female students and 185 (48.1%) were male students, where 233 (60.5%) participants were within 20 to 24 years and 375 (97.4%) were unmarried. Of the participants, 229 (59.5%) were Buddhist and 70 (18.2%) were Hindu. Participants from private universities were 221 (57.4%) while participants from government universities were 164 (42.6%).

The highest number of respondents were from the Faculty of Health Sciences (n=195, 50.6%) and the Faculty of Medicine (n=107, 27.8%). Among them most of the respondents were from 4th year (n=147, 38.2%) and 2nd year (n=145, 37.7%). The majority of the students were living in boarding places (n=144, 37.4%), followed by living with parents (n=125, 32.5%), hostels (n=112, 29.1%), and relatives' homes (n=4, 1%). Most of the undergraduates (n=93, 24.2%) had a monthly income of the family between LKR 60,000-80,000. The majority of the undergraduates (n=361, 93.8%) were not

suffering from long-term illnesses.

Table 1: Demographic characteristics of study participants (n=385)

Socio-demographic data		Frequency	Percentage (%)
Gender	Male	185	48.1
	Female	200	51.9
Age	20 – 24 years	233	60.5
	25 – 30 years	152	39.5
Civil status	Married	10	2.6
	Unmarried	375	97.4
Ethnicity	Buddhist	229	59.5
	Christian	27	7.0
	Hindu	70	18.2
	Muslim	59	15.3
University category	Government university	164	42.6
	Private university	221	57.4
Study stream	Faculty of Architecture	1	0.3
	Faculty of Education	4	1.0
	Faculty of Engineering and IT	36	9.4
	Faculty of Health Sciences	195	50.6
	Faculty of Law	2	0.5
	Faculty of Management	32	8.3
	Faculty of Medicine	107	27.8
	Faculty of Natural & Physical Sciences	8	2.1
Academic year	1 st Year	40	10.3
	2 nd Year	145	37.7
	3 rd Year	42	10.9
	4 th Year	147	38.2
	5 th Year	11	2.9
Accommodation method	A boarding place	144	37.4
	Own home	125	32.5
	Relation's home	4	1.0
Employment status	University hostel	112	29.1
	Full-time	34	8.8
	Part-time	57	14.8
	Training / Internship	32	8.3
	Unemployed	262	68.1
Monthly income of the family	Below LKR 40,000	61	15.8
	Between LKR 40,000-60,000	82	21.3
	Between LKR 60,000-80,000	93	24.2
	Between LKR 80,000-100,000	74	19.2
	Over LKR 100,000	75	19.5
Suffering from long-term illness	No	361	93.8
	Yes	24	6.2

Knowledge of undergraduates on COVID-19

According to Table 2, 94.5% (n=364) of the participants were aware of the spread of COVID-19 by respiratory droplets. Less than half of the participants (n=184, 47.8%) believed that COVID-19 spread through animals. Among the participants, 93.2% (n=359) were aware that personal protective equipment (PPE) protects from COVID-19 while 89.6% (n=345) of the participants were aware that asymptomatic carriers can transmit COVID-19 to others. More than half of the participants (n=208, 54.0%) had low fear related to the side effects of the COVID-19 vaccine. Less than half of the participants (n=166, 43.1%) believed that the booster dose is effective in protecting from COVID-19 while 41.3% (n=159) believed that the booster dose is safe to receive. Over one-third of the participants (n=144, 37.4%) believed that natural immunity can protect from COVID-19 while 24.4% (n=94) believed that 1st and 2nd

doses were enough to protect from COVID-19.

Table 2: Distribution of knowledge statement

Knowledge statements	Frequency	Percentage (%)
COVID-19 spreads by respiratory droplets		
Yes	364	94.5%
No	4	1.0%
No idea	17	4.4%
COVID-19 spreads through animals		
Yes	184	47.8%
No	127	33.0%
No idea	74	19.2%
PPE protects from infection		
Yes	359	93.2%
No	11	2.9%
No idea	15	3.9%
Asymptomatic act as carriers		
Yes	345	89.6%
No	12	3.1%
No idea	28	7.3%
Level of fear accompanying side effects		
High fear	52	13.5%
Low fear	208	54.0%
No fear	125	32.5%
Booster dose is effective in protecting from COVID-19		
Agree	166	43.1%
Disagree	72	18.7%
Neither agree nor disagree	147	38.2%
It is safe to receive COVID-19 booster vaccine		
Agree	159	41.3%
Disagree	77	20.0%
Neither agree nor disagree	149	38.7%
Natural immunity can protect from COVID-19		
Disagree	83	21.6%
Agree	144	37.4%
Neither disagree nor agree	158	41.0%
1 st and 2 nd doses are enough to protect from COVID-19		
Disagree	83	21.6%
Agree	94	24.4%
Neither disagree nor agree	208	54.0%

