

Brief Communication

Do mobile phones cause hearing and vision complaints? A preliminary report

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Mobile phones are low power radio devices that transmit and receive radio frequency radiation at frequencies in the microwave range of 900-1800 MHz. Despite repeated horror stories about mobile phones in the media, the number of mobile phone users worldwide is approaching one billion. There are 2 direct ways by which health could be affected as a result of exposure to radio frequency radiation. These are thermal (heating) effects caused mainly by holding mobile phones close to the body, and as a result of possible non-thermal effects.¹ Despite apprehensive discussion in electronic and print media about mobile phones, and their effects on different systems of the body observed in different countries, their effect regarding hearing and vision problems in the Saudi population has not been reported yet, where mobile phones are excessively used in such a way that recently another zero digit was added while dialing the mobile number. The aim of this study was to determine the link between the use of mobile phones and hearing and vision complaints in the Saudi population.

The present study was conducted in the Department of Physiology, College of Medicine, King Khalid University Hospital, King Saud University, Riyadh, Kingdom of Saudi Arabia (KSA) during the year 2002-2004. The sample consisted of 437 volunteer subjects recruited from the College of Medicine, King Saud University and from the different areas of Riyadh, KSA. The study sample was predominantly 55.1% male, and 39.9% female, with ages ranging from 18-42 years. A structured questionnaire was constructed particularly for this study in Arabic, and was also translated into English. The questionnaire was designed so that it could be used in a structured interview context or by self-completion. It assessed general physical characteristics, occupation of the participants, medical history and different questions regarding the type of mobile phones, their use, number and average duration of outgoing and incoming calls and duration of exposure to mobile phones. Subjects with known history of gross anemia, diabetes mellitus, high blood pressure, central or peripheral nerve diseases, congenital hearing and vision disorders, subject using any medication or computer professionals were excluded from the study. The data were analyzed by using SPSS program for windows. Clinical findings

comparison was carried out on the basis of mean percentage between the different groups.

The present study results show the health problems associated with duration of incoming or outgoing calls, or both, for respondents as a percentage of total numbers. The associated percentage for complaint of earache, heating around the ear and decreased hearing was 31.2% with duration of calls 5-10 minutes per day; 42.9% with 10-30 minutes; 30.4% with 30-60 minutes; 45% with 60-120 minutes, and 36.4% with more than 120 minutes per day. Similarly, the percentage for decreased or blurred vision, or both were 6.2% with duration of calls 5-10 minutes per day; 3.1% with 10-30 minutes; 2.2% with 30-60 minutes; and 5% with 60-120 minutes per day. The overall complaints regarding hearing were 34.5% and vision problems were 4.8%.

The popular belief is that the mobile phone adverse health affects can be induced by the heating effect of GSM (Global system of mobile communication) radiation. The reported adverse health effects and the extensive portfolio of non-thermal effects that have been published in the scientific literature during the last few years, indicate that the type of radiation now used in GSM phone can and does affect living organisms in various non-thermal ways. Kellenyi et al² reported that exposure to GSM phone radiation caused an increase in auditory brainstem response in the exposed side of human subjects and showed a hearing deficiency in the high frequency range. The present study also supports these results. Ofiedal et al.³ observed sensation of warmth on the ear and behind or around the ear and burning sensations in the facial skin in connection with the use of a mobile phone. Our findings are in conformity with these results. Sandstrom et al.⁴ studied the hazards of mobile phones and reported feelings of discomfort and warmth behind, or around the ear while using mobile phones. Our results are in agreement with these results. In addition, it has been also reported that, 2 Swedish subjects who used a mobile phone extensively for many years, have gone blind in one eye, on the side of the head they use their phone. In one case, symptoms began with intense pain in one eye which was eventually diagnosed as ulcers on the cornea. There are 2 other subjects in the same town who attribute the loss of sight in one eye on the same side of the head they use their mobile phone.⁵

The present study demonstrated a relationship between hearing and vision complaints in subjects exposed to mobile phone emissions. Keeping in view the findings of the present study, it is advisable; therefore, that the use of a mobile phone is a risk factor for health hazards and suggests that

unnecessary use of mobile phones should be avoided by health promotion activities, such as group discussion, public presentations and through electronic and print media sources. In addition, further large sized studies, along with detailed clinical examinations, are needed to study the long-term effects of mobile phone use and hearing and vision disorders.

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Duodeno-jejunal anastomosis with trans anastomotic nasojejunal tube for congenital duodenal obstruction

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Duodenal atresia, severe duodenal stenosis, or both, necessitate an urgent reestablishment of the duodenal continuity, by duodeno-duodenostomy or duodeno-jejunostomy. Calder¹ reported the first description of duodenal atresia in 1773, but Vidal² who performed a gastro-jejunostomy records the first successfully treated case in 1905 in France. The first successful duodeno-jejunostomy was in Denmark performed by Ernst³ in 1914. Duodeno-duodenal or duodeno-jejunal anastomosis may not always function correctly due to some type

of a dystomy of the duodenum as a result of it being so thick and dilated. Neonatal intensive care and total parenteral nutrition have significantly improved the outcome of these patients. Although some studies have reported that the operation of duodeno-jejunostomy with trans-anastomotic stenting is to be reserved for a second time repair of this congenital anomaly,⁴ we stressed in this study our satisfaction with the results of this procedure.

From November 1993 to February 2004, 21 neonates with congenital duodenal obstruction underwent a trans meso-colic duodeno-jejunal anastomosis stented by a 6 French (Fr) trans-anastomotic naso-jejunal feeding tube (TNJT) at Al-Hada Military Hospital, Attaif and King Faisal Specialist Hospital and Research Centre, Jeddah, Kingdom of Saudi Arabia. Anastomosis was always chosen to be at the distal lower aspect of the dilated duodenum. The TNJT is kept in place for 2 weeks. A second decompressive nasogastric tube size 8 Fr is also inserted during the procedure and removed before starting oral feeding on day 4, when simple abdominal radiograph showed the normal intestinal containing air distribution. Epidemiological, clinical, radiological and therapeutic data as well as their postoperative course were abstracted from their files. The complications and the outcome of surgery were also registered. The types of anomalies were defined during surgery. Extrinsic obstruction secondary to malrotation, intra luminal valve and short stenosis was excluded from this study.

First degree of consanguinity was found in 16 cases. Prenatal diagnosis was suspicious in 10 of the 19 cases that underwent a prenatal ultrasound, 10 were associated with polyhydramnios, and prematurity as noted in 11 cases out of 21 (Table 1). The associated congenital anomalies were found in 12 cases, the most common was cardiac in 7/21, Down's syndrome in 7/21, renal anomalies requiring a urology follow up in 2/21, malrotation with atresia in 2/21, musculo-skeletal in 2, and cloacae in one. None of the patients presented with other intestinal atresia or exteriorized biliary tract anomalies. In 19 cases, the postnatal diagnosis was confirmed within the first 48 hours by the presence of the classical radiological double bubble shape. Abdominal radiograph was requested to confirm the prenatal ultrasound finding or as a work up for recurrent vomiting. In the 2 cases of annular pancreas with simple stenosis, the diagnosis was carried out on the fourth and fifth day by contrast meal for feeding intolerance (gastric content copious vomiting occurring shortly after each meal), the simple abdominal radiograph was not conclusive. In 18 cases, laparotomy was performed within 48-hour post diagnosis, the others were postponed for preoperative cardiac evaluation, or infections secondary to aspiration pneumonia.

