The attitudes, concerns, gloving practices and knowledge of nurses in a Taiwanese hospital regarding AIDS and HIV

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Many studies have documented nurses’ attitudes and concerns regarding AIDS/HIV, but little is known about Taiwanese nurses. We documented attitudes, concerns, gloving practices and practical AIDS/HIV knowledge of 1090 nurses from one metropolitan hospital in Changhua City, Taiwan. The response rate was 80.9%. Both HIV and hepatitis contraction in the workplace was nurses’ main concern. Two hundred and ten nurses (19.3%) were seriously considering leaving nursing because of fear of contracting AIDS/HIV. Virtually all nurses considered it their right to be informed of the presence of HIV-positive patients in their direct work area and many believed that HIV testing of patients should be mandatory. Practical AIDS/HIV knowledge was deficient. These Taiwanese nurses have concerns and fears that might be related to deficiencies in practical AIDS/HIV knowledge. Continuous educational programmes are recommended to alleviate these nurses’ attitudes and concerns regarding AIDS/HIV.

Key words: AIDS, attitudes, concerns, HIV, Taiwan.

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INTRODUCTION
Nurses are the largest paramedical professional group caring for patients with acquired immunodeficiency syndrome (AIDS), caused by infection with the human immunodeficiency virus (HIV). As a result of the initial high prevalence of AIDS among homosexual men and intravenous drug users, society in general, and also health care workers, have been prejudiced against those with AIDS or infected with HIV. There is a substantial number of published studies regarding health care workers’ (doctors, nurses and laboratory staff) negative attitudes and concerns regarding AIDS/HIV. However, most of those studies have been carried out in the westernized world.

Ministry of Health statistics show that in 2001 there were 3538 HIV-positive people and 1149 AIDS cases in Taiwan. In common with the rest of the world, these numbers are set to rise. Little has been published regarding Taiwanese nurses’ attitudes and concerns regarding AIDS/HIV. In one recent study, it was found that Taiwanese nurses’ attitudes about giving care to HIV-positive patients generally was negative and that they lacked knowledge regarding HIV infection in the workplace. In another study, Taiwanese nurses demonstrated less fear of AIDS if they had a higher level of education. Therefore, it seems plausible that a lack of AIDS/HIV knowledge impacts on Taiwanese nurses’ attitudes, concerns and work practices in relation to AIDS/HIV.

The purpose of this study was: (i) to ascertain Taiwanese nurses’ attitudes, concerns and workplace practices in dealing with HIV-positive biological fluids; (ii) to determine if these attitudes and concerns were inter-related; and (iii) to determine nurses’ practical AIDS and HIV knowledge. The results of this study might be of use in devising appropriate educational programmes for nurses to alleviate their anxiety about caring for AIDS and HIV-positive patients.

METHODS
We used a questionnaire previously employed by one of the authors in studies of health care workers (nurses and laboratory staff) in New Zealand to ascertain AIDS/HIV knowledge, attitudes, concerns and workplace practices in dealing with HIV-positive biological fluids. The questionnaire was based on a statistically validated questionnaire used to determine the relationship between knowledge, attitudes and degree of contact with AIDS of nurses in Great Britain.

The questionnaire consisted of five sections. The first section asked for demographic data regarding age, professional training and education, years of work experience, primary medical area of work, and whether the nurse had recently attended an AIDS/HIV workshop or lecture. The second section ascertained whether the nurse wore gloves when handling a variety of biological specimens through a categorical yes, no or sometimes answer. The third section asked for the nurse’s response to a variety of concerns regarding handling of biological specimens. The fourth section presented four statements with five possible responses ranging from ‘strongly agree’ to ‘strongly disagree’. The final section tested the nurse’s knowledge of in which biological fluids HIV can be detected and methods of destroying HIV outside the human body.

The questionnaire was translated into Chinese and distributed to all medical departments employing nurses in the Changhua Christian Hospital in Changhua City, a general metropolitan hospital of 1696 beds. The team leader and manager in each medical department explained the purpose of the study and the questionnaire was answered by self-administration. Participation in the study was voluntary and no information regarding the nurse’s identity was solicited, thus assuring the confidential nature of participation. Ethical permission for the study was obtained and approved by the hospital’s ethics committee. The questionnaire was distributed in November 2001 and returns collected over the next two months.

Data from the returned and completed questionnaires were entered onto a database. Distinct response rates to questions are presented as proportions and analysed by Pearson’s chi-square test or Fisher’s exact test where appropriate. A P-value of < 0.05 was deemed statistically significant.