Thus, the mean undergraduate knowledge score was 13.32 with a standard deviation (SD) of ± 2.15 . Therefore, the results reflect that the majority of respondents had good knowledge (n=198, 51.4%) regarding COVID-19. A moderate knowledge level was seen among 37.4% (n=144) of respondents and 11.2% (n=43) of the respondents had poor knowledge.

Attitude level of undergraduates on COVID-19

The majority of the respondents (n=267, 69.4%) mentioned that there is a low possibility of getting infected with COVID-19 after vaccination. Most of the undergraduates (n=362, 94.0%) had a positive opinion on isolating them when infected with COVID-19. Among the participants, 57.4% (n=221) did not believe the fact that vaccination reduced the risk of COVID-19 infection while 42.6% (n=164) believed that vaccination reduced the risk of COVID-19 infection.

Thus, the mean attitude score is 1.1 (SD = 0.77). Nearly half of the respondents (n=156, 40.5%) had a neutral attitude toward COVID-19 vaccination. While 34.3% (n=132) of respondents had positive attitudes and 25.2% (n=97) had negative attitudes toward COVID-19 vaccination respectively.

Willingness to receive booster doses

Most of the participants did not receive a booster dose (n=204, 53%) while the rest of the participants received a booster dose (n=181, 47%). Whereas 11% (n=41) only received 1st dose and 42% (n=163) received 1st and 2nd doses, 46% (n=177) received 1st, 2nd, and 3rd doses, and 1% (n=4) received 1st, 2nd, 3rd, and 4th doses of COVID-19 vaccine.

Among the participants who did not receive the booster vaccine dose (n=204, 53%), 86% (n=178) mentioned they were not willing to receive a booster dose while 14% (n=28) participants were willing to receive a booster dose. Accordingly, more than half of the population had taken Sinopharm as their 1st (n=280, 72.7%) and 2nd (n=243, 63.1%) dose. The majority of the undergraduate population had taken Pfizer as the booster dose (n=139, 36.1%).

Of the participants (n=204, 53%) who did not receive the booster doses mentioned fear of side effects (n=119, 50.2%); belief that the first two doses are enough to protect from COVID-19 (n=62, 26.2%); infected with COVID-19 after vaccination (n=24, 10.1%); presence of chronic illness (n=17, 7.2%); and belief that the booster is not effective (n=15, 6.3%) as the reasons for not receiving the booster doses. Most of the respondents were not willing to receive booster doses in the future (n=237, 62%). While the rest of them were willing to receive upcoming booster doses in the future (n=148, 38%).

Discussion

COVID-19 has been a pandemic for more than three years and even people from rural areas are

aware of COVID-19 because of media and social media platforms (Sujarwoto & Maharani, 2023). A study conducted in Indonesia and Taiwan revealed a good knowledge level among the study population (Huang et al., 2023; Sujarwoto & Maharani, 2023). Similarly, in the current study, the majority of the participants had good knowledge (n=198, 51.4 %) about COVID-19 vaccination and the booster dose. This could be due to the fact that most of the participants were from the Science or Health associated departments such as Health Sciences, Medicine, Natural and Physical Sciences.

A study conducted by Alhassan et al. (2021) in Ghana found increased negative attitudes toward COVID-19 vaccine. In the current study, many participants had a neutral attitude (n=156, 40.5%) toward accepting a COVID-19 vaccine booster dose. However, several studies have found a higher proportion of positive attitudes towards COVID-19 vaccines (Hajure et al., 2021; Klugar et al., 2021; Babicki et al., 2021; Pal et al., 2021; Tahir et al., 2021).

The study revealed that 53% (n=204) of the undergraduate population were hesitant towards getting the COVID-19 vaccine despite having a good knowledge level of the COVID-19 vaccine. Interestingly, 86% (n=176) of undergraduates were not willing to receive booster doses for this population and this is a serious concern in carrying out a successful immunization program towards COVID-19.