Laparotomy confirmed the type of the obstruction, atresia with a duodenal gap was the most common cause in 11, annular pancreas in 8, and cordonal atresia in 2 cases. None had the classic apple-peel syndrome. In 18, the short-term postoperative course was uneventful, oral feeding started on the fourth day, including one patient referred with 2 days history of drained anastomotic leak that occurred on the second day of his duodeno-duodenal anastomosis. Leak was confirmed by ultrasound for abdominal distension, showing the presence of significant intra-abdominal fluid. This patient recovered with the normal delay from immediate re-exploration, resection of the duodenojejunal loop and, duodeno jejunal latero-terminal anastomosis with TNJT and protective gastrostomy. In 3 cases, the TNJT fell down at 48 hours, 4 days and 9 days post op, the first was discharged against medical advice on day 12 before tolerating oral feeding, the others had an initial resurgence in the symptoms of duodenal obstruction, to be resolved later, on day 16 in the second patient and day 13 in the third patient, TNJT in place was removed 4 days later. We report that one mortality occurred after cardiac surgery was carried out at the age of 23 days: case of great vessels transposition, duodenal atresia and, cloacae malformation. His duodenal atresia repair carried out at the age of 3 days was uneventful. Long term follow up was uneventful, except in one patient who had an episode of adhesive intestinal obstruction treated conservatively, and another 2-year-old girl still under regular follow up for single gallstone of 10 mm diameters, diagnosed at the age of 3 months.

Failure of canalization of the duodenum between the eighth and tenth gestational week can lead to its atresia or stenosis. On the contrary, there are 2 major hypotheses concerning the development of annular pancreas, adhesion of the right ventral anlage to the duodenal wall (Lecco's theory), and persistence of the left ventral anlage (Baldwin's theory).² Atresia or complete obstruction may be

seen with duodenal muscular continuity -cord type- or with a gap usually filled in with pancreatic tissue. An intact membrane in the shape of a "wind-sock" web is a well-known anomaly and is almost always intimately involved with the entry of bile ducts, which call for extra vigilance during the operation. The overall incidence of intestinal atresia was estimated worldwide to be one per 2500 live births, making this anomaly approximately twice as common as esophageal atresia or congenital diaphragmatic hernia and almost 3 times more common than Hirschsprung disease. It seems to be more frequent in our region by the high percentage rate of consanguinity. The sex distribution is almost equal, and familial occurrence is rare and complex (for example: Feingold syndrome, an autosomal dominant condition, including tracheo-esophageal atresia, microcephaly, hand and foot anomalies, fascial dysmorphism, and developmental delay).⁶ Associated anomalies are frequent and variable.⁷ Polyhydramnios is very high in 30-78% of cases, prematurity is noted in more than one third of cases, and almost 50% are associated with other congenital abnormalities represented by cardiac anomalies which could dictate the final outcome more than the urinary tract, digestive or musculo-skeletal anomalies. Up to 40% have trisomy 21. The distal biliary tree anomalies are common, in 85% of cases it opens in the proximal duodenal segment. Association with chyloascites has not been reported previously. The prenatal diagnosis is frequently performed by the prenatal ultrasound showing the dilated stomach and proximal duodenum; after the 25th gestational week, the discovery of polyhydramnios should incite the research of an upper intestinal obstruction. Post-natal diagnosis should not be delayed until the occurrence of pulmonary complications. Bile stained gastric fluid, feeding intolerance or recurrence of clear or bile stained vomiting starting within hours of birth require an abdominal radiograph to confirm the diagnosis by the classic finding of double bubble.

Table 1 - Presentation pictures.

Birth weight	Gender	Type of anomaly	Dilated stomach on prenatal ultrasound	Polyhydramnios
1000g	1 male	Atresia. 1 with Down's syndrome	Negative	0
1550 - 2500g	4 male 5 female	Atresia- 5 Annular pancreas - 4 Down's syndrome - 4	3 of 8 were negative	3: 2 noticed by ultrasound
More than 2500g	6 Male 5 Female	Atresia - 7, Annular pancreas 4; 2 with simple stenosis and 2 with Down's syndrome	2 of 10 were negative	7: 5 noticed by ultrasound

The presence of intestinal gas beyond the duodenum indicates incomplete obstruction, in this case a mid gut volvulus cannot be excluded and even in absence of its evidence, urgent exploration is recommended as soon as the patient is stable. Intestinal perforations are very rare complications. In cases of feeding difficulty or recurrent vomiting with unclear double bubble shape on the abdominal radiograph, other radiological modalities play an important role in the work up of more than direct diagnosis. Some cases of an incomplete obstruction are not recognized until adult life, usually diagnosed during the work up of peptic ulcer.⁴ A thorough clinical examination to rule out other congenital anomalies, resuscitation, and gastric decompression, should precede the systematic and methodic surgical exploration. The type of the anomaly could orient on the etiology of congenital duodenal obstruction: malrotation, anterior portal vein. Associated biliary and intestinal anomalies must be considered before abdominal closure. We do not dissect the biliary tract unless an evident anomaly is seen. Simple malrotation without atresia is treated by the Ladd procedure, and the simple web or short stenosis needs plasty or resection, for all other cases we performed a trans mesocolic duodenojejunal anastomosis stented by a trans anastomotic feeding tube size 6 Fr for 2 weeks. This method provided full satisfaction due to its simplicity, early oral feeding tolerance as early as 4 days post op and early discharge with a small feeding tube shortened to the paranasal area and fixed by a simple adhesive tape. Whatever the surgical technique, the slow anastomotic function is a common problem in duodenojejunal anastomosis, which is not always feasible and may require more extensive dissection to approximate the duodenal ends.⁵ Duodenal tapering runs a higher risk of fistula and injury to the ampulla of Vater.⁸ Currently, the laparoscopic approach is recommended,⁹ yet whatever the surgical technique employed, trans anastomotic stent provides early oral feeding without adjunct complication. There were no complications related to the stent in our series. Endoscopic excision is reserved for partial web, fiber optic endoscopy identifies the obstruction and endoscopic retrograde cholangio-pancreatography has been able to document the abnormalities of the bile and pancreatic ducts system. Post operative complication had been reported in 70%, with 18% surgical redo surgery, anastomotic leak, and delay in feeding tolerance from 6-45 days. Long-term complication includes alkaline reflux and peptic ulceration, duodenal stasis with blind loop syndrome, recurrent abdominal pain or diarrhea. Gallstone has been also reported following duodenal atresia repair. Generally, the survival in infants with duodenal anomalies is more than 95%. Mortalities are the result of severe cardiac anomalies. Growth

retardation and development delay are also very rare out of major associated anomalies.