RESULTS
From a total workforce of 1348 nurses, 1090 nurses answered and returned the questionnaire, giving a response rate of 80.9%. Respondents were predominantly female (99.5%) with an age range of 20–60 years. Enrolled and staff nurses made up 86% of the respondents, charge nurses and nurse managers the remaining 14%. Three nurses had a postgraduate degree, 169 (15.5%) had a Bachelor’s degree, 896 (82.2%) had attended Junior College while 22 (2.0%) had Vocational School training. Three hundred and fifty-seven nurses (32.8%) had attended an AIDS workshop or lecture in the preceding 12 months. Table 1 presents
the respondents’ medical work area and years of work experience.

The nurses were asked whether they wear gloves when dealing with a variety of body fluids and biological samples. Table 2 summarizes their responses regarding gloving practices. Numbers of responses do not add up to total respondents \((n = 1090)\) as a small percentage of respondents left some of the categories unanswered. The majority of nurses (76.3–89.4%) always wore gloves when handling a variety of body fluids or biological samples.

Both HIV and hepatitis were the nurses’ main concern in regard to contracting infections in the workplace (90.8%), 4.7% were only concerned about HIV, 1.2% were concerned only about hepatitis while 3.3% were not concerned about either. Despite their concern of contracting HIV in the workplace, only 58% of nurses treated all biological specimens as potentially HIV-positive. However, 59.2% of nurses treating all biological specimens as potentially HIV-positive were concerned about contracting HIV in the workplace \((P = 0.007)\).

A total of 604 (55.4%) nurses responded in the affirmative when asked whether they had family members or friends express serious concern regarding their work in relation to AIDS/HIV. Of the nurses responding in the affirmative, 589 (56.6%) were concerned about acquiring HIV in the workplace compared to 451 (43.4%) responding in the negative \((P = 0.001)\).

Four hundred and sixty-two (42.4%) nurses had previously treated or cared for an HIV-positive patient or a patient with AIDS. The majority (95.5%) of these nurses were concerned about acquiring HIV in the workplace. However, this was similar to nurses who had not previously treated AIDS or HIV-positive patients (95.7%; \(P = 0.85\)).

The nurses were asked whether they were seriously considering leaving the job because of concerns of acquiring HIV infection or AIDS through handling of biological specimens. Two hundred and ten (19.3%) nurses indicated they were, 485 (44.5%) were not, while 393 (36.1%) were uncertain. The overwhelming majority \((n = 206)\) of the nurses indicating that they were seriously considering leaving their job were concerned about acquiring HIV in the workplace. This was also the case for 381 out of the 393 nurses who were uncertain.

<table>
<thead>
<tr>
<th>Work area</th>
<th>1–6 years</th>
<th>7–12 years</th>
<th>13–18 years</th>
<th>&gt;18 years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal medicine</td>
<td>229</td>
<td>36</td>
<td>15</td>
<td>4</td>
<td>284</td>
</tr>
<tr>
<td>Surgery</td>
<td>307</td>
<td>45</td>
<td>12</td>
<td>6</td>
<td>370</td>
</tr>
<tr>
<td>Gynaecology</td>
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<td>11</td>
<td>6</td>
<td>0</td>
<td>64</td>
</tr>
<tr>
<td>Paediatrics</td>
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<td>30</td>
<td>2</td>
<td>5</td>
<td>148</td>
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<tr>
<td>Emergency medicine</td>
<td>121</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>135</td>
</tr>
<tr>
<td>Outpatients</td>
<td>19</td>
<td>18</td>
<td>9</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>20</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Home care</td>
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<td>4</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>856</td>
<td>156</td>
<td>50</td>
<td>28</td>
<td>1090</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Blood</th>
<th>Urine</th>
<th>Faeces</th>
<th>Sputum</th>
<th>Wound drainage</th>
<th>Tissues</th>
<th>Semen or vaginal discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>832</td>
<td>862</td>
<td>929</td>
<td>876</td>
<td>971</td>
<td>958</td>
<td>974</td>
</tr>
<tr>
<td>Sometimes</td>
<td>246</td>
<td>208</td>
<td>147</td>
<td>195</td>
<td>109</td>
<td>119</td>
<td>89</td>
</tr>
<tr>
<td>Never</td>
<td>12</td>
<td>19</td>
<td>12</td>
<td>16</td>
<td>8</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>
Taiwanese nurses and HIV/AIDS

three (8.5%) respondents would not have embarked on a nursing career if they had prior knowledge that they could potentially be handling HIV-positive biological samples in their job.

The nurses were asked to respond to four statements regarding their employer’s provision of safety measures and education regarding AIDS/HIV, and their own beliefs whether all admitted patients should be tested for HIV and if they should be informed if an HIV-positive patient is in their work area. Responses to these statements were recorded on a 5-point Likert-type scale ranging from ‘strongly agree’ to ‘strongly disagree’. The majority of nurses were happy with their employer’s provision of safety measures and AIDS/HIV education (95.6% and 86.3%, respectively). Virtually all of the respondents (98.8%) considered it their right to be informed if an AIDS or HIV-positive patient is present in their direct work area, while 76.4% of the respondents believed all patients presenting to the hospital should be tested for HIV. The responses to these four statements are presented in Table 3.