Another survey conducted in Sri Lanka revealed a similar percentage of hesitancy towards booster doses of COVID-19 (59%) with a sample size of 601 (Dunuwila et al., 2023). Hence, in keeping with the results of this study, there seems to be a lack of acceptance of the COVID-19 vaccine and boosters especially in this population group. A study by Lazarus et al. (2021) from Algeria reflected similar hesitancy percentages and identified vaccine acceptance rates below 55% in Russia. In comparison, the literature has found that vaccine hesitancy rates range widely across populations and countries. Some reports

show a higher acceptance rate for third booster doses: China (84.80%), Jordan (70%), and UAE (70.2%) (Lai et al., 2021; Al-Qerem et al., 2022; Jairoun et al., 2022).

The study revealed that most of the participants were hesitant towards booster dose due to fear of side effects (n=119, 50.2%), and belief that the first two doses are enough to protect from COVID-19 (n=62, 26.2%), as the reasons for not receiving the booster doses. A similar study in China stated that the most common reason for not accepting booster vaccination was concerns regarding the vaccine safety (21.4%), the belief that the first two doses are enough to protect from COVID-19 (14.3%), and concern about vaccine efficacy (10.2%) and side-effects (21.1%) (Lai et al., 2021). A study conducted in Jordan mentioned the reasons for booster hesitancy as; the booster dose is not effective (39.8%), the belief that the first two doses are enough to protect from COVID-19 (24.6%), while yet another proportion did not take the vaccine because of the fear of getting infected with COVID-19 after vaccination (13.1%) (Al-Qerem et al., 2022). A study by Bianchi et al. (2022) showed that the low vaccine acceptance rate in Japan, Greece, Italy, Malaysia, Brazil, and Australia was primarily due to concern about vaccine safety and side effects (Bianchi et al., 2022).

Conclusion

In conclusion, knowledge regarding COVID-19 was good despite the neutral attitude towards the COVID-19 booster vaccine within the study population. It can be concluded that fear of side effects, the belief that the first two doses are enough to protect from COVID-19 and getting infected after vaccination as the major factors influencing the reluctance to receive COVID-19 vaccine booster doses.

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Conflicts of Interests

There are no conflicts of interest.

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Original Article

An analysis of the importance of pursuing the BA Hons (English) degree programme in Sri Lanka

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Abstract

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Introduction: Second language learning has become a socially valued vital learning process since it has the influencing potential to form, manipulate and change the social individual identities towards positive recognition. In Sri Lanka, English has become the most prestigious language in society and competence in English is required as the most obligatory qualification for a person to be recognized in society. Thus, the educational process of learning English as a second language has become a highly acknowledged and vital section of the Sri Lankan educational system.

Objectives: The study aimed to analyze the impact of the BA (Hons) in English programme in facilitating individuals with a pedagogy through which they will be able to enrich their knowledge of the study of language, fields of linguistics, diverse domains of literature, philosophy and research.

Methodology: The study was conducted as secondary research and within the secondary data collection process, the information was gathered and analysed discursively based on selected secondary sources of information such as scholarly articles, books, reports etc. The theoretical perspectives and ideologies of Bonny Norton, Pierre Bourdieu, Chris Weedon, Susan M. Gass, Larry Selinker, Dudley-Evans, Maggie Jo St John etc. were applied.

Results: Literature studies are considered an integral part of the BA English curriculum since they can be considered a source which triggers social empowerment and develops critical and analytical skills of the students while enabling them to perceive the world through diverse perspectives. Computational linguistics, an emerging science in the current educational sphere, strengthens the quality of the BA Hons in English degree programme by facilitating the coordination between two disciplines, linguistics and computer science, in producing an innovative language teaching and learning platform embedded with computer applications and programs. The undergraduates who follow the BA English degree programme are expected to develop communication skills in English and other competencies which are needed for lifelong learning.

Conclusion: The Bachelor of Arts in English degree can be identified as the most productive educational programme in providing students with a greater improvement from communicative competence to mastery of English proficiency. It was observed that graduates with a BA in English are given more preference than conventional business-minded graduates since English graduates are identified as super thinkers, individuals with skills in teamwork, problem solvers with rich analytical skills and risk takers who handle challenges strategically.