In conclusion, congenital duodenal obstruction is a frequent anomaly; total parenteral nutrition as well as the great progress in the neonatal intensive care improved the outcome greatly. Trans mesocolic duodeno-jejunal anastomosis with TNJT provides early oral feeding and has no inherent specific complications.

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The prevalence of *Candida dubliniensis* among germ tube positive candida samples isolated from the respiratory tract

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C*andida dubliniensis* (*C.dubliniensis*) is one of the germ tube and chlamydospore forming *Candida* species, which was first recognized in 1995. It is difficult to differentiate from *Candida albicans* (*C.albicans*) with the standard diagnostic laboratory methods due to their similar phenotypic characteristics. However, *C.dubliniensis* can be

differentiated from *C.albicans* by means of characteristics such as lack of intracellular β -glucosidase activity, inability to proliferate at 42°C and 45°C, formation of typical chlamydospore on cornmeal Tween 80 agar, typical colony and chlamydospore appearance on Staib agar, the formation of dark green colonies on CHROM agar medium at first isolation, XYL (D-xylose) and MDG (a-methyl-D-glucoside) negative appearance at the commercially available fungus identification kits, such as the API 20C AUX and API ID 32C systems, but, nevertheless, identification of the genotypic characteristics by molecular modalities is necessary for a certain diagnosis. The yeast has a widespread geographic location. Although it has been isolated from sputum, blood, vaginal flora, lungs, and feces the vast majority of *C.dubliniensis* isolates obtained to date, have been identified primarily from the oral cavities of individuals infected with human immunodeficiency virus (HIV) and, therefore, were believed to have a particular relation with HIV infection. However, increased number of recent publications reporting *C.dubliniensis* isolation from HIV-negative individuals suggested a need for extensive research on the epidemiology of this yeast. In vitro fluconazole resistance of the *C.dubliniensis* isolates, however, enhance the importance of the isolation of this yeast. In our study, we examined 60 germ tube positive isolates that had been determined as a causative of infection among HIV negative patients hospitalized in various clinics due to respiratory tract infections.

Between June 2003 and May 2004, 60 germ tube positive isolates which were isolated from the respiratory tract samples of patients from various clinics and sent to Ankara University Medical School, Department Of Clinical Bacteriology and Infection Diseases Laboratory, and accepted to be the causative infectious agent, were studied to determine the existence of *C.dubliniensis* at the Department of Microbiology and Clinical Microbiology, Ankara University Medical School. National Institute of Health A strain and *C.albicans* 26555 and *C.dubliniensis* 36 for *C.dubliniensis* were used as controls in the phenotypic and genotypic methods. Samples preserved at -20°C were subcultured by incubating for at least 48 hours under aerobic conditions on Sabouraud Dextrose Agar (SDA, Merck). Among Candida isolates, phenotypic characteristics of *C.dubliniensis* were investigated by analysis of germ tube formation in human serum at 37°C for 3 hours. The degree of chlamydospore production on cornmeal agar supplemented with 1% Tween 80, growth at 45°C on Sabouraud dextrose agar (SDA), colony morphology on Staib agar was recorded. Polymerase chain reaction (PCR) with primers

specific for each species was used for the diagnosis of *C.albicans* and definitive differentiation from *C.dubliniensis*.

Germ tube and chlamydospore formation. All isolates were incubated in human serum for 3 hours at 37°C and evaluated for germ tube formation. To determine chlamydospore formation, all isolates were cultured on Tween 80 medium with cornmeal agar and incubated at room temperature and were evaluated on the second, fifth and tenth days of incubation.

Growth at 45°C. The growth features at 45°C were examined on SDA plates by incubating for 72 hours. To minimize the possible effects that may arise from temperature variations, plates were preheated at 45°C for 30 minutes before subculture.

Subculture on Staib agar. All isolates were streaked on Staib agar (Guizotia abyssinica 50g, glucose 1g [Merck], KH_2PO_4 1g [Merck], agar 15g) to evaluate their colony morphology. Subcultures were incubated at 30°C for 48 hours, then at least 10 colonies for each isolate were evaluated visually and with colony microscope (Leica MZ6).

DNA extraction. The DNA for PCR was extracted by minor modifications of the protocol of Dassanayake et al.²

PCR identification. For the definite identification of *C.albicans* and *C.dubliniensis*, primers specific to *C.albicans* (NL4 and CAL5) and *C.dubliniensis* (DUBF and DUBR) and defined reaction conditions were used.^{3,4}

All the isolated 60 Candida species were reevaluated for germ tube formation and all of them produced germ tube. All isolates produced chlamydospore on cornmeal agar as from the second day. Germ tube and chlamydospore forming 60 isolates were subcultured on SDA and incubated at 45°C for 72 hours. At the end of the incubation, only 2 isolates failed to grow at 45°C. Germ tube and chlamydospore forming 58 isolates and the 2 isolates likely to be *C.dubliniensis* were subcultured on Staib agar and incubated at 30°C for 48 hours to obtain their colony morphology. After the incubation, isolates were evaluated both visually and with colony microscope. All samples produced smooth colony on Staib agar. A PCR was applied to all 60 isolates for the definite diagnosis. All the isolates were identified as *C.albicans*, however, there were no *C.dubliniensis*.

Candidae are normally regarded as commensal organisms, but when certain pathological processes alter the balance between the host and the endogenous flora, they become opportunistic endogenous pathogens with the capacity to produce superficial and deep-seated infections. *Candida albicans* is by far the most frequent agent responsible for fungal infections; however, the emergence of non-*C.albicans* species, such as

Candida parapsilosis, *Candida krusei* and *Candida tropicalis*, has also been observed. The recent emergence of *C.dubliniensis* as an opportunistic pathogen appears to coincide with this apparent epidemiological shift.⁵ Although the majority of the *C.dubliniensis* isolates have been recovered from the oral cavities of HIV-infected patients, this fungal organism has also been isolated from specimens from different body sites.⁶ In our study, our aim was to determine the prevalence of *C.dubliniensis* among patients with respiratory tract infections but without HIV-infection or AIDS, so, patients hospitalized in various clinics due to respiratory tract infections composed the study group and we examined the 60 germ tube positive isolates that were isolated as the infectious factor from the sputum samples of these patients.

