4.3.4.5 *Breathing and ventilation* C5_1 to C5_17; D5_1 to D5_17

This question will be analysed in five parts because the actions are related to each other, and to simplify the figures.

a) *Part 1* C5_1 to C5_4; D5_1 to D5_4

Part 1 provides the results and analysis of performance of four skills pertaining to breathing and ventilation: initiate appropriate oxygen therapy, nebulisation therapy, bag-valve-mask ventilation and anaesthesia bag ventilation. Figures 4.37 and 4.38 illustrate the skills visually by indicating the mean score for each variable.

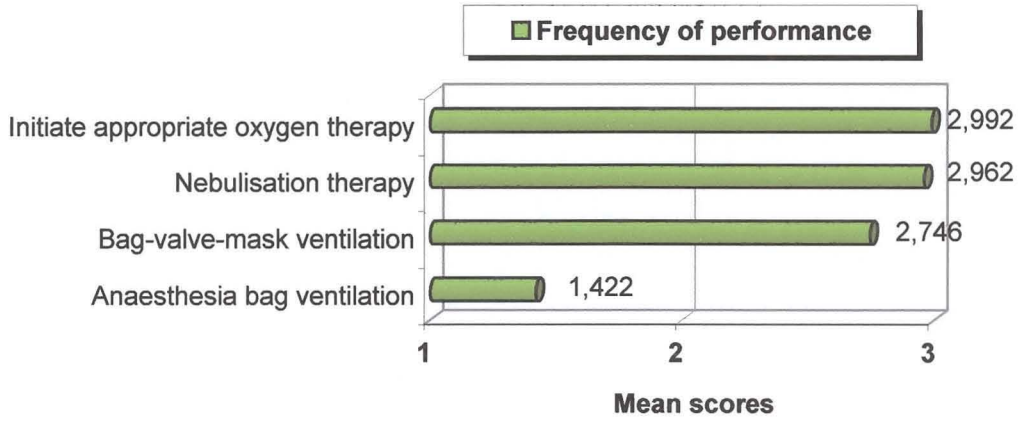

Figure 4.37 - Breathing and ventilation (Part 1)

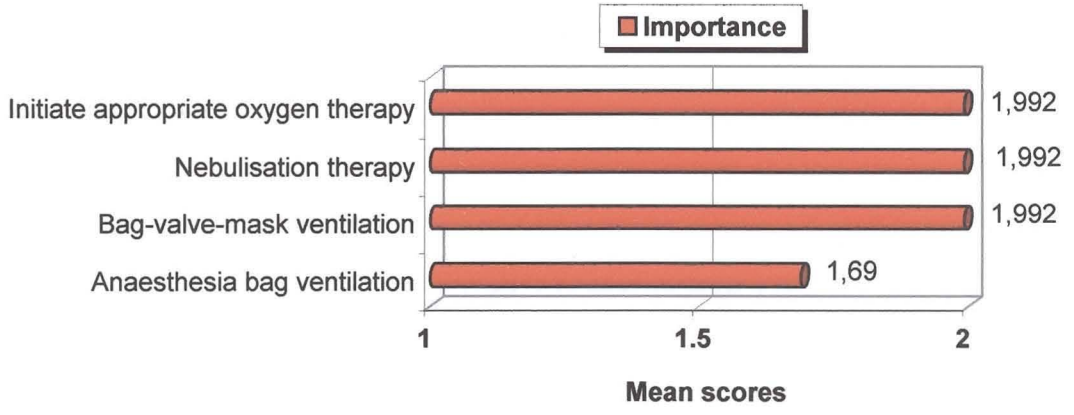

Figure 4.38 - Breathing and ventilation (Part 1)

Table 4.17 reflects the *frequency of performance* of advanced life-support skills pertaining to breathing and ventilation. Note that the majority of the respondents indicated that they perform the skills oxygen therapy, nebulisation therapy and bag-valve-mask ventilation frequently. However, the respondents indicated that the anaesthesia bag ventilation is used seldom/never (75,8%).