Keywords: English language needs, BA(Hons) in English, Employability

Introduction

Second Language Acquisition is a process where an individual learns a new language that differs from his or her first language (mother tongue) depending on diverse phonetic, phonological, morphological, syntactical and semantic features that can be observed within the two distinct language structures. Consequently, language learners build a relationship with the second language endeavouring to enhance their knowledge and language skills while encountering the complications arising from the mother tongue interference. Within this educational process where the individual makes himself familiar with the second language and the particular linguistic components of that language, has to interact with the culture, societal environment and ideologies that exist in connection with that novel language which introduces the learner to a totally different atmosphere. Through this exposure to a new language experience, the learner gains the ability to perceive the diversities that exist between languages and develop his awareness of the construction and practice of the varied language patterns. The individuals who are involved in the process of learning a second language tend to develop different perspectives due to the complexities that they encounter and based on their capability to surmount those difficulties they will either become motivated by having positive attitudes or demotivated by perceiving the learning process through negative notions. Since language plays an integral role within the social sphere in enabling communication between individuals and is utilized as the intermediate channel through which thoughts are given the form of expression and each object is defined, it tends to influence the development of individual personalities and the relationship of the individuals within the larger social world.

As Gass and Selinker (2008) exemplify second language refers to any language learned in addition to a person's first language; although the

concept is named second language acquisition, it can also incorporate the learning of third, fourth, or subsequent languages. Within the Sri Lankan societal atmosphere while the Sinhala language functions as the official language reflecting the authoritative characteristics, the position that the English language is assigned tends to remain in diverse dimensions as a result of the diverse socio-political consequences, cultural prejudices and the different concepts and attitudes of the individuals towards the learning and communicating in the English Language.

In Sri Lankan social system while Sinhala and Tamil languages have been recognized as the first languages of most people, English functions as the second or target language. Through a gradual social transformation English has become the most prestigious language in society and competence in English is required as the most obligatory qualification for a person to be recognized in society. Thus, the educational process of learning English as a second language has become a highly acknowledged and vital section of the Sri Lankan educational system (Amarasooriya, 2017). Therefore, providing individuals with a productive and enriching educational platform to enhance their English knowledge on a wider scale can be emphasized as a dire necessity since English is required to interact with international communities in the modern context. Thus, introducing a BA (Hons) in English programme will facilitate individuals with a pedagogy through which they will be able to enrich their knowledge of the study of language, fields of linguistics, diverse domains of literature, philosophy and research.

Accordingly, in developing a BA Hons in English programme, the requirements of the labour market, the available career opportunities for the graduates with a BA Hons in English and the recognition given for the degree programme in the social context need to be taken into thorough consideration. Within the process of developing a curriculum, learner centred approach is applied

since that focuses on the learner's requirements and expectations, in particular, their needs are analysed prior to the designing stage (Dudley-Evans & St. John, 1998; Hutchinson & Waters, 1987; Silva & Devendra, 2014). As Silva and Devendra (2014) stated, through analysing the needs of the students/target group and identifying their requirements, the objectives, methodology, design of the programme, assessment and evaluation can be decided in order to develop the programme more productively. According to a study conducted by Sardi (2014), it was observed that the respondents hold a strong stance on the vitality of the role of English since it is the major global language and they have the opinion that they will be able to reach their career goals if they have proficiency in English to a satisfactory level (Sardi, 2014).

According to several research conducted focusing on the Sri Lankan labour market, (Ariyawansa, 2008; Brunfaut & Green, 2019; Wijewardene, Yong & Chinna, 2014) English and communication skills have been identified as the top job requirements in the labour market, especially in considering the perspectives of the employers. Moreover, English and communication skills are given a high value as the most vital soft skills which are needed in the service-oriented economies in South Asian countries to enhance the competitiveness of the workers, in particular in the business process outsourcing and hospitality sectors (The Economist Intelligence Unit, 2013). According to the research conducted by Brunfaut and Green (2019), it was identified that 50% of employers were of the opinion that due to low competency in communication skills, it is difficult to recruit qualified employees. The major impediments were observed in relation the fluency in the English language, especially in the areas of written and oral communication. Further, it was identified that due to the low level of written and communication skills in English, individuals show less confidence in communicating in English. Of 85% of the respondents who mentioned that

proficiency in English is a required qualification in recruiting employees, 41% stated that English is an essential requirement for all employment categories. Further, 59% mentioned that proficiency in English is a highly value-added requirement for managerial and supervisory positions and also for the employment sectors such as human resources, marketing, IT, business development, engineering, customer relations etc. In collaborating with external professional bodies, coordinating with internal and external parties, delivering presentations, making negotiations, engaging in merchandising processes and adhering to global trends, demands and innovations, proficiency in English is an essential component since it plays a dominant role in the acquisition of employment, power and privilege in the society (Brunfaut & Green, 2019; Ranasinghe & Ranasinghe, 2012).