The nurses were tested on their knowledge of in which biological fluids and specimens HIV has been detected. Thirteen biological specimens were presented. Of these, HIV has not previously been detected in sweat, smoke and air. The mean correct score was 71.6% (95% confidence interval, CI: 70.6–72.6). Correct/incorrect responses to each of the biological specimens are presented in Table 4.

Finally, the nurses were tested on their knowledge of methods known to be effective in destroying HIV outside the body. Four methods (boiling, bleach, soap and detergent) known to destroy HIV plus one method (freezing) known not to destroy HIV were presented. The mean correct score was 48.8% (95% CI: 47.5–50.1). Correct/incorrect responses are presented in Table 5.

**DISCUSSION**

The results of this study demonstrate that these Taiwanese nurses have many concerns regarding AIDS/HIV that might impact on their attitudes, and that their practical AIDS/HIV knowledge is not optimal. Nurses are the largest paramedical professional group and are directly involved in the care of AIDS and HIV-positive patients. Fear and anxiety, related to ignorance or lack of knowl-
edge, might contribute to nurses’ attitudes and concerns when caring for AIDS/HIV patients. For instance, nurses in Singapore fear treating AIDS/HIV patients, which was significantly and negatively associated with their knowledge of HIV transmission modes and universal precautions.\textsuperscript{9} The authors of this study concluded that it would be more effective to address misconceptions regarding HIV transmission and universal precautions in order to reduce nurses’ fears of treating AIDS patients.

Institution of appropriate AIDS/HIV educational programmes has the potential to change nurses’ attitudes. For instance, after a four-month intensive education on AIDS and care of AIDS patients as part of an epidemiology course in a Bachelor of Nursing programme in Canada, nurses’ attitudes towards AIDS and caring for AIDS patients had become significantly more positive.\textsuperscript{10} In this study, there was a significant decline (from 83\% to 57\%) in nursing students expressing concerns regarding treating AIDS patients. Furthermore, there was a significant decline (from 83\% to 27\%) in students’ belief that they should have the right to choose to work with AIDS patients.

As a result of differing levels of concerns of health care workers, educational programmes have to be tailored to meet the requirements of specific health care groups, such as nurses. Also, a variety of teaching methods might have to be employed. In two such studies, use of multiple method presentations had the greatest effect on changing health professionals’ attitudes towards AIDS and HIV-positive patients.\textsuperscript{11,12} In the first study,\textsuperscript{11} a mixture of experientially based instruction including role play, audiovisual teaching and guest speakers was effective, produced the greatest attitudinal change, and the majority of the students preferred this mixture of education. In the other study,\textsuperscript{12} a mixture of videos, group discussions and hospital experience dealing with AIDS patients showed the greatest decrease in homophobia and contagion fear. This decrease was maintained at three-month follow-up.

More than three-quarters of nurses always wore gloves when dealing with a variety of biological specimens and body fluids. Wearing gloves is a definite requirement at Changhua Hospital. This contrasts to less than half of New Zealand nurses always wearing gloves where this practice is strongly recommended but not an absolute requirement.\textsuperscript{5} Glove wearing does not prevent needle stick injuries but does prevent skin abrasions and cuts being exposed to potentially HIV-infected materials.

Of concern is that more than half (55.4\%) of the nurses had family members or friends expressing serious concern for them working with AIDS and HIV-positive patients. These nurses were more concerned about acquiring HIV in the workplace than nurses whose family or friends were not concerned. This family concern has been observed in other studies. Reader et al. reported that half of nurses’ spouses expressed some degree of concern about their spouses working with AIDS or HIV-positive patients.\textsuperscript{13} Klonoff and Ewers found that having family or friends know that they are caring for AIDS patients was one of two situations deemed most stressful by nurses.\textsuperscript{14} This concern was unrelated to nursing specialty or previous experience in treating AIDS patients. Using an identical question regarding family/friends concerns as in this study, van Wissen and Siebers reported that 31.1\% of New Zealand nurses had family and/or friends being apprehensive.\textsuperscript{6} These concerns have to be taken in account when devising appropriate AIDS/HIV educational programmes.