Table 4.18 reflects the *importance* of these skills to be included in the curriculum and the majority of the respondents indicated that they agree that these skills are important and should be included in the curriculum. Regarding anaesthesia bag ventilation the respondents indicated to a lesser extent (68,9%) that the skills should be included in the curriculum.

b) Part 2 C5_5 to C5_63; D5_5 to D5_63

Part 2 provides the results and analysis of performance of four skills pertaining to breathing and ventilation: confirmation of proper advanced airway placement, peripheral saturation monitoring, arterial blood gas monitoring and exhaled end-tidal CO_2 monitoring.

Figures 4.39 and 4.40 illustrate the skills visually by indicating the mean score for each variable.

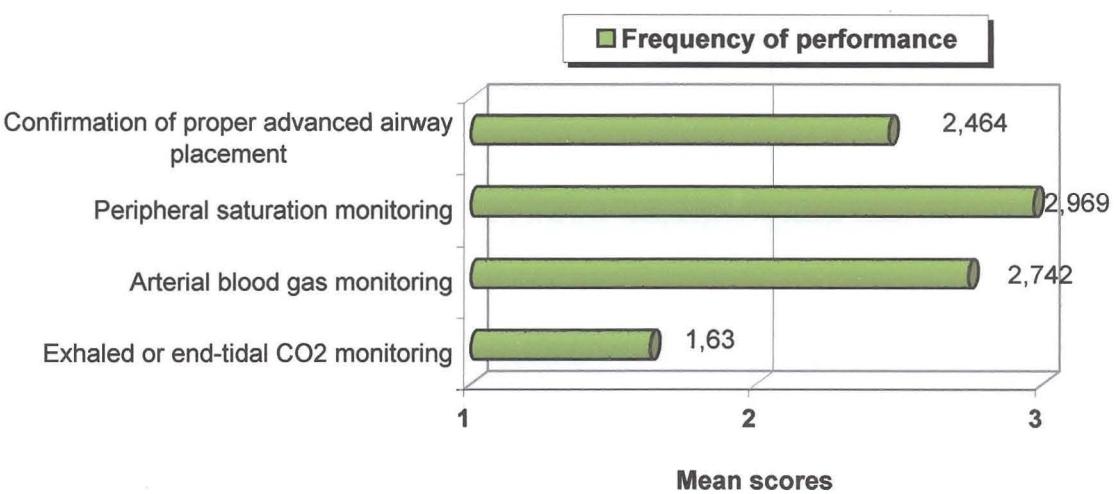

Figure 4.39 - Breathing and ventilation (Part 2)

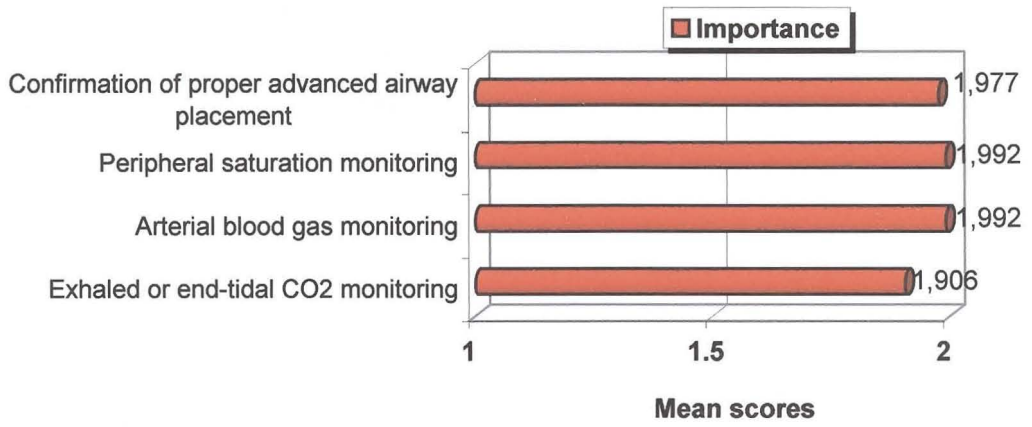

Figure 4.40 - Breathing and ventilation (Part 2)

Table 4.17 reflects the *frequency of performance* of advanced life-support skills pertaining to breathing and ventilation. Note that the majority of the respondents indicated that they frequently perform proper advanced airway placement, peripheral saturation monitoring and arterial blood gas monitoring. However, the majority of the respondents reported that the skill exhaled end-tidal CO_2 monitoring was performed seldom/never (63,4%).