In Sri Lanka, the limitations in English language proficiency were observed in the areas of communication such as writing, speaking and reading, developing formal reports and letters, spelling and grammar accuracy and oral communication. As a result of these limitations and gaps in proficiency in English, the Sri Lankan economy and labour market were confronted with diverse issues (Brunfaut & Green, 2019). Thus, the inability to adhere to modern technological advancements, lack of modernization, low level of employability, less incompetence in interacting with the international market sphere, lack of opportunities to integrate into the international supply chains, the decline of the tourism industry, limited collaborations with international communities, fewer development opportunities etc. were identified as the major negative results incurred due to incompetency of English language (Brunfaut & Green, 2019). Therefore, identifying the strategies and developing a productive educational platform to enhance proficiency in the English language requires thorough consideration and implementation of immediate actions.

Literature Review

Sri Lankan society consists of socio-cultural and socio-economic diversities allowing it to exist as a stratified system and those differentiations and inequalities have fabricated distinct identities for the individuals. Thus, these identities design and define the social status of a person and determine his or her social space and capability to access and achieve the favourable aspects of society. Within this setting the English language functions as an identity formation tool which enables individuals to advance towards positive social recognition (Amarasooriya, 2017).

In Sri Lankan social context English has been assigned several validities within diverse communal groups and the attitudes that the individuals have towards English tend to vary to a greater extent depending on the societal diversities.

As Wijeratne (2015) draws attention to the significance of this phenomenon, 'In present-day Sri Lanka, the government is dedicated to providing an English education to its entire population, with new language policies giving high importance to English as a language of international importance.'

Exposure to globalization and the recognized status assigned to the English Language as the lingua franca has persuaded the Sri Lankan education system to consider English as the medium of instruction. Thus, schools and universities adopted several measures to restructure their curricula incorporating English as the medium of instruction (Ranasinghe & Ranasinghe, 2012). According to the World Bank (2009), the lack of English language proficiency, especially the lack of communicative competence in English among Sri Lankan graduates and undergraduates has been identified as a major deficiency since that issue impacts their employability negatively. This leads graduates to be unemployed since the labour market

especially the private sector demands a high level of English language proficiency in recruiting employees. The tourism, IT and business sectors give prominence to the English language since that is the main component through which the linkages can be developed with the international market and other global bodies. In dealing with multinational companies, English functions as a bridging language which interconnects all the international branches with the main company. As the language of international communication and business, the penetration of English into Sri Lankan society has created a high demand for English proficiency among Sri Lankans and has paved the way for educational institutes to develop diverse English programmes to enhance the English language skills of school students and undergraduates (Brunfaut & Green, 2019; Ranasinghe & Ranasinghe, 2012).

Development of English education programmes requires prior investigation into the current social demand and recognition given to the English language, diverse proficiency levels of students, students' perceptions about the mastery of the English language, limitations that exist in enabling students to obtain high proficiency levels in English, language components and areas in which students show poor performance and specific language requirements of the students. When the prevailing social condition is properly identified, inventing a strategic approach will be more productive. According to a test of English proficiency conducted by the Post Graduate Institute of English to measure the proficiency levels of undergraduates in Management/Accountancy, Social Sciences, Engineering and Science, it was identified that English writing was the weakest area that students need to focus on improving. Further, graduates with an art degree and also from a rural background encountered challenges in competing in the job market and obtaining employment due to their incompetence in the English language and lack of confidence. Moreover, individuals who completed their secondary or tertiary education

in Sinhala or Tamil languages also encountered marginalization due to their incompetence in English (Ranasinghe & Ranasinghe, 2012).

Society employs language as a measuring device to evaluate the validity of an identity of a person within specific social strata to accept or negate one's existence within the community. Within the social system where diverse social classes exist with their particular characteristics, several conflicting relationships can be observed among the groups. While the larger social group maintains the authority upholding their cultural and social identities, their language is given a dominant role thus implementing it as the main language of education, business, law, politics etc. As a result of this authoritative status offered to the role of language, it operates as one of the guarding gates which grant permission to the individual to enter into the prestigious dominant social class. As a result of this social milieu the individuals who use minor unrecognized languages and who are incompetent in the dominant language are marginalized and downgraded.

'.....I take the position that power does not operate only at the macro level of powerful institutions such as the legal system, the education system and the social welfare system, but also at the micro level of everyday social encounters between people with differential access to symbolic and material resources – encounters that are inevitably produced within language' (Norton, 2000).