There are few studies in the literature reporting the *C.dubliniensis* rate in the respiratory tract samples of HIV-negative patients. Fotedar et al⁷ reported 7 *C.dubliniensis* in their study on 75 germ tube positive respiratory samples of sputum, bronchoalveolar aspirate, and nasopharyngeal aspirate by using the phenotypic methods. In a study of Kantarcioğlu et al⁸ among an immunocompromised HIV-negative Turkish patient population, *C.dubliniensis* was isolated in the oral cavity and sputum of a patient with acute myeloid leukemia at 2 month intervals. Petroche-Liacsahuanga et al⁹ reported the 11.1% (6/54) rate of *C.dubliniensis* in the sputum samples of 54 patients with cystic fibrosis. In our study, we did not encounter *C.dubliniensis* among the 60 germ tube positive *Candida* species isolated from the sputum samples by using phenotypic and genotypic methods, however, more frequent recognition in the cystic fibrosis patient population and ability of producing fluconazole resistance features of the yeast necessitates extensive studies in particular patient populations and their samples in different geographic locates.

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Noninvasive ventilation in mild to moderate cases of respiratory failure due to acute exacerbation of chronic obstructive pulmonary disease

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Exacerbations of respiratory symptoms requiring medical intervention are important clinical events in chronic obstructive pulmonary disease (COPD), and are the major causes of morbidity and mortality. A severe exacerbation may lead to worsening of the clinical status, blood gas parameters and inspiratory muscle dysfunction which may lead to acute respiratory failure. A major clinical problem in acute on chronic hypercapnic respiratory failure is the inability to adequately oxygenate without worsening the hypercapnia, and therefore incurring the need to support ventilation. Over the last 15 years, noninvasive positive pressure ventilation has been used in this group of patients with variable success rates. Most studies compared

the efficacy of noninvasive ventilation in averting endotracheal intubation in patients with severe acute hypercapnic respiratory failure due to acute exacerbation of COPD (AECOPD) who were likely to need invasive mechanical ventilation from the time of inclusion into the study. The present study was conducted in patients with COPD exacerbation complicated by respiratory failure of a mild to moderate degree; none of the patients required endotracheal intubation at the time of inclusion. We compared standard therapy with standard therapy plus noninvasive ventilation as first line intervention in patients with acute or chronic respiratory failure due to COPD not requiring invasive mechanical ventilatory support and stable enough to be admitted to the general respiratory ward.

Patients who presented to the outpatients or emergency departments of the institute with signs and symptoms suggestive of acute exacerbation of COPD were evaluated. Patients were admitted to the study if they fulfilled the following criteria: pulmonary function tests suggesting COPD, chest radiograph showing no evidence of an acute infection or any other pulmonary disease and compatible with the diagnosis of COPD and presence of any of the following: pH more than 7.25, partial pressure of carbon dioxide in arterial blood (PaCO₂) more than 45 mm Hg on room air. Patients were not admitted to the study if they had any of the following: respiratory rate more than 35/min, pH less than 7.25, PaCO₂ more than 70 mm Hg, need for urgent endotracheal intubation,

medically unstable (hypotensive shock, uncontrolled cardiac ischaemia or arrhythmia), unable to protect airways, excessive secretions, agitated or uncooperative, pulmonary tuberculosis (past or present), history of recent myocardial infarction or abdominal surgery and any other respiratory disorder. Patients were randomly assigned to receive standard therapy or standard therapy plus Bilevel Positive Airway Pressure ventilation (BiPAP) using the random number table.

Standard therapy included controlled oxygen with fixed percentage masks (or nasal cannulae if masks could not be tolerated) to maintain a target oxygen saturation of 85-92%, nebulized salbutamol (2.5 mg every 4 hours) and nebulized ipratropium bromide (250 µg every 6 hours), oral prednisolone 30-40 mg every day for a minimum of 5 days; antibiotics, aminophylline and diuretics were used at the discretion of attending medical staff. Noninvasive positive pressure ventilation (NIPPV) was delivered via portable ventilator (ResMed Sullivan VPAP II ST) via face mask or nasal mask for 6 hours in a day, in 2 sittings of 3 hours each, for 3 days. The standard therapy as discussed above was also given to patients in addition to NIPPV. Patients in both the groups were admitted to the hospital for a minimum period of 3 days.

Each patient was evaluated for level of cooperation, mental status, pulse rate, respiratory rate, blood pressure, arterial blood gases breathing room air and shortness of breath using Borg scale at the time of inclusion into the study. Follow up

Table 1 - Physiological measurements at different time points in the study

Parameters	Baseline	1 hr.	3/4 hrs.	6 hrs.	12 hrs.	24 hrs	48 hrs.	72 hrs.	F ratio
PR (per min)									
ST	98.46 ± 11.26	99.85 ± 11.85	99.31 ± 14.07	94.77 ± 11.03	93.38 ± 11.24	92.30 ± 1.94	94.31 ± 11.86	92.00 ± 9.02	2.08
BiPAP	106.92 ± 12.40	103.54 ± 11.40	100.62 ± 10.21	99.69 ± 10.73	97.23 ± 6.81	100.15 ± 13.87	92.46 ± 11.14*	91.08 ± 11.91*	5.186†
RR (per min)									
ST	28.85 ± 4.32	28.15 ± 4.65	27.54 ± 5.72	25.77 ± 4.04	25.23 ± 4.66	23.69 ± 3.35*	24.00 ± 6.15*	21.69 ± 4.68*	6.564†
BiPAP	30.61 ± 4.19	26.77 ± 4.13*	25.38 ± 4.43*	25.54 ± 4.01*	25.08 ± 4.94*	26.31 ± 6.16*	25.08 ± 5.87*	23.54 ± 4.18*	6.538†
BS									
ST	5.67 ± 1.40	4.46 ± 1.05*	3.69 ± 0.95*	3.08 ± 0.86*	2.85 ± 0.80*	2.38 ± 0.65*	2.08 ± 0.95*	2.00 ± 1.08*	43.59†
BiPAP	6.46 ± 1.85	4.85 ± 1.46*	4.30 ± 1.25*	3.62 ± 1.56*	3.38 ± 1.45*	3.92 ± 1.75*	3.23 ± 1.69*	2.46 ± 1.05*	19.81†
pH									
ST	7.38 ± 0.06	7.40 ± 0.05	7.40 ± 0.05	-	-	7.38 ± 0.06	7.40 ± 0.05	7.40 ± 0.05	1.526
BiPAP	7.37 ± 0.06	7.39 ± 0.07	7.38 ± 0.07	-	-	7.37 ± 0.06	7.39 ± 0.07	7.38 ± 0.07	3.617**
PaO₂(mmHg)									
ST	50.61 ± 9.75	55.69 ± 11.88	53.38 ± 10.57	-	-	54.15 ± 13.33	58.46 ± 10.52	58.00 ± 15.76	2.578†
BiPAP	44.31 ± 6.43	46.23 ± 6.41	48.69 ± 8.54	-	-	45.08 ± 11.13	50.62 ± 8.53	56.08 ± 10.62*	8.48†
PaCO₂(mmHg)									
ST	58.17 ± 5.58	57.25 ± 9.32	55.68 ± 9.76	-	-	55.84 ± 11.09	55.53 ± 9.83	53.46 ± 7.70	1.409
BiPAP	62.59 ± 5.17	61.95 ± 7.82	61.44 ± 7.79	-	-	63.99 ± 10.94	60.28 ± 7.21	58.75 ± 8.49	2.092