Table 4.18 reflects the *importance* of these skills to be included in the curriculum and the majority of respondents indicated that they agree that these skills are important and should be included in the curriculum.

c) *Part 3* *C5_64 to C5_9; D5_64 to D5_9*

Part 3 provides the results and analysis of performance of four skills pertaining to breathing and ventilation: peak inspiratory flow monitoring, non-invasive mechanical ventilation, mechanical ventilation and drawing an arterial blood gas sample.

Figures 4.41 and 4.42 illustrate the skills visually by indicating the mean scores for each variable.

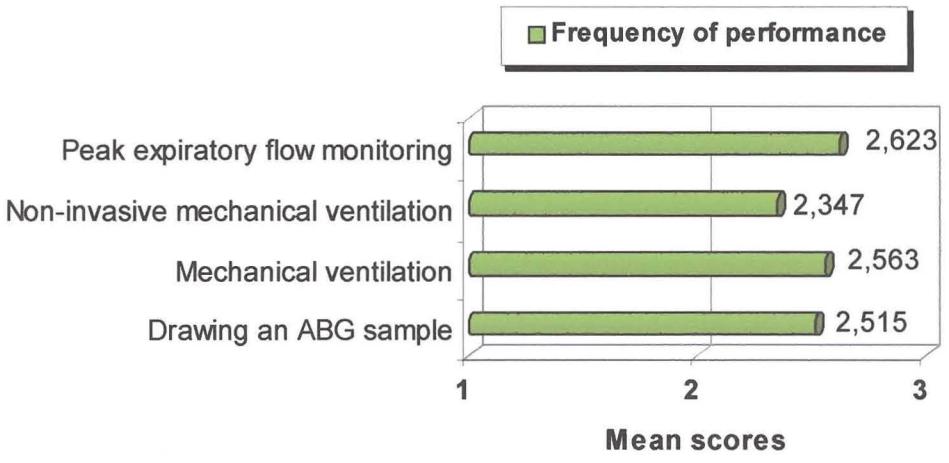

Figure 4.41- Breathing and ventilation (Part 3)

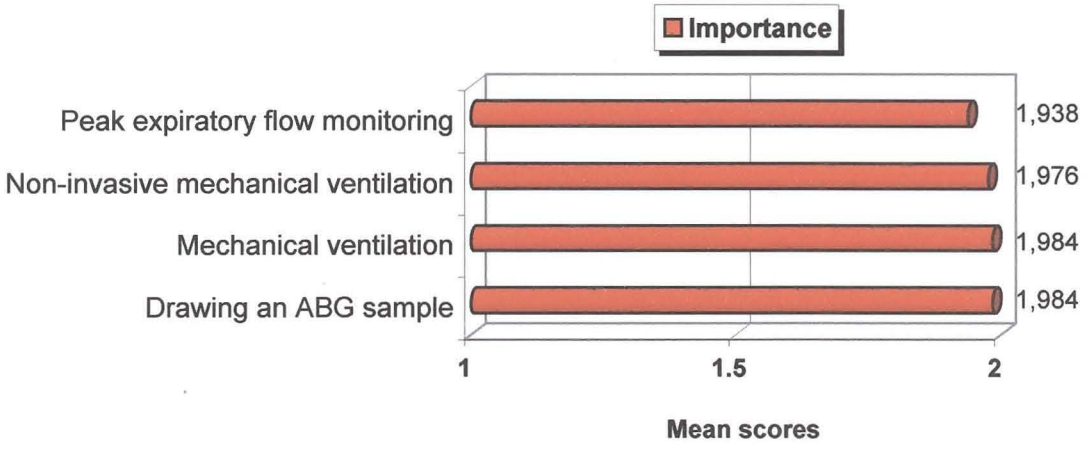

Figure 4.42 - Breathing and ventilation (Part 3)

Table 4.17 reflects the *frequency of performance* of advanced life-support skills pertaining to breathing and ventilation. Note that the majority of the respondents indicated that they frequently perform the skills.