Consequently, the National Education Commission identified the necessity to strengthen English education in Sri Lanka and expand opportunities in universities to introduce novel English education programmes to produce more employable graduates who can distinguish themselves in the job market (Ranasinghe & Ranasinghe, 2012). Further several issues were noted in relation to the facilities and the quality of English education in Sri Lanka. Thus, it was brought to the attention that the English training

that is provided through GCE Ordinary and Advanced level curricula is not standard since they are at the elementary level and certificate programmes in English do not provide quality language training to enhance communicative competence in English to enable individuals to meet the international standards (Brunfaut & Green, 2009). Hence, emphasis can be placed on the necessity of developing a more advanced and quality English education programme with a standard curriculum while adhering to the Sri Lanka Qualifications Framework with the objective of improving the employability of graduates to meet the demands in the national and international labour market.

Methodology

Within the secondary data collection process, the information was gathered and analysed discursively based on selected secondary sources of information. Consequently, 20 research studies, scholarly articles in indexed journals, reports and books that were published from 1987 to 2022 on the subjects of second language learning, the significance of the English language in improving the employability of graduates and the role of English in the Sri Lankan context etc were referred. The key words such as the importance of BA in English degree programme, English and employability, English in the Sri Lankan university system, the vitality of literary studies, modern language modules, English and labour market etc. were utilized.

In discussing the pivotal themes and issues in relation to second language learning, identity and the dominant role of English as the international language, the fundamental theories were applied focusing on the formation of social identities of the individuals through the influence of learning English as a second language. Consequently, the theoretical perspectives and ideologies of Bonny Norton, Benedict Anderson, David Block, Pierre Bourdieu, Chris Weedon, Zoltan Dornyei, Susan M. Gass, and Larry Selinker etc. were

given thorough consideration in applying those concepts to critically analyse the contemporary phenomena and consequences in relation to the process of learning English as a second language. Further, analysis of the secondary sources was conducted by categorizing the selected information thematically and summarizing significant details, synthesizing and drawing conclusions.

Results

English as a constructive and influential societal tool has been utilized as a fundamental criterion within the Sri Lankan context to allow individuals to access higher social positions, fabricate new identities and elevate their identities within the social hierarchy. Accordingly, English and higher education maintain an intimate linkage within the university system since the medium of teaching and learning mostly happens to be English and it is one of the most advanced and recognized places for individuals to enhance and empower themselves with English knowledge. Thus, the perspectives of the undergraduates with regard to the impact of English on higher education are vital since they have been familiarizing themselves with English since their primary and secondary education and they have encountered diverse social experiences in relation to the role of English within the Sri Lankan social context. The research studies conducted in the area of second language learning and the dominant role of the English language and its impact on career mobility (Amarasooriya, 2017; Ranasinghe & Ranasinghe, 2012), observe that the majority of the undergraduates believed that a high level of proficiency in English is the most required and decisive factor for career advancement. According to Ranasinghe & Ranasinghe (2012), 93% of the respondents were of the opinion that excellence in English communication skills is highly required to secure attractive employment while 98% stated that proficiency in English enables individuals to compete with improved employability in obtaining varied employment

opportunities. Moreover, 72% of the respondents mentioned that a high level of English language competency influences career advancement. As Amarasooriya (2017) stated 92% of the undergraduates who participated in the research had the positive perspective that English is highly necessary for pursuing higher education. Further, it was observed that less proficiency in English create social barriers for undergraduates to aspire to achieve their goals and that limitation restrict their career mobility and choice (Ranasinghe & Ranasinghe, 2012).

A Bachelor of Arts in English degree can be identified as the most productive educational programme in providing students with a greater improvement from communicative competence to the mastery level of English proficiency (Sárdi, 2014). According to the University of IOWA (2013), a degree in English language and literature gives a prime focus on developing the skills that are required to obtain personal and economic success. Those skills are excellent reading skills while focusing on textual details, analytical thinking, effective communication skills both in oral and written methods, critical thinking skills, research skills, creativity, English language skills, ability to develop new ideas and projects, technology skills in pedagogy, teaching skills etc. (López & Velázquez, 2019; University of IOWA, 2013). It was observed that graduates with a BA in English are given more preference than conventional business-minded graduates since English graduates are identified as super thinkers, individuals with teamwork skills, problem solvers with rich analytical skills and risk takers who handle challenges strategically. These skills were defined as not only vital and impressive for employers, but also essential skills to enrich human lives (University of IOWA, 2013). Contrary to the general and traditional courses of study which produce graduates who are unable to cope with the evolving trends of the global world and who are unable to adhere to the changes in the modern context, the English course of study aims to cultivate the potential in

the graduates to critically analyse the real world scenarios and lead them to be socially engaged individuals who can interpret multiple viewpoints and perspectives (University of IOWA, 2013).