Nearly 20\% of nurses were seriously considering leaving the profession because of concern of contracting HIV from biological specimens, compared to 2.8\% of New Zealand nurses.\textsuperscript{6} The reason for the low number of nurses seriously considering leaving the profession in New Zealand was probably a reflection of both the economic recession and decline in nursing job vacancies in New Zealand at that time. In one study of Taiwanese nurses’ intention to care for HIV-positive patients, 27 out of 223 (12.1\%) nurses strongly agreed with the statement that they would rather quit their job than care for an HIV-positive patient.\textsuperscript{3} This intention to quit was significantly related to HIV/AIDS knowledge, social attitudes and nursing care attitudes. In another Taiwanese

\begin{table}[h]
\centering
\caption{Knowledge regarding methods of HIV destruction. Number of responses (with percentages in parentheses)}
\begin{tabular}{lcc}
\hline
Method & Correct & Incorrect \\
\hline
Boiling & 486 (44.6) & 594 (54.5) \\
Bleach & 837 (76.9) & 247 (22.7) \\
Soap & 142 (13.0) & 940 (86.2) \\
Freezing & 871 (79.9) & 208 (19.1) \\
Detergent & 320 (29.4) & 762 (69.9) \\
\hline
\end{tabular}
\end{table}

Numbers do not total 1090 as in each category some questions were unanswered.
study, nearly half of nurses who said that they would refuse to care for AIDS patients if asked, indicated they would quit their job if caring for AIDS patients was made compulsory.15

The majority of nurses were satisfied with their employer’s provision of adequate safety measures and AIDS/HIV education. Changhua Hospital has written universal precaution measures, such as requiring staff to wear gloves when taking biological specimens from patients. Furthermore, new nursing staff members have to attend an educational AIDS/HIV lecture upon joining and the local nursing society runs an AIDS/HIV workshop yearly.

Virtually all nurses considered that they had the right to be informed if an AIDS or HIV-positive patient is present in their direct work area while many also want mandatory testing of all patients for HIV. These attitudes and concerns are probably multifactorial in origin. However, health professionals, including nurses, should always observe universal precautions regardless of the infectious nature of the biological specimen. For instance, the risk of contracting hepatitis B is much higher than the risk of contracting HIV through exposure to infected biological specimens. Also, the nurses’ desire for mandatory HIV testing of all patients overrides the right to privacy.

There was a general lack of practical knowledge regarding biological specimens being potentially HIV-positive, and methods of dealing with HIV-positive materials. Although most nurses knew that HIV could be detected in blood products, less than half knew that it could also be detected in faeces and urine. Incredibly, nearly 10% of nurses thought that HIV could be detected in tap water, air or smoke. Many nurses did not know that soap, detergent or boiling are effective mechanisms for destroying HIV outside the body. Nearly 20% also thought that freezing destroys HIV. Other studies from Taiwan have also shown a general lack of AIDS/HIV knowledge.4,15 Yeh et al. suggested that if nurses had better knowledge of workplace risks and protection measures, they would have a more positive attitude and, thus, be more willing to care for AIDS patients.15

There are some limitations to our study. Firstly, the study was from only one hospital and, therefore, the results might not reflect nurses’ attitudes and concerns in other hospitals in Taiwan. However, our results are comparable to results from other Taiwanese studies where more than one hospital was sampled.3,4,15 Secondly, bias of non-responders is always a major concern in cross-sectional studies. We did not determine whether non-responders differed in demographic variables or what were their reasons for not taking part in the study. However, we achieved a response rate of 80.9% and we reasonably assume the results to reflect the majority of nurses at Changhua Hospital. Thirdly, questionnaires often generate biased and preconceived answers. However, in a follow-up study of New Zealand nurses, van Wissen and Woodman, using a qualitative focus group study design to overcome questionnaire problems, also showed that nurses’ AIDS/HIV knowledge levels impacted on their attitudes to AIDS or HIV-positive patients.16 In this study, many nurses felt that their perceived lack of AIDS/HIV knowledge, together with lack of nursing experience, impacted on their confidence in nursing AIDS patients.

In conclusion, our study has shown that Taiwanese nurses from a large metropolitan hospital have many fears and concerns regarding AIDS/HIV. Some of these concerns are unfounded, most likely related to less than adequate practical AIDS/HIV knowledge. Furthermore, because of these concerns and fears, and the concerns of close family or friends, about one-fifth of nurses are seriously considering leaving the profession. Previous studies have shown that appropriate educational intervention programmes are effective in alleviating many of these concerns and in modifying attitudes for the better. Our study results suggest that such programmes would also be of benefit. Ultimately, a well-educated nurse with more positive attitudes and less concerns would be of great benefit for AIDS and HIV-positive patients. The English philosopher Bertrand Russell said in 1950 that ‘Fear is the main source of cruelty. To conquer fear is the beginning of wisdom’.17 It is up to health professionals to conquer unfounded fear of AIDS and HIV for the betterment of the profession and patients.

ACKNOWLEDGEMENT
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