Table 4.18 reflects the *importance* of these skills to be included in the curriculum and the majority of the respondents indicated that they agree that these skills are important and should be included in the curriculum.

d) Part 4 C5_10 to C5_13; D5_10 to D5_13

Part 4 provides the results and analysis of performance of four skills pertaining to breathing and ventilation: interpretation of arterial blood gas, manipulation of treatment according to arterial blood gas results, occlusive dressing for open pneumothorax and emergency needle decompression of tension pneumothorax. Figures 4.43 and 4.44 illustrate the skills visually by indicating the mean score for each variable.

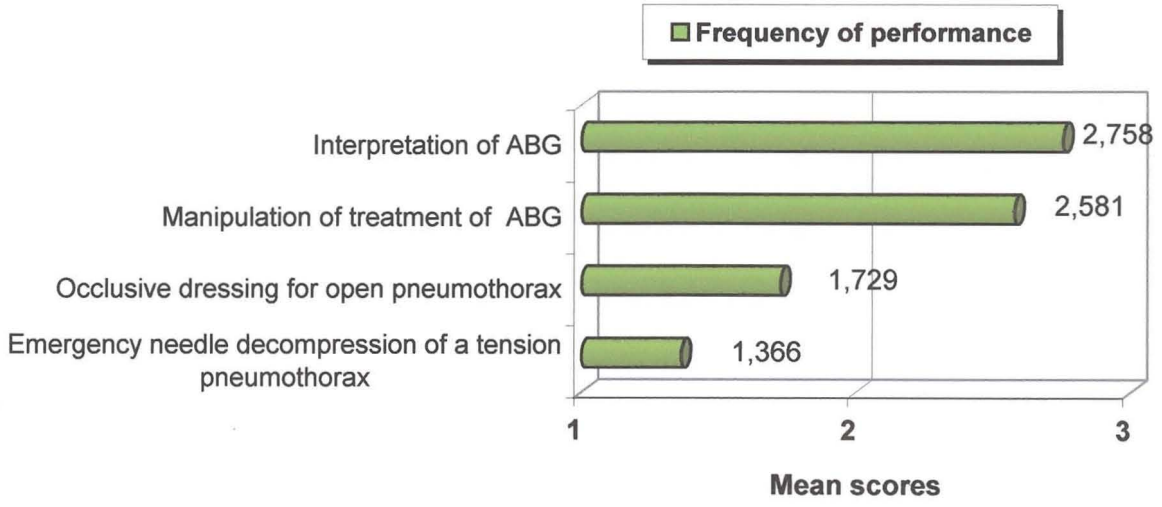

Figure 4.43 – Breathing and ventilation (Part 4)

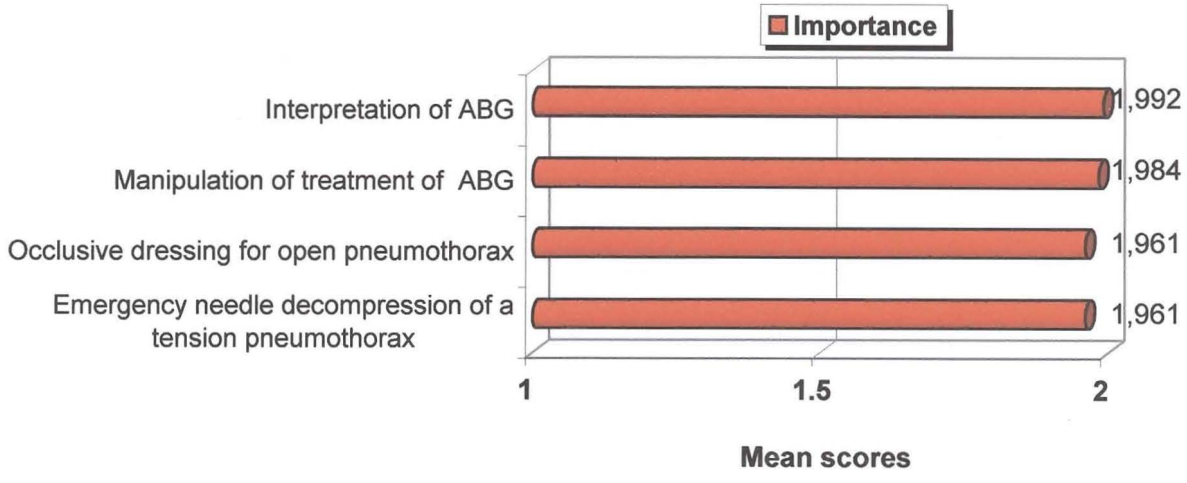

Figure 4.44 - Breathing and ventilation (Part 4)