Amidst the number of employment opportunities that BA graduates are qualified for, the teaching/lecturing profession is highly popular and recognized. The English degree programme provides graduates with technical skills as well as transferable skills to become competent teachers with profound pedagogical knowledge. Thus, the knowledge and practice of curriculum planning, assessment, reflective teaching, innovative teaching strategies, language acquisition and classroom management which are needed by professional teachers (Borg, 2006) are provided by the English course of study (López & Velázquez, 2019). The undergraduates who follow the BA English degree programme are expected to develop communication skills in English and other competencies which are needed for lifelong learning. Further, enhancing autonomy, adaptability, and ability to handle responsibilities while focusing on training students to develop language skills to enhance their teaching skills and perform effectively in diverse workplaces are considered beneficial attributes of the BA English degree programme (López & Velázquez, 2019). Students gain the ability to improve their critical thinking skills through engaging with self-reflection, questioning the ideas presented in texts and thinking differently moving away from the traditional pattern of learning. Research skill is another major component which is given focus in the English course of study since research skills are needed for students to investigate educational issues and other social issues which require their attention. It was observed that the majority of the graduates of the BA English degree programme became autonomous (López & Velázquez, 2019) and during the programme, the students are encouraged to develop autonomy in decision-making and attending real-world situations. The development of language skills can be recognized as one of the most vital effects

of the programme and graduates have become more confident in their language skills which can directly have a positive impact on their career choice and mobility. Another significant aspect of the BA English degree programme is it aims at developing the motivation of the graduates towards continuous professional development. Thus, with motivation and guidance provided by the English course of study, graduates become inspired to follow post-graduate programmes such as MA and PhDs since that provides them with the opportunity to expand their knowledge in the field, gain a deeper understanding of the subject area and engage in research work.

Discussion

Literature studies are considered an integral part of the BA English curriculum since they can be considered a source which triggers social empowerment and develops critical and analytical skills while enabling them to perceive the world through diverse perspectives. Further, it was emphasized by several scholars that English literature possesses the scope of studying the nature of literary narratives, the usage of language and the reflection on culture. It has the potential to strengthen the development of self-knowledge, self-expression and, most importantly, enhance democratic citizenship (Dodou, 2020). The intersection between studying literature and the value of higher education has to be properly analysed in identifying the areas of literary studies that should be included in the higher education curriculum. The nature, value and purpose of studying literature and the knowledge that is disseminated through the course of study should be properly defined before the curriculum development. Further, strategic decisions need to be taken on what subject areas should be taught, which specific knowledge should be disseminated and the composition of the curriculum should logically reflect and answer the question 'Why study literature' (Dodou, 2020). According to Dodou (2020), the majority of the BA English degree programmes offer

introductions to Literature in the first year and they are comprised of modern and contemporary literature modules. The second-year modules tend to teach survey courses in literary history focusing on literature from the Renaissance to the 20th century. The third year focuses on teaching the BA thesis courses and specialised thematic courses in literature. Thematic literary modules aspired to teach literary history, theory and criticism. Along with that academic writing modules and introductory theory modules are offered to enhance literary studies. The literature modules aim at developing knowledge about literary genres and themes, improving disciplinary knowledge on engaging with literary texts, interpreting cultural expressions and enhancing the contextual knowledge of culture, socio-historical events, phenomena and perspectives. Further through the development of contextual knowledge and understanding of the diverse cultural milieus, the students improve their awareness of global issues and phenomena. The BA in English degree focuses on incorporating literary conventions and literary characteristics of modernism, post-modernism, realism, renaissance and romantic literature. Further, thematic modules such as postcolonial literature, world literature and courses on genre fiction such as children's literature are included (Dodou, 2020). Through teaching literature modules, students are given the understanding that literary work provides complex responses to intellectual, cultural and material conditions. Further students are enabled to analyse the literary works based on the knowledge they have of the literary periods, conventions and characteristics. Significantly literary studies prioritize guiding students to investigate and observe cultural mentalities and socio-political matters with rationalistic and innovative approaches. Thus, they inspire them to realize how literature reflects and addresses social realities such as identity, ideology and equality (Dodou, 2020). Another significance of English curricula is they give more attention to developing critical reading and interpretation skills of the students guiding them to read the