* - $P < 0.001$ when compared to baseline values, † - $P = 0.035$ by repeated measures ANOVA, ** - $P = 0.006$ by repeated measures ANOVA, ‡ - $P < 0.0001$ by repeated measures ANOVA, PR - pulse rate, RR - respiratory rate, BS - Borg scale, ST - standard therapy, hr - hour, BiPAP - Bilevel positive airway pressure

measurements of these parameters were carried out at one hour, 3 hours, 6 hours, 12 hours, 24 hours, 48 and 72 hours after admission to the study. Arterial blood gas analysis with the patients breathing room air was repeated at one hour, 4 hours, 24 hours, 48 hours and 72 hours after inclusion. After enrollment and randomization, patients were taken out of the study and intubation was performed if any of the following was present: respiratory arrest, respiratory pauses with loss of consciousness or gasping for air, psychomotor agitation making nursing care impossible and requiring sedation, heart rate below 50/min with loss of alertness and hemodynamic instability defined as systolic blood pressure of less than 70 mm Hg. The analysis of the effects of treatment in both the groups on the variables measured sequentially throughout hospitalization was made using repeated measures analysis of variance (ANOVA) followed by a post hoc contrast analysis, namely, multiple comparison test (Bonferroni test). Differences in the mortality and intubation rates between the 2 groups were compared using Fisher's exact test. A *p*-value lower than 0.05 was considered significant. The statistical analyses were carried out by using the Statistical Package for Social Sciences.

Twenty-nine patients were included in the study; 14 patients were randomly allocated to the BiPAP group and 15 to the standard therapy (ST) group. Three patients met the exit criteria of the study. One patient in the BiPAP group was not able to tolerate the mask after a few hours; one patient in the ST group died 2 days after inclusion into the study and one patient in the ST group required invasive mechanical ventilation 6 hours after inclusion.

At the time of admission, mean pH of patients in the ST group was 7.38 ± 0.06 and in the BiPAP group it was 7.37 ± 0.06 ($p>0.05$). Twelve patients in the ST group and 9 patients in BiPAP group had a pH more than 7.35 at the time of admission ($p>0.05$). Patients in the BiPAP group had a mean PaO₂ of 44.31 ± 6.43 mm Hg at the time of admission against 50.61 ± 9.75 mm Hg in the ST group ($p>0.05$). The mean PaCO₂ at admission of patients in the BiPAP group was 62.59 ± 5.17 mm Hg and that in the ST group was 58.17 ± 5.58 mm Hg ($p=0.05$). None of the patients in BiPAP group required invasive mechanical ventilation while one patient in ST group (pH at admission: 7.35) was given invasive mechanical ventilation 6 hours after inclusion into the study for deteriorating orientation levels and respiratory pauses.

Patients' heart rate improved in the BiPAP group, and a significant difference ($p<0.0001$) was noted 48 hours after initiation of therapy, while the difference in ST group was not significant when heart rate at various time points after admission was

compared. It took 24 hours in the ST group to have a significant drop in respiratory rate, whereas in the BiPAP group, improvement was seen within one hour and persisted until the end of the study ($p<0.0001$ for both the groups). Patients in both the groups reported a significant improvement in breathlessness as assessed by Borg scale within one hour of therapy. There was a significant improvement in pH in the BiPAP group ($p=0.006$) after 72 hours of therapy. The pH increased from 7.37 ± 0.06 at the time of admission to 7.41 ± 0.04 at 72 hours. The improvement in pH in the ST group was not significant ($p=0.2$). The mean partial arterial oxygen tension (PaO₂) in the BiPAP group went up from 44.31 ± 6.43 mm Hg to 56.08 ± 10.62 mm Hg at the end of 72 hours ($p<0.0001$). The PaO₂ also improved in the ST group from 50.61 ± 9.75 mm Hg at admission to 58.00 ± 15.76 mm Hg after 72 hours ($p=0.035$). Although both the groups showed a trend towards improvement in partial pressure of carbon dioxide, the improvement was not significant in either of the groups (Table I). The mean duration of stay in the hospital was 10.20 ± 5.64 days in the ST group while it was 9.77 ± 3.32 days in the BiPAP group. The difference between the 2 groups was not statistically significant ($p>0.05$).

Brochard et al¹ reported that there was a significant improvement in the encephalopathy score, respiratory rate, PaO₂, and pH during the first hour of treatment in the noninvasive ventilation group, whereas there was significant deterioration in the ST group. A dramatic improvement in pH and PaCO₂ within one hour was also observed by Bott.² Popenick et al³ concluded that a 30 minute trial can predict success with BiPAP as shown by an improvement in pH, PaCO₂ and overall clinical appearance. Our results (changes in pH, PaCO₂ and respiratory rate) are similar to those observed by Plant et al.⁴ wherein we also noticed a fall in respiratory rate and improvement in pH with a nonsignificant fall in PaCO₂.

None of the patients in our study was a candidate for invasive mechanical ventilation at the time of inclusion to the study. All the patients were able to maintain a satisfactory level of saturation of oxygen with supplemental oxygen delivered via nasal prongs or fixed percentage masks. These are the patients that would normally be treated with standard therapy. But, these patients are at a risk of developing dangerous levels of hypercapnia with supplemental oxygen therapy and may require ventilatory support.

Based on our findings, it is suggested that both standard therapy and standard therapy plus BiPAP are effective in treating patients with mild to moderate forms of acute on chronic respiratory failure due to acute exacerbation of COPD and avoiding endotracheal intubation. Bilevel Positive

Airway Pressure ventilation therapy can be easily administered in the general respiratory ward setting. Since 80% of our study subjects in ST group, and 64% in BiPAP group had a pH of more than 7.35, noninvasive ventilation can be a useful adjunct to standard therapy for early recovery from acute episodes in this group of patients as well.

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Stressors and coping strategies of medical students. Gender differences

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Medical education is known to be a stressful process. Students are faced with demanding academic standards, deadlines, career aspirations, and the need to compete for residency positions.¹ The sources of stressors in medical students can be grouped into 3 general categories. Academic stressors include the condensed curriculum, exam conditions, peer competition, interactions with senior staff on ward rounds, and fear of incompetence. Social and personal stressors are caused by lack of free time for recreation, family, and intimate friends. Financial stressors derive from the need for continued financial dependence on family. Coping strategies and stress management have been studied. Some are considered "maladaptive" or harmful to health such as alcohol/drug abuse, smoking, binge eating, and

interpersonal withdrawal. Whereas others are "adaptive" and conduct to better physical and psychosocial health, for example, exercising, seeking external social support, relaxing, or organizing work time better.² Gender differences in anxiety levels is well known. There is a consistent finding that female medical students score higher on "general anxiety", "test anxiety" and "neuroticism" scales than their male counterparts. Multiplicity of demands, the relative lack of women role models in academic medical centers and more difficulty in resolving issues of intimacy and career have been reported as contributing factors.³ The purpose of the present study is to investigate stressors in male and female Kuwaiti medical students and compare differences in the coping strategies they employ when confronted by a variety of stressors.