Table 4.17 reflects the *frequency of performance* of advanced life-support skills pertaining to breathing and ventilation. Note that the majority of the respondents indicated that they frequently perform interpretation of arterial blood gas and manipulation of treatment according to arterial blood gas results. However, the majority of the respondents indicated that they perform occlusive dressing for open pneumothorax and emergency needle decompression seldom/never – this skill was also indicated to be performed periodically (26,4%) and frequently (24,0%). Decompression of tension pneumothorax was used seldom/never (74,8%).

Table 4.18 reflects the *importance* of these skills to be included in the curriculum and the majority of the respondents indicated that they agree that these skills are important and should be included in the curriculum.

e) Part 5 C5_14 to C5_17; D5_14 to D5_17

Part 5 provides the results and analysis of performance of four skills pertaining to breathing and ventilation: emergency placement of an underwater drain for treatment of a tension pneumothorax, emergency placement of an underwater drain for treatment of a pneumo and/or haemothorax, chest drainage system management and chest X-ray interpretation.

Figures 4.45 and 4.46 illustrate the skills visually by indicating the mean score for each variable.

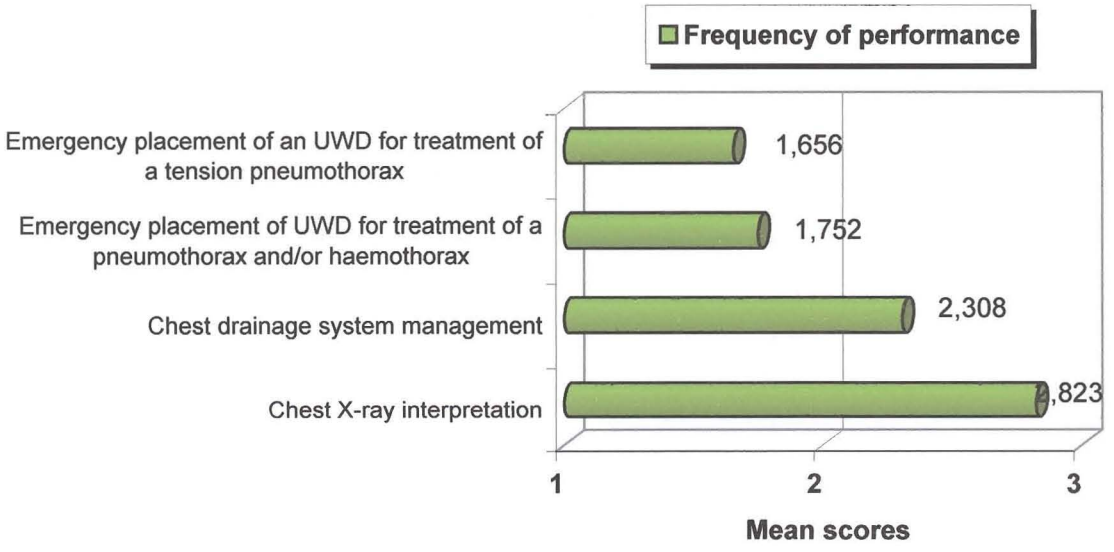

Figure 4.45 - Breathing and ventilation (Part 5)