literary texts more closely and sensitively (Dodou, 2020). The majority of the BA English curriculums emphasize the significance of theory and theoretical applications for literature studies. According to Dodou (2020), the following theories such as Postcolonial theory, Literary and cultural theory, Gender studies, Feminist theory, Narrative theory, Poststructuralism, Cultural studies, Ecocriticism, Postmodernist theory, Psychoanalytic theory, Marxism, Structuralism are mostly used in the curricula. Through teaching theoretical approaches, students' ability to identify the theories in the social, cultural and ideological contexts and comprehend the theoretical approaches in diverse socio-cultural contexts are enhanced. This inspires them to engage in applying the theoretical approaches more argumentatively in analyzing sociocultural and political matters, expanding their intellectual capacity.

Familiarizing the students with the cultural context, histories and values of English-speaking societies is promoted through literature modules and by allowing them to understand the multicultural elements in the English world, their ability to develop literary analysis on the social conditions, cultural mentalities and political ideologies of those communities is strengthened. (Dodou, 2020). The development of language skills was identified as a dominant practice in English literary studies since it provides the students with the opportunity to enhance their oral communication and writing skills. The production of literary analysis, criticisms and interpretations are utilized to reflect the students' standard of language.

The computational linguistics incorporated into BA English degree programmes standardizes the programme's quality and intensifies its advanced practicality since computational linguistics has emerged as an interdisciplinary field through the interrelation between linguistics and computer science (Seddiki, 2022). Computational linguistics as a module which

is in the intersection of the humanities and hard sciences such as computer science, mathematics, engineering etc. provides the learners with the potential to address the language demands and challenges in language production. This enables the learners to be familiarised with utilizing techniques, systems, methods and applications to create computer models to generate, understand, analyze and synthesise the natural language (Ahmad, 2022; Seddiki, 2022). Since language is the main and most natural mode of communication, using computer systems to facilitate language production assists language learners and teachers in achieving teaching and learning objectives. Further, by being specialists in computational linguistics with expertise in linguistics, the learners can design innovative programmes to produce and treat natural language through computer systems since that discipline encompasses the areas of study of languages, morphology and syntax (Seddiki, 2022).

The area of computational linguistics comprises main components such as speech recognition, speech synthesis, machine translation and dialogue systems. Enhancing knowledge in these fields enables the learners to comprehend the application of computer programmes to generate and produce natural language, transform written form into spoken form and translate one language to another. Further, through gaining exposure to both linguistics and computer science, the learners improve their potential to engage in designing computer systems to analyse texts, produce automatic machine translations, comprehend human language and analyze and organize words for social media and internet use (Seddiki, 2022). Moreover, the learners will gain the competency to utilize computers to comprehend, produce and implement linguistic theories while explaining the fundamental strategies for generating and interpreting natural languages. Most significantly, the promising area of Computer Assisted Language Learning develops knowledge of the students on the usability of the computer for

language teaching and learning process. This field focuses on enabling students to design programmes using computer applications to assist individuals in learning foreign languages (Seddiki, 2022). Hence computational linguistics as an emerging science in the current educational sphere, strengthens the quality of the BA Hons in English degree programme by facilitating the coordination between the two disciplines, linguistics and computer science, in producing an innovative language teaching and learning platform which is embedded with computer applications and programs.

The BA (Hons) English degree programme with the suitability, validity and applicability of the modules in addressing the global demands and challenges, can be upheld as a degree programme which has the potency to contribute to the pedagogy by creating an innovative and creative educational environment that can produce graduates with the employability skills, critical thinking, self-autonomy, analytical skills, competency in computer science and creativity.

Conclusion

The significance of the English language continues to evolve in the Sri Lankan context along with the favourable attitudes that the undergraduates hold towards the English language, and they uphold the common perspective that a high level of proficiency in English is a prerequisite if they need to attain greater academic performance. Further, society perceives the necessity of improving the English language competency of the younger generation while providing them with the necessary awareness of the vitality of the English language as the lingua franca and the language of business in enhancing their employability in the local and global labour market. However, within the Sri Lankan context, the steps and strategies that were implemented in facilitating students with a solid platform to learn English to address the global demands appeared to be less satisfactory and inadequate to

reach the expected level. Therefore, expanding opportunities for students to follow BA (Hons) in English degree programme will be the key to producing graduates who can be empowered to expand the Sri Lankan economy to reach the global territories by addressing the trends

of the international markets, adapting to the foreign cultural demands, strengthening foreign relationships, expanding the business networks, applying modern technology and facilitating the cross-cultural communication.

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