This cross-sectional survey is part of a study among medical students in 3 countries in the Middle East [conducted and supervised by the World Health Organization (WHO-EMRO) and the International Federation of Medical Students' Associations (IFMSA)]. All the 443 students who attended the medical school on a permanent basis during the academic year 2002-2003 represented the target population. Those who returned completed questionnaires were 333, with a response rate of 75.2%. The target population anonymously completed a self-administered and structured questionnaire. Sociodemographic data were covered. Twelve stressors that usually face the medical students were involved; each assessed by a 3 point Likert scoring system. The reliability coefficient analysis revealed high internal consistency between the different stressors ($\alpha = 0.8$). The total stressor scale was used to divide participants into 2 groups. A "low-stress" group with the total stressor scale the median, and a "high-stress" group with total stressor scale > than the median. Another set of questions referred to 7 different coping strategies reported by the students.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 12. Chi square test (χ^2), odds ratio, Student-t test, and ANOVA were used. Factor analysis using Principal Component Analysis (PCA) and the Varimax rotation method was performed to the 12 stressors. Reliability Coefficient was performed to estimate the internal consistency between the studied stressors. The level of significance was $p < 0.05$ and confidence interval (CI) = 95%.

The mean age and standard deviation of the students were 21.5 ± 1.95 and the median was 21. More than one half of the sample was females (58.2%). Approximately half of the students considered their background as religious (48.9%) or moderately religious (43.1%) with the majority being females (65% and 55.3%). Gender difference was statistically significant ($\chi^2=11.801, p=0.008$).

The majority of the students lived with their parents (88.5%) and only 0.6% lived alone. The total stressor scores ranged from 12-34 with a mean and standard deviation of 19.9 ± 4.5 ; the median was 20. There was no significant association between the total stressor scores and any of the sociodemographic features of the sample. Over 75% of the students were sometimes or always worried about the future. Likewise, over 67% were sometimes or always worried about family expectations. Only 12% of the students reported that they were always worried about their personal emotional problems. Females scored significantly higher than males ($p < 0.05$) with respect to all 3

types of stressors. Alternatively, the study revealed that among those who always had worries about political and national problems (10.5%), and public interest (7.2%), males rated significantly higher than females (52.9% versus 47.1%, $p < 0.05$) for former stressor and 73.9% versus 26.1%, $p < 0.005$ for the latter one. No significant gender differences in the other types of stressors were found. Dividing the students into high and low stress levels; the students were almost divided equally in the 2 groups (49.8% and 50.2%). Female students scored higher than male students on both stress levels (56% and 60.4%) but with no significant difference. As shown in **Table 1**, the PCA with Varimax rotation of the 12 stressors generated 3 factors with Eigen values greater than unity. The 3 components explained approximately 55% of the total variances. The first factor is related to "public and national stressors".

The second component represented "personal stressors". The third component related to "future stressors". **Table 2** shows that eating when stressed was the most common coping strategy employed by more than 75% of the students with no significant gender differences. Driving at high speed when worried was the second most commonly used coping strategy reported by 61%. Females endorsed this strategy more often than males ($p = 0.05$). Approximately 14% smoked to cope with their stressors. This strategy was more common in males than in females ($p < 0.0001$). Although drinking alcohol received the lowest number of endorsements, there was a significant sex difference since male users were more than double female users ($p = 0.02$). The study revealed that younger students used some coping strategies more than older students; the difference was statistically significant for eating strategy ($F = 2.7$, $p < 0.05$), using prescription drugs ($F = 4.2$, $p = 0.007$), and drinking alcohol ($F = 3.6$, $p = 0.01$). Approximately 60% of the students who often drove at high speed or smoked

Table 1 - Factor analysis using principal component analysis of the different types of stressors reported by the Kuwaiti medical students.

Original stressors	Component matrix coefficients		
	I	II	III
1. About the future	-	-	0.82*
2. Family expectations	-	-	0.68*
3. Health problems	0.29	0.35	0.39
4. Academic worries	-	0.25	0.67*
5. Family problems	0.11	0.75*	0.18
6. Personal emotional problems	-	0.64*	0.23
7. Personal financial problems	0.19	0.74*	-
8. Social connections	0.48*	0.56*	0.2
9. Political and National worries	0.79*	-	0.14
10. Public interest	0.82*	0.19	-
11. Religious expectations	0.7*	0.25	0.1
12. Aspects of everyday life	0.44	0.34	-
Total variances (%)	19.9	18.8	15.8
Rotation method: Varimax with Kaiser Normalization * - Loadings equal to almost 0.5 or more			

Table 2 - Number and percentage of utilization of different coping strategies by the Kuwaiti medical students.

Coping Strategies	Not used			Used			P-value
	Male (%) ^a	Female (%) ^a	Total N (%) [†]	Male (%) ^a	Female (%) ^a	Total N (%) [†]	
1. Eating	45.2	54.8	87 (26.1)	40.7	59.3	246 (73.9)	0.275
2. Using illicit drugs	40.9	59.1	311 (93.4)	55	45	22 (6.6)	0.158
3. Using on the counter drugs	42.1	57.9	249 (74.8)	40.7	59.3	84 (25.2)	0.467
4. Using prescription drugs	43.1	56.9	198 (59.5)	39.4	60.6	135 (40.5)	0.292
5. Smoking	35.8	64.2	285 (85.6)	8.8	18.2	48 (14.4)	0.000
6. Driving at high speed	35.9	64.1	130 (39)	45.5	54.5	203 (61)	0.05
7. Use of alcohol	40.1	59.9	312 (93.7)	68.4	31.6	21 (6.3)	0.015
^a Percentage from the total number of this group [†] Percentage from the total sample (N=333)							

when worried described their religious background as "a little bit" religious compared to only approximately 5% and none who described themselves as "very" religious; ($\chi^2=24.1$, $p=0.004$ and $\chi^2=18.2$, $p=0.03$). The results revealed that students who reported high stress levels were more than twice as likely to use illicit drugs to cope with their stressors (OR=2.5, CI: 1.01 – 6.6, $p=0.05$) than those with low stress levels. The former group of students were also at higher risk to use over the counter drugs (OR=1.8, CI: 1.06-2.95, $p=0.02$) and drive at high speed (OR=1.7, CI: 1.08-2.65, $p=0.01$) as different methods to deal with their stressors than their school peers with low stress levels. However, the other reported coping strategies were not considered as correlates of the effect of stressors.