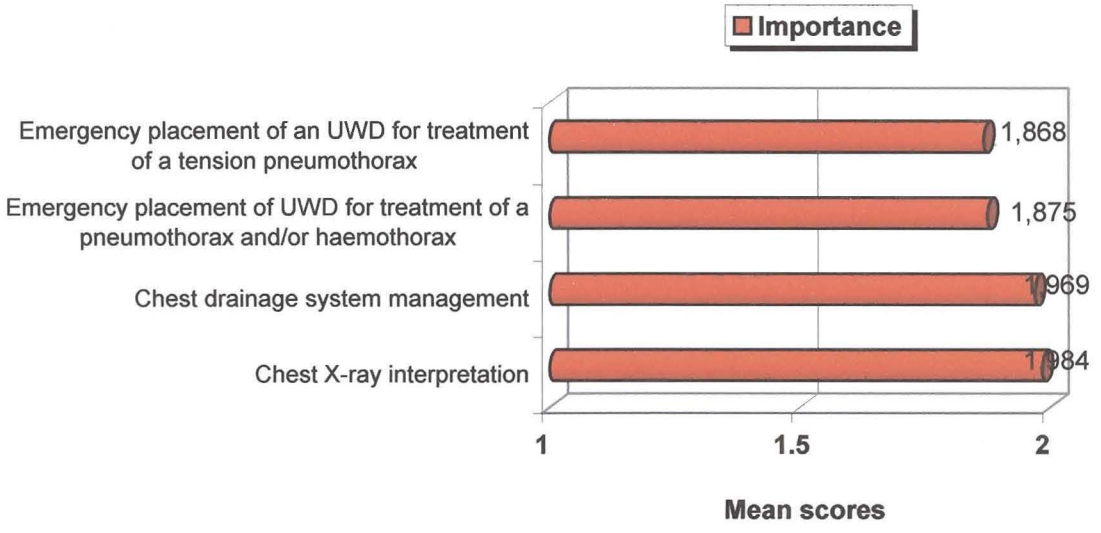

Figure 4.46 - Breathing and ventilation (Part 5)

Table 4.17 reflects the *frequency of performance* of advanced life-support skills pertaining to breathing and ventilation. Note that the majority of the respondents indicated that they perform emergency placement of an underwater drain for treatment of a tension pneumothorax seldom/never (59,1%), although 25,2% indicated that they frequently perform this skill. The majority of the respondents also indicated that they perform emergency placement of an underwater drain for treatment of a pneumothorax and/or haemothorax seldom/never (54,4%), although 30,4% indicated that they frequently perform this skill. Regarding chest drainage system management and chest X-ray interpretation the majority of the respondents indicated that they frequently perform these skills.

Table 4.18 reflects the *importance* of these skills to be included in the curriculum and the majority of respondents indicated that they agree that these skills are important and should be included in the curriculum.

The degree of relationship between the frequency of performance and importance of the skills to be included in the curriculum as indicated by the Spearman correlation (see Annexure D – Spearman correlation between the variables in Section C and Section D) illustrated the following:

- Initiate appropriate oxygen therapy indicated a highly significant Spearman correlation coefficient (r_s 0,296)
- Bag-valve-mask ventilation indicated a significant Spearman correlation coefficient (r_s 0,190)
- Anaesthesia bag ventilation indicated a highly significant Spearman correlation coefficient (r_s 0,458)
- Confirmation of proper advanced airway placement indicated a highly significant Spearman correlation coefficient (r_s 0,383)
- Peripheral saturation monitoring indicated a highly significant Spearman correlation coefficient (r_s 0,316)
- Arterial blood gas monitoring indicated a highly significant Spearman correlation coefficient (r_s 0,304)
- Exhaled or end-tidal CO_2 monitoring indicated a highly significant Spearman correlation coefficient (r_s 0,412)

- Peak expiratory flow monitoring indicated a highly significant Spearman correlation coefficient (r_s 0,347)
- Non-invasive mechanical ventilation indicated a highly significant Spearman correlation coefficient (r_s 0,250)
- Mechanical ventilation indicated a highly significant Spearman correlation coefficient (r_s 0240)
- Drawing an arterial blood gas sample indicated a significant Spearman correlation coefficient (r_s 0,192)
- Interpretation of arterial blood gas indicated a significant Spearman correlation coefficient (r_s 0,198)
- Manipulation of treatment according to arterial blood gas indicated a highly significant Spearman correlation coefficient (r_s 0,343)
- Occlusive dressing for open pneumothorax indicated a highly significant Spearman correlation coefficient (r_s 0,230)
- Emergency placement of an underwater drain for treatment of a tension pneumothorax indicated a highly significant Spearman correlation coefficient (r_s 0,323)
- Emergency placement of an underwater drain for treatment of a pneumothorax and/or haemothorax indicated a highly significant Spearman correlation coefficient (r_s 0,359)

Table 4.17 – Frequency of performance of advanced life-support skills (%) C5_1 to C5_17