The results revealed that male and female medical students differ in response to various stressors and in terms of the coping strategies they employ. Female medical students were more worried about personal issues related to their future, family expectations and emotional problems than males. Similar stressors were found associated with anxiety among females in general and medical students in particular in other studies.^{4,5} In contrast, males worried more about public and national domains than females. This might be due to societal pressure in the Kuwait community that enhances male medical students despite having a career as future doctors, to aspire to being leaders and having political positions. "Public and national stressors" was the most important stressor although not related to the medical nature of study, adds a different interest of the medical students in Kuwait. Many studies tried to relate gender difference in response to stressful situations to genetic origin. Some studies suggested that an inherited difference in catecholamine metabolism is important in the pathogenesis of anxiety sensitivity in women.⁶ Also, the female socialization process should not be ignored as crucial factor in raising their stressor exposure. Male students were found to smoke and drink alcohol more than females. This is an expected finding due to more accessibility of these substances to males that help them to practice such diverse health behaviors especially during this age of adolescence. Moreover, the conservative cultural customs in Kuwait prevent females from practicing these habits, as they are socially unacceptable. This is concordant with the finding that maladaptive or unhealthy coping behaviors were more clearly demonstrated in men compared to women particularly with respect to excessive consumption behavior as cigarette smoking and alcohol.⁷ Religion was another finding that affects the better way of using coping styles. This finding is in agreement with the study that established that dependent on the amount of stress, religious orientation influences the

use of coping strategies.⁷ Young age was an important determinant for using some harmful coping strategies. This may reflect their immaturity and the spirit of adventure and curiosity that exists in the young. This finding is concordant with the study that found that adolescents and younger adults used strategies that were outwardly aggressive indicating a lower level of impulse control and self-awareness.⁸ This emphasizes the vital and crucial need for education and guidance of these young people to increase their awareness of the dangerous effects of harmful coping strategies.

Nevertheless, we presume that the findings of this study should be of worth to those involved in the education of medical students. Consideration should be given to program developers and health policy planners to focus on significant actions to reduce the academic stress experienced by the medical students. Psychological consultations have to be available in each medical school trying to help the students to face their individual stressors in a healthy way.

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Smoking habits among Pharmacy students at a University in central Saudi Arabia

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The most important determinant of human health trends is the increase in smoking related morbidity and mortality. Tobacco related deaths are expected to increase to 10 million within the next 20-30 years, of which 70% will occur in the developing countries. This will project smoking as the largest single health problem now.¹ For instance, there are 80-90% of deaths from chronic obstructive pulmonary disease attributed to tobacco, and smokers have 6 times the risk to acquire this disease compared with non-smokers. Many university colleges conducted several studies among their student populations to determine the smoking rates of medical students and their knowledge of smoking related diseases and intervention strategies.² Overall, smoking was found to be less prevalent among Asian students than in Europeans. Although, the issue of tobacco related to smoking-attributed disease and smoking cessation technique was included in the curriculum of many medical schools worldwide,³ pharmacy schools are still dragging behind in this respect, where tobacco issues are unsystematically and sporadically integrated with other teaching. Therefore, this study was conducted to examine the prevalence, pattern of smoking, attitudes towards public measures against smoking and teaching the tobacco issues in Pharmacy College. The appraisal of the role of the pharmacist in smoking cessation was also investigated.

The study was conducted in 2004. A 7-page modified anonymous self-administered questionnaire was developed from World Health Organization (WHO) standard questionnaire in English with translation provided in Arabic and then administered to the sample of 400 students randomly selected from different educational levels. Before full implementation, the questionnaire was piloted in a 10% sample. Based on the preliminary results generated through the pilot study, the questionnaire was modified and finalized. In addition, the questionnaire was subjected to a manual validity check. The reliability was assessed using Cronbach's coefficient alpha index for randomly selected variables. The 4-part questionnaire consisted of 38 questions of varied format, including checklists, open- and closed-ended questions. Data were analyzed using the Statistical Package for Social Science (SPSS) version 10.0 for Windows (SPSS Inc., Chicago, Illinois). The analysis included frequency of discrete variables and codescriptives. The rate was 88% with 400 questionnaires distributed and 352 returned. The mean age of respondents was 21.8 years. When the

sociodemographic variables (age and educational level) of smokers were compared with non-smokers, it was observed that the significant numbers of the smokers were above the age of 22 years and they were in final education levels. Regarding prevalence of smoking and influencing factors and reasons for smoking and non-smoking the results of the study showed that 47 of the students (13.4%) were current smokers, while 15 students (4.3%) were ex-smokers. Two hundred and ninety students (82.4%) claimed that they never smoked. Among students who smoke, only 2 students smoked sheesha (the traditional Arabic smoking pipe) along with cigarettes. According to the distribution of current smokers, most students (91%) are daily smokers, and smoked their cigarettes at any time of the day and night. The minimum age of starting cigarette smoking was 10 years or less. The mean age for starting smoking was 17 years. On average, most of the smokers smoked 20 cigarettes per day. In addition, 38.3% of smokers smoked light cigarettes, and only 23% of the students smoked filter-tipped cigarettes, while 14.9% smoked plain, and 12.8% smoked mild cigarettes. Approximately 40% of the smokers smoked their first cigarette at any time of the day and night, while 38.3% smoked immediately when awaking up in the morning, and only 21.3% within half an hour after waking.

Regarding the favorite places of smoking, 37 students (78.7%) smoked anywhere, while 5 only (10.4%) generally smoked at home and the remainder smoked at the college. Thirty-five smokers (74.5%) indicated that smoking had adversely affected their health. Twenty-nine smokers (61.7%) had no difficulty in stopping smoking in places where it is forbidden. Among 47 smokers, 35 (74.5%) had unsuccessfully considered quitting smoking, whereas, 12 of the smokers (25.5%) had actually never tried to do so. Of those who failed to quit smoking, 33 (70.2%) were still determined to try quitting smoking again. Twenty-five smokers (71.4%) tried to quit by themselves, while 14.3% with the aid of the pharmacist's advice on the use of nicotine replacement therapy. Twenty-eight (80%) smokers reported that people around them influenced them to continue smoking, whereas 24 (68.6%) indicated that the reason was the lack of will power. Only 16 (45.7%) reported that feeling stress at study led them to continue smoking. Thirteen of the students (37.1%) cited withdrawal symptoms, 11 (31.4%) did not know how to quit smoking, and only 5 (14.3%) indicated family problems. Among those who attempted to quit smoking, 15 of the smokers (48.9%) tried to quit smoking one month before starting the survey, 10 (28.6%) before 6 months and the remainder equally before one year and more than 4 years.

As shown in **Table 1** many students believed that cigarette smoking has health risks, 91.5% (n=322).