Skills	State hospitals						Private hospitals						Total						X^2	df†
	Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Breathing and circulation																				
Part 1																				
Initiate appropriate oxygen therapy	0	0,0	0	0,0	32	100,0	0	0,0	0	0,0	95	100,0	0	0,0	0	0,0	127	100,0	0,000	0
Nebulisation therapy	0	0,0	0	0.0	32	100,0	1	1,1	2	2,1	92	96,8	1	0,8	2	1,6	124	97,6	1,035	2
Bag-valve-mask ventilation	1	3,1	3	9,4	28	87,5	4	4,3	19	20,2	71	75,5	5	4,0	22	17,5	99	78,6	2,118	2
Anaesthesia bag ventilation (Boyles machine)	22	68,8	1	3,1	9	28,1	72	78,3	7	7,6	13	14,1	94	75,8	8	6,5	22	17,7	3,644	2

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.17 – (continued)

Skills	State hospitals						Private hospitals						Total						X^2	df†
	Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Part 2																				
Confirmation of proper advanced airway placement	10	33,3	5	16,7	15	50,0	12	13,2	16	17,6	63	69,2	22	18,2	21	17,4	78	64,5	6,342*	2
Oxygenation and ventilation monitoring																				
Peripheral saturation monitoring	0	0,0	0	0,0	30	100,0	1	1,1	1	1,1	93	97,9	1	0,8	1	0,8	123	98,4	0,642	2
Arterial blood gas (ABG) monitoring	1	3,2	4	12,9	26	83,9	5	5,4	16	17,2	72	77,4	6	4,8	20	16,1	98	79,0	0,611	2
Exhaled or end-tidal CO_2 monitoring (capnograph)	22	71,0	3	9,7	6	19,4	56	60,9	10	10,9	26	28,3	78	63,4	13	10,6	32	26,0	1,111	2

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.17 – (continued)

Skills	State hospitals						Private hospitals						Total						X^2	df†
	Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Part 3																				
Peak inspiratory flow monitoring (e.g. asthma patients)	6	19,4	2	6,5	23	74,2	10	10,5	13	13,7	72	75,8	16	12,7	15	11,9	95	75,4	2,470	2
Non-invasive mechanical ventilation	7	23,3	5	16,7	18	60,0	19	21,1	20	22,2	51	56,7	26	21,7	25	20,8	69	57,5	0,428	2
Mechanical ventilation	2	6,3	10	31,3	20	62,5	11	12,0	19	20,7	62	67,4	13	10,5	29	23,4	82	66,1	1,964	2
Drawing an arterial blood gas (ABG) sample	2	6,5	4	12,9	25	80,7	17	17,9	20	21,1	58	61,1	19	15,1	24	19,1	83	65,9	4,207	2

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.17 – (continued)

Skills	State hospitals						Private hospitals						Total						X^2	df†
	Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Part 4																				
Interpretation of arterial blood gas (ABG)	1	3,0	3	9,1	29	87,9	5	5,3	16	16,8	74	77,9	6	4,7	19	14,8	103	80,5	1,555	2
Manipulation of treatment according to arterial blood gas (ABG)	2	6,5	6	19,4	23	74,2	13	13,8	16	17,0	65	69,2	15	12,0	22	17,6	88	70,4	1,214	2
Occlusive dressing for open pneumothorax (tape only three sides)	14	43,8	8	25,0	10	31,3	48	51,6	25	26,9	20	21,5	62	49,6	33	26,4	30	24,0	1,271	2
Emergency needle decompression of tension pneumothorax	24	75,0	3	9,4	5	15,6	71	74,7	14	14,7	10	10,5	95	74,8	17	13,4	15	11,8	1,041	2

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.17 – (continued)

Skills	State hospitals						Private hospitals						Total						X^2	df†
	Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently		Seldom / Never		Periodically		Frequently			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Part 5																				
Emergency placement of an underwater drain for treatment of a tension pneumotho-rax	20	62,5	4	12,5	8	25,0	55	57,9	16	16,8	24	25,3	75	59,1	20	15,8	32	25,2	0,373	2
Emergency placement of an underwater drain for treatment of a pneumo-thorax and/or haemothorax	19	59,4	3	9,4	10	31,3	49	52,7	16	17,2	28	30,1	68	54,4	19	15,2	38	30,4	1,166	2
Chest drai-nage system management	6	18,2	7	21,2	20	60,6	19	20,4	32	34,4	42	45,2	25	19,8	39	31,0	62	49,2	2,613	2
Chest X-ray interpretation		12,1		12,1		75,8		2,2		6,5		91,4	6	4,8	10	7,9	110	87,3	6,754	2

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.18 – Importance of advanced life-support skills (%) D5_1 to D5_17

Skills	State hospitals				Private hospitals				Total				X^2	df†
	Disagree		Agree		Disagree		Agree		Disagree		Agree			
	N	%	N	%	N	%	N	%	N	%	N	%		
Breathing and ventilation														
Part 1														
Initiate appropriate oxygen therapy	1	3,2	30	96,8	0	0,0	94	100,0	1	0,8	124	99,2	3,057	1
Nebulisation therapy	1	3,2	30	96,8	0	0,0	94	100,0	1	0,8	124	99,2	3,057	1
Bag-valve-mask ventilation	1	3,2	30	96,8	0	0,0	94	100,0	1	0,8	124	99,2	3,057	1
Anaesthesia bag ventilation (Boyles machine)	8	27,6	21	72,4	30	32,3	63	67,7	38	31,2	84	68,9	0,225	1
Part 2														
Confirmation of proper advanced airway placement	1	3,3	29	96,7	2	2,1	92	97,9	3	2,4	121	97,6	0,140	1
Oxygenation and ventilation monitoring														
Peripheral saturation monitoring	1	3,2	30	96,8	0	0,0	94	100,0	1	0,8	124	99,2	3,057	1
Arterial blood gas (ABG) monitoring	0	0,0	31	100,0	1	1,1	93	98,9	1	0,8	124	99,2	0,332	1
Exhaled or end-tidal CO_2 monitoring (capnograph)	4	12,9	27	87,1	8	8,6	85	91,4	12	9,7	112	90,3	0,492	1

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.18 – (continued)

Skills	State hospitals				Private hospitals				Total				X^2	df†
	Disagree		Agree		Disagree		Agree		Disagree		Agree			
	N	%	N	%	N	%	N	%	N	%	N	%		
Part 3														
Peak inspiratory flow monitoring (e.g.aAsthma patients)	5	16,1	26	83,9	3	3,2	91	96,8	8	6,4	117	93,6	6,514	1
Non-invasive mechanical ventilation	1	3,2	30	96,8	2	2,2	90	97,8	3	2,4	120	97,6	0,108	1
Mechanical ventilation	1	3,2	30	96,8	1	1,1	92	98,9	2	1,6	122	98,4	0,678	1
Drawing an arterial blood gas (ABG) sample	1	3,2	30	96,8	1	1,1	91	98,9	2	1,6	121	98,4	0,663	1
Part 4														
Interpretation of arterial blood gas (ABG)	1	3,2	30	96,8	0	0,0	94	100,0	1	0,8	124	99,2	3,057	1
Manipulation of treatment according to arterial blood gas (ABG)	1	3,2	30	96,8	1	1,1	93	98,9	2	1,6	123	98,4	0,692	1
Occlusive dressing for open pneumothorax (tape only three sides)	2	6,5	29	93,6	3	3,2	90	96,8	5	4,0	119	96,0	0,625	1
Emergency needle decompression of tension pneumothorax	4	12,9	27	87,1	1	1,1	93	98,9	5	4,0	120	96,0	8,510	1

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$

Table 4.18 – (continued)

Skills	State hospitals				Private hospitals				Total				χ^2	df†
	Disagree		Agree		Disagree		Agree		Disagree		Agree			
	N	%	N	%	N	%	N	%	N	%	N	%		
Part 5														
Emergency placement of an underwater drain for treatment of a tension pneumothorax	5	16,1	26	83,9	11	11,7	83	88,3	16	12,8	109	87,2	0,409	1
Emergency placement of an underwater drain for treatment of a pneumothorax and/or haemothorax	5	16,1	26	83,9	10	10,8	83	89,3	15	12,1	109	87,9	0,632	1
Chest drainage system management	2	6,5	29	93,6	2	2,1	92	97,9	4	3,2	121	96,8	1,407	1
Chest X-ray interpretation	1	3,2	30	96,8	1	1,1	93	98,9	2	1,6	123	98,4	0,692	1

† Degrees of freedom
* $p < 0,05$
** $p < 0,01$