Three hundred (85.2%) knew that cigarette smoking is a risk factor for lung cancer, followed by 269 (76.4%) and 240 (68.2) for heart disease and chronic obstructive pulmonary diseases. However, 66.5% were equally unaware of the association between smoking and development of gastrointestinal tract problems and addiction, only 36.9%, 20.2% and 12.5% knew of the association between neonatal mortality and cancer of the bladder and Parkinson's disease. Most students showed positive or strongly positive attitudes towards public measures against smoking, and they agreed that an action should be taken to fine those who violate smoking in public places. However, smokers showed less positive attitude than non-smokers did.

Many students (46%) thought that they are not adequately prepared with skills and knowledge to participate in smoking cessation activities, whereas, 29.6% thought that they are prepared to do so and only 24.3% uncertain about their adequacy. Most of the students (55.1%) claimed that they would advise the smoker to quit only if the smoker raised the subject, while 21.1% believed that they had sufficient knowledge to counsel the smokers about the risks facing them. However, 16.4% of the students thought that they will advise the smokers only if smoking is contraindicated with their diseases, whereas, only 14.5% were willing to assist, but knew less about smoking cessation technique. The minority of students indicated that, they would take no action because they thought that

Table 1 - Responses of students on risk of smoking, source of information about smoking hazards, their attitudes towards public measures against smoking for smokers, ex-smokers and non-smokers.

Variables	Total	Smoker's	Ex-smoker	Non-smokers
	n (%)	n (%)	n (%)	n (%)
Do you think smoking could cause life threatening diseases				
Yes	322 (91.5)	40 (12.4)	11 (3.4)	271 (84.2)
No	14 (4.0)	5 (35.7)	3 (21.4)	6 (42.6)
Uncertain	16 (4.5)	1 (0.6)	-----	15 (93.8)
Health risks facing smokers*				
Lung disease	300 (85.2)	30 (10)	8 (2.7)	262 (87.3)
Heart disease	269 (76.4)	27 (10)	9 (3)	243 (90.3)
Chronic obstructive pulmonary disease	240 (68.2)	31 (12.9)	5 (1.7)	204 (85)
Teeth staining	167 (47.4)	19 (11.4)	6 (2)	152 (91)
Other types of cancer	143 (40.6)	13 (9.1)	1 (0.3)	129 (90.2)
Affect fetus	130 (36.9)	10 (7.7)	4 (3.1)	116 (89.2)
Weak physical fitness	125 (35.5)	14 (11.2)	3 (0.2)	108 (86.4)
Gastrointestinal tract problems	118 (33.5)	16 (13.6)	3 (2.5)	99 (83.9)
Addiction	118 (33.5)	12 (10.2)	4 (3.4)	102 (86.4)
Bladder cancer	71 (20.2)	9 (12.7)	1 (1.4)	61 (85.9)
Parkinson's disease	44 (12.5)	6 (13.6)	-----	38 (86.4)
Source of information about smoking hazards*				
Media	219 (62.2)	29 (13.2)	8 (3.7)	182 (83.1)
College	199 (56.5)	18 (9.1)	2 (1)	179 (90)
School	174 (49.4)	18 (10.4)	3 (1.7)	153 (87.9)
Physician	90 (25.6)	31 (34.4)	5 (5.6)	54 (60)
Others	70 (19.9)	6 (8.6)	2 (2.9)	62 (88.6)
Ban on Smoking in public places				
Strongly agree	260 (73.9)	16 (6.2)	10 (3.9)	234 (90)
Agree	59 (16.8)	12 (20.3)	4 (6.8)	43 (72.9)
Uncertain	15 (4.3)	5 (33.3)	-----	10 (66.7)
Disagree	7 (2)	6 (85.7)	-----	1 (14.3)
Strongly disagree	11 (0.3)	8 (72.7)	1 (9.1)	2 (18.2)
Action to be taken against those violating smoke banning				
Strongly agree	169 (48)	5 (3)	7 (4.1)	157 (92.9)
Agree	85 (24.2)	8 (0.9)	3 (3.5)	74 (87.1)
Uncertain	45 (12.8)	6 (13.3)	1 (2.2)	38 (84.4)
Disagree	33 (9.4)	18 (54.6)	1 (3)	14 (42.4)
Strongly disagree	20 (5.7)	10 (50)	3 (15)	7 (35)
Do you think smoking are more socially acceptable				
Yes	73 (20.7)	13 (17.8)	01 (1.4)	59 (80.8)
No	182 (52.3)	24 (13.2)	09 (5)	149 (81.9)
Uncertain	97 (27.6)	10 (10.3)	05 (5.2)	82 (84.5)

* - The percentage do not add up to 100% because one respondent can mention more than one reason.

it is not their responsibility to take part in smoking cessation activities.

Most of the students (n=254, 72.2%) had a positive attitude to the role of the pharmacists in smoking cessation programs. Moreover, they thought that smoking cessation is an important service for the pharmacist to provide. However, they had low level of confidence in the ability of the pharmacist to provide smoking cessation advice or counseling because of the lack of academic education plans to help the pharmacist to provide such services. In addition, they thought that the pharmacist and teachers should set a good example by not smoking. In this respect, 80% of the students thought that pharmacist as a part of a health-care team should be responsible to set a good example by not smoking. Whereas, 47.7% thought that the benefit of smokers from counseling would be minimal if the smokers realized that the pharmacist himself is a smoker and 21.3% of the students thought that no action should be taken against pharmacists who smoke. In contrast, 12.8% of the students thought it was entirely their own business whether they smoked or not. An overwhelming number of students agreed or strongly agreed on the addition of tobacco issues to the pharmacy curriculum.

In our study, the prevalence rate of the current smokers among male students is 13.4%. Moreover, this low prevalence rate of smoking among the students compared with that of the community pharmacists (19.9%) shown in another study conducted in Riyadh⁴ suggests that the next generation of pharmacists may be able to fulfill the exemplary role of non-smoking behavior.

The results of the study also revealed that relaxation with friends was the main reason for starting smoking. These findings being similar to those reported in other studies.⁵ Similarly, the presence of family members who smoke may be considered as an important factor as adolescents start to exercise what the elderly are doing.

Although, the majority of the students praised the role of the pharmacist in advising and helping smokers to quit, the picture seemed gloomy in this

respect, in the light of inadequacy in the preparation of the student to face such situations later. Therefore, for the health professionals to take an active role in advising and helping smokers to quit, they must be better educated and trained in both the hazards of active and passive smoking and in smoking cessation techniques. Also, antismoking programs need to be tailored for university students to teach and counsel students on ways of coping with their problems. Likewise, greater emphasis on antismoking programs for schoolchildren including the primary education level is highly demanded. There is an urgent need for public health efforts to decrease the rate of cigarette smoking by promoting legislation to restrict selling cigarettes to the youngsters, as well as fining those who violate banning smoking. Furthermore, the pharmacy schools should be encouraged to include teaching tobacco issues in their curricula, and teachers and pharmacists should present non-smoking models by not smoking.

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